

THE ROLE OF DEMOGRAPHIC AND MONE-
TARY FACTORS IN THE LATE MEDIEVAL
ECONOMIES OF ENGLAND, SCOTLAND AND
THE SOUTHERN LOW COUNTRIES (1351–1530)



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ABSTRACT

The narrative of the post-Black Death English economy has been shaped by two contrasting interpretations: whether England's economy was one of economic decline or prosperity; and whether its economy was largely driven by demographic or monetary factors. These two debates, which both appear to be irreconcilable, are the result of a persistent Anglo-centric approach to the late medieval English economy. My thesis puts the economy of England into the context of Scotland and the southern Low Countries, using comparison to shed new light on these debates. With the addition of both new mint output data from Scotland and annual population estimates for Flanders and Brabant, I employ regression analysis to quantitatively test the extent to which demographic and monetary factors were able to play a determining role in the long-term trends of prices, rents and wages. Thus, my work offers a more rounded approach than previous studies of the impact of money and population on prices, rents and wages. This comparative approach and use of statistical methods offer a number of striking conclusions. First, England's post-Black Death economy was atypical when compared with her trading partners—the currency was unusually stable and the population was unique in its slow recovery. Prices in England remained flatter than elsewhere and appear to have been driven more clearly by demographic factors, though there are caveats to this conclusion. Second, relative to the periods of monetary shortage and undulating prices seen in the southern Low Countries and Scotland, while England's fifteenth-century economy might have lacked the prosperity of the late fourteenth century, it appears to have survived the bullion famine and mid fifteenth-century 'slump' better than elsewhere. England's balance of trade remained positive, and sluggish population recovery after the Black Death kept the per capita money stock buoyant enough to prevent the dramatic price depression seen in the southern Low Countries during the mid-fifteenth century. Such conclusions only manifest themselves through my unique combination of triple comparison and statistical analysis.

LONG ABSTRACT

The narrative of the post-Black Death English economy has been shaped by two contrasting interpretations: whether England's economy was one of economic decline or prosperity; and whether its economy was largely driven by demographic or monetary factors. On the one hand, historians such as Christopher Dyer have argued that the post-Black Death era was one of prosperity for the labouring classes which, at the expense of employers and landlords, brought with it dramatic improvements in living standards. Real wages rose and spending on luxury goods increased. On the other hand, studies of the late medieval English economy have also suggested that the post-Black Death period was one punctuated by major crises. The first is the bullion famine of c.1395–1415, where a lack of silver in Europe was caused by a balance of trade deficit with the East. Though this theory began as a European crisis, it has relentlessly been applied to the English economy. The second major crisis of the post-Black Death era is the so-called mid fifteenth-century 'slump', the main proponent of which is John Hatcher. This crisis came with a general recession caused by a lack of ready money following the decline of England's positive balance of payments in the middle of the fifteenth century. Hatcher also went further in his criticism of post-Black Death economic prosperity and argued that it was not possible for the labouring classes to have made substantial gains in real wages on account of there not being sufficient employment available.

The second big debate in the late medieval economic narrative—whether the economy was driven by demographic or monetary factors—also appears to be irreconcilable. The demographic theory, most famously advocated for by M. M. Postan, predominantly explains price trends by looking at the effects of population change on supply and demand balances. In contrast, the monetary approach is twofold: it examines the implications of both debasements and changes in the availability of money (Quantity Theory) on price levels. Often Quantity Theory relies upon mint output as a proxy for availability of money because, apart from the case of England, there is little in the way of estimates for the circulating quantity of money in most late medieval economies. Though both the monetary and demographic historians accept that there was a certain level of influence from other factors (i.e. Postan's acceptance of 'effective demand'), approaches have tended not to have been very even-handed, with a lot of modern scholarship favouring monetary influences (e.g. John Munro).

These two apparently irreconcilable debates have probably arisen as a result of England's economy commonly being studied in isolation. Comparisons involving England's economy have tended to feature just one other economy. In the case of a double comparison it is impossible to gauge which of the case studies is 'normal' and which is the outlier. My thesis brings a more balanced approach to the study of the late medieval English

economy by constructing a triple comparison. It compares England with Scotland and the southern Low Countries, namely Flanders and Brabant. Aside from a good deal of available data, Scotland and the southern Low Countries were chosen for a number of reasons. First, the geographical proximity of the countries is also beneficial—no economic historian would refute the short-term impact of climate shocks on the general price level, and by comparing countries with similar weather patterns, I reduce the risk of finding dramatic weather-induced price swings that are particular to one country alone. The inclusion of *both* Flanders and Brabant is motivated by a desire to maximise the available data. Given that Flanders is coastal and Brabant is landlocked, I will draw a distinction during the discussion of some specific data because the geographical location of each region could have impacted on its overall price, wage and rent trends. Furthermore, the selection of Scotland is an attempt to make the study of late medieval English history broader and more ‘British’.

The data employed in this thesis is also of greater breadth than seen in other studies. I examine prices, wages *and* rents, the latter of which is frequently neglected by historians of prices and wages. I employ statistical testing to quantify the impact of monetary, demographic and environmental factors. For example, regression analysis allows for the quantifiable effects of demographic and monetary drivers to manifest themselves in the long-term data. I also make use of data previously unavailable to other economic historians who have used similar methods. Combined with broadening the comparison and including a greater breadth of data, this thesis offers a unique insight into the economy of England after the Black Death.

Chapter 1, the introduction to this thesis, offers a detailed examination of the historiographical debates surrounding the post-Black Death English economy, discussing the work that has been done so far. It looks at the finer points of the prosperity/decline debate, and the development of the demographic and monetary theories. It ends by offering a summary of my own approach to the late medieval English economy.

To test strengths and limitations of the demographic and monetary theories, Chapter 2 amasses the necessary data. It begins by demonstrating that England’s currency tended to be valued more highly and with greater stability than those of its trading partners on the international market. The chapter then offers a detailed examination of the debasement policies of England, Scotland and the southern Low Countries, outlining the weights and values of the main gold and silver denominations. This allows for the effect of debasement on prices, rents and wages to be quantitatively tested in later chapters. As the monetary theory also focuses on the quantity of money available, the main estimates for the English money stock are summarised. However, such data is not available for Scotland, Flanders or Brabant and so it is necessary to look at the output of the mints. Other historians have already compiled data for the output of the English, Flemish and

Brabantine mints, but there is no annualised time series for the output of the Scottish mints. Therefore, using the collection of Scottish mint documents compiled by Cochran-Patrick, I construct an annualised time series for Scottish mint output. To examine the validity of Postan's demographic theory, it is also necessary to look at population levels. A number of population estimates have already been offered for England over the years, but the most recent figures from Broadberry *et al.* are used in this thesis. I employ linear interpolation to annualise the figures. There are no annual estimates of the Flemish and Brabantine populations but, using hearth tax data and population growth/decline estimates from van der Wee, I create population benchmarks for Brabant, from which I deduce annual population estimates. There is also reasonable evidence to suggest that the size of the population was similar in Flanders, which leads me to use the same method to provide annual estimates for the Flemish population. Gauging the precise size of the Scottish population is more difficult still and we are forced to rely on a sketch of its shape largely based on inference and qualitative data. From the data available, it appears that England's population recovered far slower than those of Scotland, Flanders and Brabant after the Black Death—in Scotland and the southern Low Countries it seems that population recovery began at the end of the fourteenth century, while the English population did not begin to seriously pick up until the second half of the fifteenth century. Finally, the chapter combines the mint output data and population data for England, Flanders and Brabant to offer per capita money stock estimates for England and per capita mint output estimates for both England and the southern Low Countries. England's per capita money stock appears to have been fairly buoyant throughout the post-Black Death period, and its per capita mint output seems to have worked on a fifty-year cycle, with peaks around the periods of debasement. This is in contrast to the erratic output of the Flemish and Brabantine mints, which convey the impression of constant debasement intended to keep the quantity of money in circulation stable. The most striking conclusion to arise from this chapter is how different England's economic foundations appear when compared with those of Scotland and the southern Low Countries.

Chapter 3 examines how England's unique economic backdrop affected price trends. It first offers an overview of the trends of different commodity prices, drawing together some general observations. It notes that English prices appear to have been fairly flat, or even slightly deflationary throughout the fifteenth century. In contrast, commodity prices in Flanders and Brabant undulated. There were periods of heavy inflation at the end of the fourteenth century, the first quarter of the fifteenth century and at the turn of the sixteenth century. There is a strikingly pronounced period of deflation in the middle of the fifteenth century, dating from around the 1440s to the 1460s. In Scotland, while there was no dramatic inflation at the end of the fifteenth century, it does become clear that the fifteenth century was generally a period of rampant inflation, excepting some

price decline around the middle of the fifteenth century. The chapter then goes on to test the extent to which we can quantitatively accredit demographic, monetary and environmental factors for these trends. Regression analysis finds that, in England, population was the strongest driver of commodity prices. In contrast, debasement was the most important factor for Scotland, Flanders and Brabant. However, debasement was important for English commodities where the goods were heavily involved in trade—such as wool. Mint output played a minor role in English commodity price trends, but its role appears clearly present. For Brabant, mint output played a stronger role on price trends than it did in Flanders. Mint output's role in the Scottish price trends consistently lacks statistical significance, presumably due to relatively scanty data. After establishing that the main climate events in England were also present in Scotland and the southern Low Countries, I use crop yields as a proxy for climate and regress them against the relevant grain prices. Only in the case of wheat is there a strong statistical link between long-term prices and yields/climate. The statistical results show that demographic, monetary and environmental factors cannot explain all the price trends, so I dedicate a section to a discussion of short-term political shocks which might have impacted on prices. The conclusions reached from the analysis of individual commodity prices are then tested against the overall impression gained from baskets of consumables. While the independent variables considered in this chapter cannot explain all the price trends, a number of conclusions have become evident: England's prices were unusually flat and were more strongly driven by demographic than monetary factors. However, this does not truly vindicate Postan because it was seen that monetary factors were not entirely 'neutral'. In Scotland, Flanders and Brabant, debasement was consistently the strongest driver of prices. Most notably, it becomes clear through the triple comparison that England's price trends, when considered in light of its debasement policy, do not seem to reflect a country suffering from a bullion famine or a slump in the middle of the fifteenth century. Indeed, the pronounced price depression seen in the Flemish and Brabantine prices during these periods are more indicative of a country struggling with currency availability. The striking of black money by James III of Scotland also confirms this picture. Thus, while it is possible that England's fifteenth-century economic experience was less prosperous than the boom in the last quarter of the fourteenth century, relative to its trading partners, England appears to have escaped rather lightly.

Chapter 4 examines the extent to which these conclusions also apply to rents and wages. Like most commodity prices, rents in England were either flat or deflationary throughout the post-Black Death period. In Flanders, they appear more inflationary, akin to the commodity price trends. It finds, once again, that population tended to be the clearest driver of rent values in England, while debasement was most important for Flanders and Brabant. I assemble rent data for Scotland using the rental book of Coupar

Angus. It is evident that the reaction of rents to debasement in Scotland was fairly mixed. Manorial custom was a key part of rent values, and the Abbey of Coupar Angus only tended to increase rents when a new tenant moved in. However, when a new tenant did move in, rents were increased to account for debasement. The second half of Chapter 4 looks at wages. Most of the data has been assembled by other historians, but I again utilise data from Coupar Angus, the *Exchequer Rolls of Scotland*, and other sources to offer an insight into Scottish wage levels. Again, I find that population was the strongest driver of English wages, while debasement was more important in the southern Low Countries. In Scotland, wage stickiness was prevalent for some professions, but evidence from Scottish soldiers and masons suggests that adjustment was also made to compensate for the falling silver content of the Scottish currency. The chapter ends by examining real wages in England and the southern Low Countries.

Chapter 5 draws together the conclusions from the core chapters. It emphasises that while England's economy does appear to have been more clearly driven by population levels, this might well only have been enabled by the modest policy of debasement. Indeed, it has become evident that debasement could be used to offset the economic effect of a falling population—the Flemish and Brabantine price inflation in the last quarter of the fourteenth century is a particularly good example of this. It has also become clear that while England's fifteenth-century economy was certainly less prosperous than the economy of the late fourteenth century, relative to the experience of Scotland and the southern Low Countries, England fared well.

My thesis offers a fresh and unique insight into the late medieval English economy. By stepping out of the Anglo-centric shadow, the unusual experience of England after the Black Death has truly manifested itself. It has found that neither the demographic nor the monetary theories can truly be applied in isolation to all late medieval economies, and instead we must consider a more balanced approach. My thesis has also helped to explain how a lack of comparison has led to a debate over whether England's economy was prosperous or in decline during the fifteenth century. Only by examining England in the bigger picture of her trading partners do we see that perhaps things were not as bad as we might previously have thought.

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LIST OF ABBREVIATIONS

<i>AHEW</i>	<i>The Agrarian History of England and Wales</i>
<i>BNJ</i>	<i>British Numismatic Journal</i>
<i>CPR</i>	<i>Calendar of Patent Rolls</i>
<i>EconHR</i>	<i>The Economic History Review</i>
<i>PROME</i>	<i>The Parliament Rolls of Medieval England</i>
<i>ER</i>	<i>Rotuli Scaccarii Regum Scotorum/The Exchequer Rolls of Scotland</i>
<i>RPS</i>	<i>The Records of the Parliaments of Scotland</i>

CHAPTER 1: INTRODUCTION

‘The crucial issue of comparison is geographical’, Chris Wickham urges in his manifesto for doing comparative history: ‘why things happen in different ways in different places’.¹ His words should be considered sound advice to any historian, yet the abundance of data available to historians of the post-Black Death English economy has meant that it has almost invariably been considered within a geographical vacuum. Consequently, the interpretation of the economic experience of England after the Black Death has become conflicted within the historiography—was the economy one of boom or bust; and was it demographic or monetary factors which accounted for this state of either boom or bust? Furthermore, the general lack of comparison means that detecting the place of England’s economy within the context of the wider western European picture necessarily proves difficult. Some economic historians have compared England with one other country,² but

¹ C. Wickham, ‘Problems in Doing Comparative History’, in P. Skinner (ed.), *Challenging the Boundaries of Medieval History: The Legacy of Timothy Reuter* (Turnhout, 2009), p. 6.

² See for example: S. Borsch, *The Black Death in Egypt and England: A Comparative Study* (Austin, 2005); England’s economy is also briefly put into the wider context of Europe in S. Broadberry, B. M. S. Campbell, A. Klein, M. Overton and B. van Leeuwen, *British Economic Growth, 1270–1870* (Cambridge, 2015), pp. 371–401, though the focus is on GDP rather than the trends of prices, wages and rents. Herman van der Wee examines the price trends and living standards of England and Brabant in H. van der Wee, ‘Prijzen en lonen als ontwikkelingsvariabelen: Een vergelijkend onderzoek tussen Engeland en de Zuidelijke Nederlanden, 1400–1700’, in C. Verlinden (ed.), *Album aangeboden aan Charles verlinden ter gelegenheid van zijn dertig jaar professoraat* (Wetteren, 1975). His comparison goes no further than England and Brabant, however. Herlihy’s study takes more countries into account, though the analysis remains general: see D. Herlihy, *The Black Death and the Transformation of the West* (Cambridge, Mass., 1997). Harry Miskimin has compared prices and money in fourteenth-century England and France. See H. Miskimin, *Money, Prices and Foreign Exchange in Fourteenth-Century France* (New Haven, 1963), pp. 53–99. John Munro has famously compared England with the southern Low Countries across decades’ worth of articles. See J. H. Munro, ‘Mint Outputs, Money, and Prices in Late-Medieval England and the Low Countries’, in E. Van Cauwenberghe and F. Irsigler (eds), *Münzprägung, Geldumlauf und Wechselkurse* (Trier, 1984), pp. 31–122; J. H. Munro, *Bullion Flows and Monetary Policies in England and the Low Countries, 1350–1500* (Aldershot, 1992); J. H. Munro, ‘Urban Wage Structures in Late-Medieval England and the Low Countries: Work-Time and Seasonal Wages’, in I. Blanchard (ed.),

few studies have included more than two countries, let alone considered them in equal depth.³ It is therefore still unknown to us whether England's economic experience after the Black Death was truly one of boom or bust, at the mercy of demographic or monetary factors; and whether its experience was representative of the broader north-western European experience.

My thesis rectifies this issue by offering an original comparison of England's post-Black Death economy with those of Scotland and the southern Low Countries, namely Flanders and Brabant. Triangulating the price, rent and wage data throws new light on the causes of their fluctuations. To that end, it is first necessary in this introduction: 1) to untangle the complex historiographic traditions that have so far dominated the discussion of the late medieval English economy; 2) to introduce the main demographic, monetary and environmental drivers of prices, wages and rents as economic drivers; 3) to outline the approach and structure of this thesis which, as we shall see, raises big questions about the typicality of the English economic trajectory.

1.1 ENGLAND: BOOM OR BUST?

The consequence of the late medieval English economy having normally been studied

Labour and Leisure in Historical Perspective, Thirteenth to Twentieth Centuries (Stuttgart, 1994), pp. 65–78; J. H. Munro, 'The Symbiosis of Towns and Textiles: Urban Institutions and the Changing Fortunes of Cloth Manufacturing in the Low Countries and England, 1270–1570', *Journal of Early Modern History: Contacts, Comparisons, Contrasts*, Vol. 3, No. 1 (1999), pp. 1–74; J. H. Munro, 'Wage-Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300–1500: Did Money Matter?', *Research in Economic History*, Vol. 21 (2003), pp. 185–297; J. H. Munro, 'Builders' Wages in Southern England and the Southern Low Countries, 1346–1500: A Comparative Study of Trends in and Levels of Real Incomes', in S. Cavaciocchi (ed.), *L'edilizia prima della rivoluzione industriale, secc. XIII–XVIII* (Florence, 2005), 1013–76; B. Campbell, *The Great Transition: Climate, Disease and Society in the Late-Medieval World* (Cambridge, 2016).

³ Campbell, *Great Transition* compares England's late medieval economy to a number of others, though the comparison is more concerned with the impact of climate change than monetary and demographic factors.

without comparison is that the historiography of this period has two main conflicting—and apparently irreconcilable—debates. The first concerns the state of the post-Black Death economy. The question is whether the plague ushered in a time of prosperity in the late fourteenth and fifteenth centuries, or plunged the economy into recession. Of course, it is first necessary to define ‘prosperity’. The concept of economic prosperity appears to have been expounded in two different ways in the historiography of late medieval England: by speaking in terms of a country’s rising output and production—that is to say its GDP—⁴ and by discussing the changes in the standards of living of the labouring classes. Those who speak in terms of output have tended to argue that the post-Black Death economy was prone to recession, Michael Postan being one of the most notable proponents of this view.⁵ He argued that the Black Death, rather than offering the potential for positive economic change, simply aggravated the problems of the early fourteenth century, eventually culminating in a recession that would endure until the sixteenth century.⁶ For Postan, it was apparently inevitable that the post-Black Death period would encourage a recession in the agrarian economy, one that would endure until the end of the fifteenth century. Postan believed that this recession was caused by the slump in land values and agrarian profitability.⁷ The recession likewise affected the urban economy, partly as a result of the declining agrarian economic activity, and partly because the

⁴ Though the characterisation of the late medieval English economy’s output and productivity as GDP is a more modern technique. See p. 5 below.

⁵ For a large bibliography of Postan’s work, see R. M. Hartwell and C. Wilson (eds), ‘Bibliography of the Writings of Professor M. M. Postan’, *EconHR*, New Series, Vol. 18, No. 1 (1965), pp. xiii–xv.

⁶ M. M. Postan, *The Medieval Economy and Society* (Aylesbury, 1975), pp. 39–44.

⁷ M. M. Postan, ‘The Fifteenth Century’, in M. M. Postan (ed.), *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), pp. 42–4.

numerous trade conflicts and wars in the fourteenth and fifteenth centuries were not conducive to international trade.⁸ In more recent years, John Hatcher has agreed with Postan's notion that the fifteenth century was a period of falling agricultural production, which ultimately helped to bring England's economy into a recession;⁹ and Bruce Campbell has also argued that the period from the 1370s to the 1470s was one of economic decline.¹⁰

However, there are economic historians who have argued that the post-Black Death period was one of general economic prosperity and improved agrarian production. In the early 1960s, A. R. Bridbury famously stated that the post-Black Death English economy, rather than being in a state of decline or recession, was one of 'resurgent vitality and enterprise'.¹¹ The optimistic approach to the late medieval English economy has also been supported by Christopher Dyer, who has consistently argued that the post-Black Death period was one of economic prosperity for the average labourer.¹² More recently, Gregory Clark has produced calculations of economic productivity and efficiency, and found that, following the declining productivity in the thirteenth and early fourteenth centuries, there were improvements made throughout the second half of the fourteenth century.

⁸ *Ibid.*, pp. 44–5.

⁹ J. Hatcher, *Plague, Population and the English Economy 1348–1530* (Basingstoke, 1977).

¹⁰ Campbell, *Great Transition*, p. 15.

¹¹ A. R. Bridbury, 'The Black Death', *EconHR*, Vol. 26, No. 4 (1973), pp. 577–92; A. R. Bridbury, *Economic Growth: England in the Later Middle Ages* (London, 1962), p. 24.

¹² For example: C. Dyer, *Standards of Living in the Later Middle Ages: Social Change in England c. 1200–1520* (Cambridge, 1989); C. Dyer, *An Age of Transition?: Economy and Society in England in the Later Middle Ages* (Oxford, 2005); C. Dyer, *Making a Living in the Middle Ages: The People of Britain, 850–1520* (New Haven, 2009); C. Dyer, 'A Golden Age Rediscovered: Labourers' Wages in the Fifteenth Century', in M. Allen and D. Coffman (eds), *Money, Prices and Wages: Essays in Honour of Professor Nicholas Mayhew* (Basingstoke, 2015), pp. 180–95.

This rising productivity continued until around 1450. Thereafter, productivity declined for the next hundred years, reaching its nadir in the middle of the sixteenth century and maintaining that level until the middle of the nineteenth century. Clark notes that the periods of higher and lower productivity were inversely linked with population growth and decline.¹³

And although Bridbury, Dyer and Clark have found little company in the optimistic interpretation of the post-Black Death economy, recent work from Broadberry *et al.* has moved towards reconciling the conflicting opinions over the productivity of the English economy. Although their calculations of GDP confirmed Postan's argument that productivity fell after the Black Death,¹⁴ they also noticed that real GDP per head rose after the Black Death, and that it remained at this new higher level until the seventeenth century. The rise in GDP per head largely plateaued after 1400, but it appears that the population reduction caused by the Black Death triggered a paradigm shift which resulted in a positive change in economic output.

Moreover, even though the concept of economic decline in the late medieval English economy has persisted in the historiography, it is still commonly accepted that the Black Death brought about a positive change in the living standards of the labouring classes. Though high prices, resistant landlords and sluggish improvement in wages meant that real improvements to living standard did not materialise until the 1370s, it is nevertheless

¹³ G. Clark, 'The Macroeconomic Aggregates for England, 1209–2008', *Research in Economic History*, Vol. 27 (2010), pp. 51–140; G. Clark, 'Growth or Stagnation? Farming in England, 1200–1800', *Economic History Review*, Vol. 71, No. 1 (2018), p. 75.

¹⁴ Broadberry *et al.*, *British Economic Growth*, pp. 187–244. Though Clark has criticised these estimates in Clark, 'Growth or Stagnation?'

the case that the subsequent decades set a new standard for real wages.¹⁵ Higher wages, lower prices and cheaper rents were conducive to improvements in real wages, leading James Thorold Rogers, in the late nineteenth century, to coin the term ‘Golden Age’ with respect to English labourers after the Black Death.¹⁶ This concept has been carried into modern scholarship, most notably by Christopher Dyer, who has continuously argued for the benefit of ‘price scissors’ to the working class, and that the Black Death ‘liberated the lower ranks of society’.¹⁷ Indeed, the acceptance of a positive effect of the Black Death on the living standards of labourers is so commonly accepted that even Postan conceded that, despite the general recession, the higher wages coupled with lower rents and prices translated into real gains.¹⁸

However, though the concepts of a ‘Golden Age’, ‘price scissors’ and general improvements in the standards of living of the labouring classes are commonplace in the historiography of late medieval England, universal acceptance of these concepts has not been attained. In 2011, Hatcher argued that the appearance of improving living standards for the labouring class—on account of higher wages and lower prices—was undermined by

¹⁵ That real wages finally began to improve after the 1370s is widely accepted. See for example: J. H. Munro, ‘Before and After the Black Death: Money, Prices, and Wages in Fourteenth-Century England’, in T. Dahlerup and P. Ingesman (eds), *New Approaches to the History of Late Medieval and Early Modern Europe: Selected Proceedings of Two International Conferences at the Royal Danish Academy of Sciences and Letters in Copenhagen in 1997 and 1999* (Copenhagen, 2009), pp. 335–64; C. Dyer, ‘English Diet in the Later Middle Ages’, in T. H. Aston, P. R. Coss, C. Dyer and J. Thirsk (eds), *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge, 2009), pp. 209, 214; M. Bailey, *A Marginal Economy? East Anglian Breckland in the Later Middle Ages* (Cambridge, 1989), p. 256; B. M. S. Campbell, ‘The Land’, in R. Horrox and W. M. Ormrod (eds), *A Social History of England, 1200–1500* (Cambridge, 2006), pp. 179–237, 218.

¹⁶ J. E. Thorold Rogers, *A History of Agriculture and Prices in England* (4 vols, Oxford, 1882), iv, p. 23.

¹⁷ Though ‘price scissors’ were of course to the detriment of the aristocracy, farmers and employers. See Dyer, *Standards of Living*, p. 103; Dyer, *Making a Living*, pp. 243, 268, 293.

¹⁸ Postan, ‘Fifteenth Century’, p. 42.

the reality that the demand for labour fell short of the available supply of labourers. Consequently, though day wages were higher after the Black Death than they had been previously, labourers were not able to obtain as much work as before the Black Death, thus preventing them from benefitting from the increased rates of pay.¹⁹

Though the historiography is littered with differing opinions on whether England's economy enjoyed prosperity or suffered from recession in the fifteenth century, both concepts of economic 'prosperity'—namely national output and production, and living standards of the working class—are entwined around the overall picture of prices, rents and wages. Indeed, both Clark and Broadberry *et al.* considered productivity and output in the context of price inflation/deflation, land values and wages. These are also the core components required for the detection of changes in real wages. It is for this reason that my thesis examines prices, rents and wages as a means of gauging the overall nature of the English economy after the Black Death. The comparison of prices, wages and rents in the economies of late medieval England, Scotland and the southern Low Countries will help to throw new light on the question of whether the Black Death ushered in a period of economic growth or decline.

1.2 POPULATION, MONEY, OR THE ENVIRONMENT?

We have ascertained that the first debate within the historiography of the post-Black

¹⁹ J. Hatcher, 'Unreal Wages: Long-Run Living Standards and the 'Golden Age' of the Fifteenth Century', in B. Dodds and C. Liddy (eds), *Commercial Activity, Markets and Entrepreneurs in the Middle Ages: Essays in Honour of Richard Britnell* (Woodbridge, 2011), pp. 1–24.

Death economy is whether England enjoyed prosperity or decline in this period. The second debate, again featuring apparently irreconcilable views, is over what factors drove the trends of prices, wages and rents in the wider medieval European economy.²⁰ Hatcher and Bailey, in *Modelling the Middle Ages*, identified three main schools of thought regarding the drivers of prices, wages and rents: the ‘Neo-Malthusian’ school, also called the ‘demographic’ theory; the Marxist approach; and accounts centred on commercialisation.²¹ The Neo-Malthusian theory focuses on the relationship between land and labour as a driver of prices, and thus is underpinned by fluctuations in the size of the population; the Marxist interpretation suggests that landlords and employers held the power of determination of prices, rents and wages; and the commercialisation theory focuses on the impact of ‘the use of money, the rise of the middle classes, the advance of technology, [and] the growth of towns, trade and industry’.²² The historiography has tended, however, to concentrate upon the first and third theories: aside from the work of Rodney Hilton, Robert Brenner and Stephen Rigby, Marxism has generally not been taken up by economic historians as a means of explaining the trends of the late medieval English economy.²³ Furthermore, as we shall see, the commercialisation theory has also largely translated into

²⁰ In comparison with the debate of post-Black Death economic prosperity or decline, this section necessitates a far longer discussion of the historiography on account of the complexity and nuances of the changing approaches to demographic, monetary and environmental factors.

²¹ For a summary, see J. Hatcher and M. Bailey, *Modelling the Middle Ages: The History and Theory of England's Economic Development* (Oxford, 2001).

²² *Ibid.*, pp. 121–2.

²³ In particular, see R. Hilton, *The Economic Development of Some Leicestershire Estates in the 14th and 15th Centuries* (Oxford, 1947); and S. Rigby, *English Society in the Later Middle Ages: Class, Status and Gender* (Basingstoke, 1995). Economic historians have tended to disregard Marxism as a key economic force after the so-called ‘Brenner Debate’ in the 1980s. For summary of the main contributions to the debate, see T. H. Aston and C. H. E. Philpin (eds), *The Brenner Debate: Agrarian Class Structure and Economic Development in*

examining the role of money in the determination of prices, wages and rents.

There is one new approach to the late medieval economy which is not present in the Hatcher and Bailey paradigm. In very recent years, there has been more work on the role of climate as a key driving force of the medieval economy.²⁴ The impact of poor weather on short-term agricultural price fluctuations is difficult to refute, but the more recent interpretations of climate as an economic determinant tend to speak of a more general driving force. Thus, in Broadberry *et al.*'s *British Economic Growth*, it is acknowledged that climate was an important factor in determining the land suitable for arable or pastoral farming. The period from 1300 to the mid nineteenth century was known as the 'Little Ice Age' in which a cooler climate meant that the altitude limit for arable farming was lowered, rendering higher lands suitable only for pastoral farming.²⁵ A more detailed study on the impact of climate on the late medieval European economy has recently been undertaken by Bruce Campbell. He focuses primarily on England, the Low Countries and Italy, examining the economic impact of what he calls 'The Great Transition'—a phenomenon where a combination of climate changes, disease and war caused England and the Low Countries to enjoy faster economic development.²⁶ Although this thesis is not intended to further pursue Campbell's scientific research into climate development and

Pre-Industrial Europe (Cambridge, 1985). I also discuss this in more detail below, on p. 13.

²⁴ Though more limited climatic explanations have been around for a long time, in particular with regard to the Great Famine of 1315–17. For the main works on the Great Famine, see I. Kershaw, 'The Great Famine and Agrarian Crisis in England 1315–1322', *Past and Present*, Vol. 59, No. 1 (1973); H. S. Lucas, 'The Great European Famine of 1315, 1316, and 1317', *Speculum*, Vol. 5, No. 4 (1930); B. F. Harvey, 'The Population Trend in England Between 1300 and 1348', *Transactions of the Royal Historical Society*, Vol. 16 (1966).

²⁵ Broadberry *et al.*, *British Economic Growth*, p. 55; J. M. Grove, *Little Ice Ages: Ancient and Modern* (2 vols, London, 2004), ii, pp. 622–30.

²⁶ Campbell, *Great Transition*, pp. 349–400.

instead focuses primarily on the demographic and monetary theories in a period of such turbulent weather, climate must be considered as a factor in price, wage and rent movements.

Turning now to the demographic theory, it has its foundation in the works of Thomas Malthus (1766–1834). The core of Malthus' work revolved around the notion that the population would continue to increase indefinitely unless so-called 'positive checks' acted to reduce it.²⁷ These 'positive checks' could come in the form of war, disease or famine, which were explicitly enabled by the issue of overpopulation. David Ricardo (1772–1823) also looked at the role of population in the economy.²⁸ His work spoke more in terms of 'diminishing returns', that is, productivity would be expected to fall if the labour force expanded beyond usefulness. It was upon the work of Ricardo that Postan primarily drew. From the 1930s onwards, Postan offered a number of studies of the late medieval English economy, couching the movements of prices, wages and rents in terms of population change:

When population rose agriculture expanded under conditions which economists would recognize as those of steeply diminishing returns, and agricultural prices were bound to rise. On the other hand, when population fell supplies of agricultural products would be more plentiful, relative to the amount of resources engaged in their production and relative to the demand for food, and prices would be correspondingly lower. A rise and fall in population would also have a so-to-speak selective effect on prices in that they would produce a corresponding movement in the prices of agriculture products, but would have little effect on prices of commodities not greatly subject to diminishing returns, i.e. most industrial products.²⁹

²⁷ T. Malthus, *An Essay on the Principles of Population* (Oxford, 2008).

²⁸ D. Ricardo, *On the Principles of Political Economy and Taxation* (London, 2002).

²⁹ M. M. Postan, 'The Economic Foundations of Medieval Society', in Postan (ed.), *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), p. 11; For Postan's discussion of wages, see Postan, 'Some Agrarian Evidence of a Declining Population in the Later Middle Ages', in Postan (ed.), *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), pp. 190–213.

Postan's demographic approach therefore, at its most basic level, operates with respect to supply and demand. Rising population would increase prices because demand would be higher, and diminishing returns would reduce the relative supply of agricultural goods. A falling population would increase the amount of food supply per head, and thus prices would be expected to fall. A rising population also exposed the economy to land issues—soil fertility and a resort to cultivating marginal lands contributed to falling yields.³⁰ Wages were also expected to rise in periods of labour scarcity, and the value of labour would have fallen when the workforce expanded beyond the supply of work. Likewise, a falling population would have had negative consequences for land values, and thus in periods of demographic decline, rents would be expected to have fallen.³¹ Importantly, Postan argues that population was capable of triggering long-term changes in the trends of prices, wages and rents.³²

With such a clear sense of cause and effect, it is unsurprising that the demographic theory enjoyed the support of a number of other eminent economic historians. Emmanuel Le Roy Ladurie, a keen advocate of the Neo-Malthusian model, explicitly tied demographic factors to the economy of Languedoc.³³ He argued elsewhere that before the seventeenth century, England was stuck in 'the infernal cycle of agrarian-type Malthusian

³⁰ Postan, 'Economic Foundations', pp. 14–15; Postan and J. Z. Titow, 'Heriots and Prices on Winchester Manors with Statistical Notes on Winchester Heriots by J. Longden', in Postan (ed.), *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), p. 174.

³¹ Postan, 'Fifteenth Century', p. 48; M. M. Postan, 'Some Social Consequences of the Hundred Years War', in Postan (ed.), *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), pp. 59–60.

³² Postan, 'Economic Foundations', pp. 7–19.

³³ E. Le Roy Ladurie, *The Peasants of Languedoc* (Urbana, 1974), see esp. pp. 51–131.

misfortunes', meaning that England was in a perpetual state of its population outpacing production and was thus vulnerable to war, famine and disease.³⁴ Further support for the importance of population and the demographic model favoured by Postan and Le Roy Ladurie was also expressed by Wilhelm Abel, H. J. Habakkuk, and—though to a lesser extent—Guy Bois.³⁵ The demographic theory has continued to play a role in modern scholarship around the post-Black Death period. Certainly it is difficult to stray too far away from the importance of population change in a period characterised by a plague responsible for killing between a third and a half of the English population.³⁶ Consequently, notable historians of the late medieval economy and the Black Death, such as Norman Pounds and Hatcher, have continued to frame the changes in price and wage trends after the Black Death in the context of demographic factors.³⁷ More recently, Gregory Clark, in his examination of prices and wages, has found that 'economic changes were in these years entirely a product of demographic shifts'.³⁸

³⁴ E. Le Roy Ladurie, 'A Reply to Robert Brenner', in Aston and Philpin (eds), *Brenner Debate*, p. 104. For definitions and interpretations of the 'Malthusian Trap', see: D. M. Palliser, 'Tawney's Century: Brave New World or Malthusian Trap?', *EconHR*, Vol. 35, No. 3 (1982), pp. 339–53; A. Macfarlane, *The Savage Wars of Peace: England, Japan and the Malthusian Trap* (Basingstoke, 2003), p. xxiii.

³⁵ W. Abel, *Agricultural Fluctuations in Europe from the Thirteenth to the Twentieth Centuries* (London, 1980); H. J. Habakkuk, 'The Economic History of Modern Britain', *The Journal of Economic History*, Vol. 18, No. 4 (1958), pp. 486–501; G. Bois, *The Crisis of Feudalism: Economy and Society in Eastern Normandy c. 1300–1550* (Cambridge, 1984). Bois, however, does not consider himself to be aligned with the Neo-Malthusian school, even though *The Crisis of Feudalism* found strong alignment between population trends, prices, wages and production. Bois has instead argued that there has been a lack of consideration for the importance of class structures which became the core component of the 'Brenner Debate' (see below, p. 13). G. Bois, 'Against the Neo-Malthusian Orthodoxy', in Aston and Philpin (eds), *Brenner Debate*, pp. 107–18.

³⁶ I discuss the death rates of the Black Death in Chapter 2, pp. 102–8.

³⁷ N. Pounds, *An Economic History of Medieval Europe* (London, 1974), pp. 478–9; Hatcher, *Plague*, p. 53.

³⁸ G. Clark, 'The Long March of History: Farm Wages, Population and Economic Growth, England 1209–1869', *EconHR*, Vol. 60, No. 1 (2007), p. 97; D. H. Fischer also took a strongly demographic view of the late medieval economy: see D. H. Fischer, *The Great Wave: Price Revolutions and the Rhythm of History* (New York,

However, the demographic theory began to attract criticism in the middle of the twentieth century. Robert Brenner's article, which criticised the primacy of "objective" economic forces' such as population change in the interpretation of long-term economic trends, initiated the so-called 'Brenner Debate'.³⁹ Brenner's Marxist approach considered that landlords and employers had the ultimate power to dictate rents and wages (and, by extension, prices), through their exertion of economic power over peasants. This was something which the Postan demographic theory had neglected to consider. Though Postan was careful to define the parameters of the application of the demographic theory by restricting its use to the 'economic base'—'population and land settlement, technique of production and the general trends of economic activity: in short, all those economic facts which can be discussed without concentrating on the working of legal and social institutions and upon relations of class to class'—Brenner pointed out that there was a case for not separating long-term economic trends from legal and social institutions.⁴⁰ Where Postan had apparently considered social relationships as an economic factor, Brenner found his assimilation of peasant–landlord relations into the 'relative scarcity of factors' theory inadequate.⁴¹ Though the 'Brenner Debate' came to an end after the publication of Brenner's article 'The Agrarian Roots of Capitalism', other criticisms of the

1997), pp. 11–63.

³⁹ R. Brenner, 'Agrarian Class Structure and Economic Development in Pre-Industrial Europe', in Aston and Philpin (eds), *Brenner Debate*, p. 10.

⁴⁰ Postan, 'Economic Foundations', p. 3; Brenner, 'Agrarian Class Structure', p. 15.

⁴¹ Brenner, 'Agrarian Class Structure', pp. 19–21; M. M. Postan, 'The Chronology of Labour Services', in M. M. Postan (ed.), *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Cambridge, 1973), pp. 90–1.

demographic theory continued to emerge.⁴²

The most significant alternative to the demographic theory comes under Hatcher and Bailey's 'commercialisation' umbrella. Some economic historians of the late medieval period have adopted a commercialisation interpretation and suggested that the decline in population, though it reduced the number of markets, led to better integration. In these interpretations, largely found in the works of Richard Britnell and Christopher Dyer, money shortage or abundance were not treated as key factors in market development, and acted merely as instruments of exchange.⁴³ Yet increasingly prominent in the historiography from the second half of the twentieth century onwards was a progressive disposition towards explaining long-term commercialisation trends in terms of the availability of money.⁴⁴ By extension, prices, wages and rents could also be driven by these monetary factors.

The notion that the availability of money played a key role in the determination of prices, wages and rents had begun to gain momentum from the early twentieth century after Irving Fisher (1867–1947) created the Fisher Identity:

⁴² For the rest of the 'Brenner Debate', see the other *Past and Present* contributions collated in Aston and Philpin (eds), *Brenner Debate*.

⁴³ R. H. Britnell, *The Commercialisation of English Society, 1000–1500* (Cambridge, 1992). However, Britnell, unlike Dyer, is pessimistic for the fifteenth century, especially with regard to the fifteenth-century urban economy: see R. H. Britnell, *Growth and Decline in Colchester, 1300–1525* (Cambridge, 1986), p. 193. Dyer, *Age of Transition?*, pp. 3–6 for a summary of arguments. For a discussion of both Britnell's and Dyer's approaches to money and commercialisation, see J. L. Bolton, *Money in the Medieval English Economy: 973–1489* (Manchester, 2012), pp. 261–3.

⁴⁴ See for example N. J. Mayhew, 'Modelling Medieval Monetisation', in R. Britnell and B. M. S. Campbell (eds), *A Commercialising Economy: England 1086 to c. 1300* (Manchester, 1995), pp. 74–5.

$$MV=PT$$

where M is the size of the money stock, V is the velocity of money, P is the general price level, and T is the number of transactions.⁴⁵

Thus, an increase in the money stock and/or velocity should have resulted in a rise in the number of transactions and the general price level. Indeed, Fisher stressed that the equation dictates that, in the case of a doubling of M , V can also be expected to double, and therefore ‘there is no possible escape from the conclusion that a change in the quantity of money (M) must normally cause a proportional change in the price level’.⁴⁶ It is evident that the primary shortcoming of the Fisher Identity is that it leaves no room for parts of M to be hoarded, and indeed it is unreasonable to expect that the entirety of the money stock would have been in constant circulation. In fact John Maynard Keynes (1883–1946) argued that there were three motives behind cash hoarding: 1) to ensure that people had a ready supply of cash to meet the demands of everyday purchases (the ‘income motive’); 2) to provide a safeguard against misfortune (the ‘precautionary motive’)—i.e. a ‘rainy day’ fund; and 3) to enable people to take advantage of any arising opportunities for pecuniary speculation (the ‘business motive’).⁴⁷ Thus, in the 1920s, Keynes built upon the work of Alfred Marshall and A. C. Pigou and contributed to the construction of a rival to the Fisher Identity.⁴⁸ The ‘Cambridge Cash Balances’ equation

⁴⁵ For Fisher’s derivation of the equation, see I. Fisher, *The Purchasing Power of Money; Its Determination and Relation to Credit, Interest and Crises* (New York, 1912), pp. 3–32, in particular see pp. 21–8.

⁴⁶ Fisher, *Purchasing Power*, pp. 156–7.

⁴⁷ J. M. Keynes, *The General Theory of Employment, Interest and Money* (St Ives, 2017), p. 170.

⁴⁸ A. Marshall, ‘Money’, in J. Whitaker (ed.), *The Early Economic Writings of Alfred Marshall* (2 vols, London, 1975), i, pp. 164–77; A. C. Pigou, ‘The Value of Money’, *Quarterly Journal of Economics*, Vol. 32, No. 1 (1917),

took into greater account the demand for money:

$$M = k(PT)$$

where M is the total money stock, k is the demand for money to hold, P is the price level, and T is the number of transactions.⁴⁹

Both Fisher and Keynes were primarily concerned with the role of the quantity theory of money in short-term price trends, yet the study of the post-Black Death economy has tended to examine long-term price trends. As we have seen above, Postan used population levels to explain the long-run trends of the fifteenth century,⁵⁰ and thus applications of monetary theory have tended to mirror this approach and consider the role of the money stock in the determination of long-term price trends.

Though the monetary theory had been in existence for many years, the first direct attack on Postan from a monetarist was that of W. C. Robinson in 1959.⁵¹ Robinson's initial attack on Postan's demographic theory was that Postan had rejected the availability of money as a factor explaining the late medieval economy on the basis that it should have caused 'general' price rises. Robinson, quite reasonably, pointed out that varying elasticity of demand for different goods would have meant that some prices were more prone to inflation or deflation than others, and thus a change in the money supply could

pp. 38–65.

⁴⁹ For a description of the Cambridge Cash Balances equation in the context of the medieval economy, see N. J. Mayhew, 'Population, Money Supply, and the Velocity of Circulation in England, 1300–1700', *EconHR*, New Series, Vol. 48, No. 2 (1995), pp. 240–1.

⁵⁰ See above, p. 10.

⁵¹ W. C. Robinson, 'Money, Population and Economic Change in Late Medieval Europe', *EconHR*, New Series, Vol. 12, No. 1 (1959), pp. 63–76.

not be expected to cause 'general' price changes across all commodities.⁵² Robinson also took issue with Postan's argument that the availability of money could not adequately explain the crisis of the early fourteenth century. Using the Fisher Identity, Robinson argued that the unlimited nature of price increase and transaction volumes meant that these were theoretically capped by the amount of money in circulation and the capability of velocity to enable money to meet the demands of the economy. Therefore, Robinson argued that an initial increase in the money stock caused trade and output to expand, encouraging de-hoarding. After the de-hoarding was complete and the money stock and velocity could expand no more, the upper limit of the capabilities of the money stock were reached. This caused price constriction, trade decline, and hoarding of bullion (which exacerbated the issue of depression).⁵³ Robinson also made a number of other criticisms of Postan's demographic theory, going beyond the defence of the role of money to challenge the very core of Postan's beliefs. He argued that there was little evidence that when the population was forced to cultivate 'marginal' lands, the quality was necessarily inferior to that already under cultivation. Furthermore, he contested the Malthusian model's prescribed inevitability of crises, such as famine and disease, stating that even in periods where Postan conceded that population was stable, these crises still occurred.⁵⁴

Postan's response to Robinson's criticisms, published within the same issue of *The Economic History Review*, offered a number of clarifications in his use of the demographic theory. Most importantly, he emphasised that he did not disregard the role of money

⁵² Robinson, 'Money', pp. 64–6; Postan, 'Economic Foundations', p. 9.

⁵³ Robinson, 'Money', pp. 66–7.

⁵⁴ *Ibid.*, pp. 68–73.

entirely, and that demand could only influence prices if there was an accompanied change in the size of the money stock. Postan called this 'effective demand'.⁵⁵ Yet there is still an implied neutrality in the role of money if its function was merely to rise or fall in accordance with demand to enable population pressure to be the primary driver of prices. While Postan's somewhat brutal reply to Robinson seems to have had the effect of silencing him for ever, it has become commonplace in more modern historiography to cast aside the implied neutrality of money in favour of accepting that it played a more decisive role in price, wage and rent level determination.

Subsequently, a number of eminent medieval economic historians have argued that monetary factors were a key (but not the only) driver of prices, and—to a lesser extent—wages. In the 1960s, Harry Miskimin argued that many of the fluctuations in French grain prices in the early fourteenth century were the result of debasement, rather than a consequence of poor weather or war.⁵⁶ In the last quarter of the twentieth century, John Munro rose to prominence as one of the most keen advocates for the role of money in the determination of medieval prices and—though to a slightly lesser extent—wages.⁵⁷ Munro conceded that the demographic theory has many benefits, and can explain why grain prices were more prone to inflation than other prices; almost in agreement with Postan, he argued that the stock and flows of money alone can account for general price rises.⁵⁸

⁵⁵ M. M. Postan, '[Money, Population and Economic Change in Late Medieval Europe]: Note', p. 78, *EconHR*, New Series, Vol. 12, No. 1 (1959), pp. 77–82.

⁵⁶ Miskimin did not deny entirely the role of 'real' factors—such as famine, disease and war— and was willing to accept that monetary factors did not explain all the instances of disparity between English and French prices. Miskimin, *Money, Prices and Foreign Exchange*, pp. 96–8.

⁵⁷ Munro has not tended to look at medieval rents.

⁵⁸ Munro, 'Before and After the Black Death', pp. 335–7.

Though, as we have seen, monetary theory (in its purest form) is synonymous with ‘quantity theory’, Munro resisted the deterministic and simplistic approach to the relationship between money and prices that was the crux of the Fisher Identity.⁵⁹ His work has instead concentrated upon the relationship between mint outputs and price levels, while still acknowledging the importance of other shock factors—war, trade conflict, disease, poor weather, and famine.⁶⁰

In more recent years, monetarists have more keenly emphasised the different effects that fluctuations in M could have on prices, drawing clearer parameters for the application of monetary theory and adopting a more balanced approach to the interpretation of the late medieval economy. Nicholas Mayhew stressed that monetary theory is predominantly applicable to ‘the medium- and long-term behaviour of the general price level’. However, he gave the caveat that ‘population remains fundamental for the supply of labour, the level of wages and overall output’.⁶¹ Munro, in the final article before his death, also took a softer approach to the application of monetary theory. He continued to argue that the Postan demographic model provides the ‘least satisfactory explanation’ for the

⁵⁹ Indeed, a stringent application of quantity theory on medieval prices, wages and rents would be nigh on impossible. Though there have been a number of attempts to calculate the money stock of England, there is great variation between the estimates (but less variation than there is for English population estimates). Chapter 2 explores more fully the prevailing estimates of the English money stock. Furthermore, there have been no attempts to offer regular estimates of the total volume of circulating currency in Scotland, Flanders or Brabant during the late medieval period. Thus, ‘monetarist’ economic historians of the medieval period, such as Munro, are forced to rely chiefly on mint output as an indication of the fluctuating availability of money. See Munro, ‘Mint Outputs, Money, and Prices’, pp. 31–122.

⁶⁰ For example, Munro has explained the lack of deflation in Flanders after the 1407 reinforcement of the coinage as resulting from poor weather and poor harvests in 1408–9. Likewise, he accredited the inflation of the 1430s, which came in the same decade as the Flemish monetary unification and reinforcement, as resulting from bad weather. Munro, ‘Mint Outputs, Money, and Prices’, pp. 52–3.

⁶¹ N. J. Mayhew, ‘Prices in England, 1170–1750’, *Past and Present*, Vol. 219, No. 1 (2013), p. 6.

trends seen in medieval prices and wages; yet his argument leaves more space for ‘real’ factors than in previous works.⁶²

The strain of monetary theory that has been applied to medieval economies is more nuanced than the traditional quantity theory approach because it requires additional caveats to the basic Fisher Identity and Cambridge Cash Balances equations. There are few medieval economies where it has been possible to construct regular estimates of the total volume of the money stock—where there are estimates, such as for England, the figures can vary widely (though still less so than population estimates).⁶³ Thus, medieval economic historians who have sought to take a more monetary approach to the interpretation of price, wage and rent trends have generally been required to rely on mint output as a means of gauging fluctuations in the availability of money. The commodity money system of the medieval period also meant that debasement, while in itself not a core component of pure quantity theory, *could* have increased mint output and translated into a rise in the overall availability of money.⁶⁴ Mayhew has argued that the volume of the medieval money stock was prone to gradual decline—due to loss, wear, hoarding, and export—so that it required constant replenishment from the mints.⁶⁵ For mint output to remain constant, a steady stream of new bullion was required—either foreign or freshly

⁶² J. H. Munro, ‘Money Matters’: A Critique of the Postan Thesis on Medieval Population, Prices, and Wages’, in J. Drendel (ed.), *Crisis in the Later Middle Ages: Beyond the Postan–Duby Paradigm* (Turnhout, 2015), p. 179.

⁶³ The different estimates of the English money stock are discussed in Chapter 2, p. 85.

⁶⁴ A commodity money system is when money is manufactured from materials which have their own value, i.e. gold and silver.

⁶⁵ N. J. Mayhew, ‘Numismatic Evidence and Falling Prices in the Fourteenth Century’, *EconHR*, Vol. 27, No. 1 (1974), pp. 1–15.

mined. If there was a lack of new bullion coming to the mints, then the quantity of money in circulation could be increased by initiating a debasement, which acted to reduce the amount of bullion in each coin. This meant that more coins could be struck from the same unit of bullion. This *should* have had the effect of increasing the total money stock.⁶⁶ Therefore, while debasement alone could not have been a reliable means of increasing the money stock, it must be considered to have been a significant component in fluctuations in the size of the money stock and is thus key to the application of quantity theory on the medieval economy.

Another important consideration for medieval applications of quantity theory is the role of credit and its relationship with the money stock. The intended interpretation of ‘credit’ here is either the loaning of money or deferral of payments within the domestic economy, rather than commercial credit instruments (i.e. ‘bills of exchange’) which were used for the benefit of mercantile convenience. The function of domestic credit in a medieval economy has two alternative and contrasting interpretations. The first, primarily argued by Jim Bolton, is that it served to expand the money stock in times of crisis, essentially offsetting any shortfall.⁶⁷ In this instance, the implication for quantity theory is clear—the outputs of the mints cannot be used as an indicator of the fluctuating volume of money in circulation. However, the second interpretation of medieval credit is that it

⁶⁶ However, if the debasement was too dramatic, then it could cause panic in the market and trigger hoarding, which would have decreased the money stock. P. Spufford, *Money and Its Use in Medieval Europe* (Cambridge, 2008), p. 380; J. H. Munro, *Wool, Cloth, and Gold: The Struggle for Bullion in Anglo-Burgundian Trade, 1340–1478* (Brussels, 1972), p. 17.

⁶⁷ Bolton, *Money in the Medieval English Economy*, pp. 268–95. Hatcher has also supported this theory: Hatcher, *Plague*, p. 53.

expanded and contracted in line with the money stock; in periods of monetary shortage, credit crises were more likely to appear. Though a commonplace interpretation of credit with respect to the modern economy, this argument was initially applied to the medieval economy by Mayhew, who argued in 1987 that credit could not make up for deficiencies in the money stock.⁶⁸ Pamela Nightingale went further and argued that when there were shortages of money—indicated by mint output—it was reasonable to expect that credit contraction would ensue.⁶⁹ Mayhew and Nightingale tend to discuss credit with respect to the more commercialised end of the economy, with Nightingale in particular focusing on the credit relations among urban merchants.⁷⁰ If the availability of credit is also influenced by trust in the borrower, one might expect that credit would have been more readily available in the rural economy. Yet Chris Briggs has found that rural credit was also prone to contraction in periods of apparent money scarcity, namely in the fifteenth century.⁷¹ Indeed, the overwhelming view of recent scholarship on late medieval credit, and the view adopted in this thesis, is that its availability was directly tied to the perceived availability of money, which is to say mint output. Therefore, it is presumed in this thesis that credit does not interfere with the role of mint output as an indicator of the total

⁶⁸ N. J. Mayhew, 'Money and Prices in England from Henry II to Edward III', *The Agricultural History Review*, Vol. 35, No. 2 (1987), pp. 121–32, p. 121.

⁶⁹ P. Nightingale, 'Monetary Contraction and Mercantile Credit in Later Medieval England', *EconHR*, Vol. 43, No. 4 (1990), pp. 560–75. This view has been supported in R. Goddard, *Credit and Trade in Later Medieval England, 1353–1532* (London, 2016), pp. 138–40.

⁷⁰ Nightingale, 'Monetary Contraction'; P. Nightingale, 'Money and Credit in the Economy of Late Medieval England', in P. Nightingale, *Trade, Money and Power in Medieval England* (Aldershot, 2007), especially pp. 56–68.

⁷¹ C. Briggs, 'The Availability of Credit in the English Countryside 1400–1480', *The Agricultural History Review*, Vol. 56 (2008), pp. 1–24.

money stock.

The historiography of the monetarist interpretations of late medieval economic trends leaves us with two main crisis periods: the ‘bullion famine’ of c.1395–1415, and the so-called mid fifteenth-century ‘slump’ of c.1440–1470. John Day argued that the bullion famine, which was the first main period of money scarcity in the post-Black Death period, was the result of a long-term balance of trade deficit from Europe to the Levant. This trade deficit arose from the import of high-cost luxury goods, like silk and alum. The result of this deficit was that both silver and gold were drained from Europe, resulting in a general shortage of money.⁷² This caused general deflation throughout affected economies.⁷³ Though Day’s views on the existence of a bullion famine have largely been adopted by monetary historians,⁷⁴ more recent scholarship has sought to refine the crisis to argue that the shortage of bullion was most pertinent to silver.⁷⁵ In particular, Peter Spufford

⁷² J. Day, ‘The Great Bullion Famine of the Fifteenth Century’, *Past and Present*, No. 79 (1978), pp. 5–6.

⁷³ *Ibid.*, p. 24.

⁷⁴ See, for example: H. A. Miskimin, ‘Money and Money Movements in France and England at the End of the Middle Ages’, in J. F. Richards (ed.), *Precious Metals in the Later Medieval and Early Modern Worlds* (Durham, N.C., 1983), pp. 80–2; J. H. Munro, ‘Bullion Flows and Monetary Contraction in Late-Medieval England and the Low Countries’, in J. F. Richards (ed.), *Precious Metals in the Later Medieval and Early Modern Worlds* (Durham, N.C., 1983), pp. 97–158; P. Nightingale, ‘Gold, Credit, and Mortality: Distinguishing Deflationary Pressures on the Late Medieval English Economy’, *EconHR*, New Series, Vol. 63, No. 4 (2010), pp. 1081–104; J. H. Munro, ‘Coinage Debasements in Burgundian Flanders, 1384–1482: Monetary or Fiscal Policies?’, in D. Nicholas, B. S. Bachrach and J. M. Murray (eds), *Comparative Perspectives on History and Historians: Essays in Memory of Bryce Lyon (1920–2007)* (Kalamazoo, 2012), p. 315; Mayhew, ‘Prices in England’, pp. 28–33.

⁷⁵ Indeed, this is a logical progression because within the monetarist interpretation of medieval prices etc., there has also been a tendency to subdivide the money stock into gold, silver and billon. (Indeed, non-monetarists, like Postan, have also acknowledged the difference in the uses of each metal.) The reasoning behind this approach is that it is generally agreed that each metal was more suitable for different purposes within the economy: gold was preferred for use by the rich, merchants, and for international trade; silver was preferable for the domestic economy where smaller transactions were commonplace; billon, where it existed, formed an important part of the petty coinage, which was essential for everyday transactions. For

has suggested that the closure of central European mines in the fourteenth century contributed to the growing shortage of silver, which was the predominant victim of the bullion famine, though gold stocks were still in decline between the 1390s and the 1420s.⁷⁶

Day's original article suggested that the bullion famine affected Europe as a whole and did not apply specifically to England. However, it has become commonplace in modern historiography of the medieval English economy to apply the bullion famine theory to England, largely on account of the numerous complaints in the parliament rolls about the lack of silver in this period.⁷⁷ The existence of a bullion famine in England has also been argued to have been due to the reduction in the output of the mints.⁷⁸ Furthermore, economic historians focusing on the availability of credit in the late medieval English economy have suggested that there was a contraction of credit in this period, which further suggests that there was a shortage of money.⁷⁹

Yet, as commonplace as the bullion famine is in the historiography of late medieval

evidence of the differences between the uses of gold, silver and billon, see Postan, 'Economic Foundations', p. 9; M. Casson and C. Casson, 'Modelling the Medieval Economy: Money, Prices and Income in England, 1263–1520', in M. Allen and D. Coffman (eds), *Money, Prices and Wages: Essays in Honour of Professor Nicholas Mayhew* (Basingstoke, 2015), p. 65; J. H. Munro, 'Deflation and the Petty Coinage Problem in the Late-Medieval Economy: The Case of Flanders, 1334–1484', *Explorations in Economic History*, Vol. 25, No. 4 (1988), pp. 387–423. Redish and Weber found that adding small change to an economy where only large coins existed has the effect of improving welfare. See A. Redish and W. E. Weber, 'Coin Sizes and Payments in Commodity Money Systems', *Macroeconomic Dynamics*, Vol. 15, S.1 (2011), pp. 62–82.

⁷⁶ Spufford, *Money and Its Use*, pp. 343–5.

⁷⁷ Bolton, *Medieval English Economy*, pp. 78–9; Munro, 'Coinage Debasements in Burgundian Flanders', p. 319. Munro dates the bullion famine slightly earlier than Day, starting in 1375 and ending in 1415.

⁷⁸ This was a core component of Day, 'Bullion Famine'. Allen also argues that the closure of the Calais mint is particularly indicative of the existence of a bullion famine. See M. Allen, *Mints and Money in Medieval England* (Cambridge, 2012), p. 271.

⁷⁹ Nightingale, 'Monetary Contraction', pp. 569–74. Indeed, even Bolton conceded that the bullion famine might have led to a contraction of credit. See J. L. Bolton, 'Was There a "Crisis of Credit" in Fifteenth-Century England?', *BNJ*, Vol. 81 (2011), pp. 151–2.

Europe, and England, there have been a number of historians who have sought to disprove its existence or lessen its impact. This has mainly been argued on the grounds that there is no irrefutable way to demonstrate that the supply of bullion declined. Nathan Sussman argued that there was insufficient evidence to conclude that medieval France suffered from a bullion famine at the turn of the fourteenth century. He suggests that a low mint output would not necessarily be indicative of a balance of payments deficit, and could simply reflect an increased preference for hoarding.⁸⁰ Sussman also noted that the mint output at Montpellier and Romans was higher during the bullion famine period than the preceding period.⁸¹ The point has also been made that the bullion famine occurred in a period when Europe, and specifically England, was still suffering from demographic decline. This meant that, while the overall supply of bullion might have fallen, there is less reason to argue that the per capita stock of bullion also fell.⁸²

Another substantial—yet controversial—challenge to the bullion famine narrative has been made by Thomas Sargent and François Velde in their renowned work, *The Big Problem of Small Change*. They drew on the work of Carlo Cipolla who, in the 1950s, had observed that in the medieval period it was more common for petty coins to be ‘tokens’

⁸⁰ N. Sussman, ‘The Late Medieval Bullion Famine Reconsidered’, *The Journal of Economic History*, Vol. 58, No. 1 (1998), p. 133.

⁸¹ *Ibid.*, p. 150.

⁸² J. L. Bolton, *The Medieval English Economy 1150–1500* (London, 1980), p. 80; M. Allen, ‘The First Sterling Area’, *EconHR*, Vol. 70, No. 1 (2017), pp. 79–100.

of little or no intrinsic value, and only larger denominations had an intrinsic value approaching their face value.⁸³ Sargent and Velde argued that it is commonplace for historians to mistake shortages of small change for bullion famines; both would produce complaints about a lack of money. Their argument also concentrated on the problematic policy of monetary stability in England, which led to overvalued coins, a lack of small change, and subsequent importation and use of debased foreign coins.⁸⁴ Thus the primary motive behind debasement was to ensure an adequate supply of small change.⁸⁵ And the argument that there was a general lack of small change is given further credence when we acknowledge that the cost of striking small coins (per pound of output) was higher, and thus the incentive for the mints was reduced. Thus, it was important that the *traite* of the petty coins was higher than those of larger coins.⁸⁶ This enabled the mints to take a higher tale value fee to offset the higher cost of labour,⁸⁷ while still allowing the mint-goer to

⁸³ C. M. Cipolla, *Money, Prices and Civilisation in the Mediterranean World: Fifth to the Seventeenth Century* (Princeton, 1956), pp. 27–37.

⁸⁴ T. J. Sargent and F. R. Velde, *The Big Problem of Small Change* (Princeton, 2002), pp. 124–6, 131–8.

⁸⁵ *Ibid.*, pp. 10–1. The notion that there was a general lack of small change in England and medieval Europe as a whole has not escaped criticism, however. In 1988, before the publication of *The Big Problem of Small Change*, Munro had argued that determining what constituted a lack of small change was difficult. See Munro, ‘Deflation and the Petty Coinage’, pp. 387–423. Furthermore, in 2012, Munro stated that there is little evidence to suggest that debasement was used to increase the volume of petty coinage in circulation. J. H. Munro, ‘The Technology and Economics of Coinage Debasements in Medieval and Early Modern Europe: with Special Reference to the Low Countries and England’, in J. H. Munro (ed.) *Money in the Pre-Industrial World: Bullion, Debasements and Coin Substitutes* (London, 2012), p. 32.

⁸⁶ The *traite* is the percentage increase in coins yielded from a unit of bullion. It is calculated with the formula: $t = (1/[1-x]) - 1$, where x is the percentage of debasement. Thus, a debasement of 12% (0.12) will yield an increase in *traite* of 13.6%. For more on *traites*, see Munro, ‘Deflation and the Petty Coinage’, pp. 389–92.

⁸⁷ Grierson and Spufford note that there was more labour involved in striking smaller denominations than there was for larger denominations, i.e. four times as much labour was required to strike 1d.’s worth of farthings than for a single penny coin. Munro’s response to this acknowledged the argument, but stressed that this was only applicable to England, where the *traites* of silver denominations remained identical. See

profit (in tale terms) from bringing bullion to the mint.⁸⁸ England failed this requirement primarily because in the post-Black Death period there were just two attempts to positively shift the *traite* of petty coins—in 1335 and in 1445–7.⁸⁹ Therefore, while countries where the petty coins were made from billon (or at least not kept proportional in intrinsic value to their larger denominations) suffered less from the high cost of minting small change, it is likely that England was more prone to the problem.

The other main crisis of the post-Black Death period, the so-called mid fifteenth-century ‘slump’ of c.1440–70, has been a particularly prominent part of the modern narrative of the late medieval English economy. Hatcher has been the main proponent of the mid fifteenth-century slump, arguing that the recession manifested itself most clearly in the form of falling trade performance and a slump in the agrarian economy.⁹⁰ Britnell has written largely in support of Hatcher, arguing that there were two potential drivers of the slump: the impact of recurrent plague; and the decline in trade caused by ‘war, trade embargoes or contracting demand in foreign markets’.⁹¹ Plague epidemics were especially bad from the 1430s to the 1470s, meaning that demographic decline in England continued during this period.⁹² Likewise, in addition to piracy and a general European recession, the

P. Grierson, *Later Medieval Numismatics (11th–16th Centuries): Selected Studies* (London, 1979), p. 113; P. Spufford, *Monetary Problems and Policies in the Burgundian Netherlands 1433–1996* (Leiden, 1970), p. 44; Munro, ‘Deflation and the Petty Coinage’, pp. 402–3.

⁸⁸ This was especially important for England once the mint began taking fees in terms of tale rather than weight. This came in June 1351, when the Tower mint was awarded a flat tale rate of 8d. for all denominations. See Allen, *Mints and Money*, p. 178. Incidentally, this also suggests that there was a lack of petty coins at the start of the apparent mid fifteenth-century ‘slump’.

⁸⁹ Allen, *Mints and Money*, pp. 80, 151, 154.

⁹⁰ Hatcher, ‘Great Slump’, pp. 237–72.

⁹¹ R. Britnell, ‘The Economic Context’, in A. J. Pollard (ed.), *The Wars of the Roses* (Basingstoke, 1995), p. 43.

⁹² There were particularly bad epidemics, which affected the entire kingdom in 1433–5, 1438–9, 1463–4, 1467,

mid fifteenth century played host to a successful Burgundian ban on English cloth from 1447 to 1552—in 1449, parliament alleged that the cloth ban was responsible for unemployment.⁹³

Though there is a demographic element in Britnell's interpretation of the mid fifteenth-century slump, the monetary explanation has tended to take the prominent role as the cause of the downturn. Spufford's and Day's works on the period have suggested that it was the result of the same continued outflow of bullion—of both gold and silver—combined with the low output of European mines, that had caused the bullion famine of c.1395–1415. Mint closures were rife across Europe, and even supplies of 'black' money began to run out on the Continent. In England, the commons petitioned in parliament that the south-western silver mines be reopened.⁹⁴ Hatcher, while acknowledging the fact that this period almost certainly did see some demographic decline, argued strongly that the cause of the recession stemmed from the fall in trade. This fall in trade was indicated by low customs revenues around the middle of the fifteenth century.⁹⁵ A decline in trade naturally translated into a drop in mint outputs, as indicated by the falling profits of the royal mints in the middle of the fifteenth century.⁹⁶ This fall in available bullion helped to damage the availability of commercial credit, which further hindered trade.⁹⁷ The impact of this monetary crisis was, according to Hatcher, felt domestically in the form of

1471, 1473 and 1479–80. See Britnell, 'Economic Context', p. 44.

⁹³ *Ibid.*, pp. 44–6.

⁹⁴ Spufford, *Money and Its Use*, pp. 356–62; J. Day, *The Medieval Market Economy* (Oxford, 1987), pp. 58–62.

⁹⁵ J. Hatcher, 'The Great Slump of the Mid-Fifteenth Century', in R. Britnell and J. Hatcher (eds), *Progress and Problems in Medieval England: Essays in Honour of Edward Miller* (Cambridge, 2002), pp. 237–72.

⁹⁶ Allen, *Mints and Money*, p. 200.

⁹⁷ P. Nightingale, 'England and the European Depression of the Mid-Fifteenth Century', *Journal of European*

falling prices. The fall was particularly dramatic for agricultural commodities, such as sheep fleeces, the value of which essentially halved from between the start and the middle of the fifteenth century. This decline in agrarian commodity prices had an impact across the countryside. Consequently, there was a decline in pastoral farming, and land rents fell. Wages held up, but the prices of some commodities also fell between the 1440s and 1480s.⁹⁸

There is clear similarity in the bullion famine of c.1395–1415 and the crisis of the mid fifteenth century. Both revolved around a lack of bullion, and both were expected to cause periods of prolonged deflation. Combined with issues of recurring plague epidemics throughout the late fourteenth and fifteenth centuries, it is evident that the historiography of post-Black Death England (and Europe) is largely shaped by the existence of demographic and monetary crises.

1.3 THE APPROACH OF THIS THESIS

It has been established that the narrative of the late medieval English economy, until now, contains two unresolved debates: whether the post-Black Death economy was one of prosperity or decline; and whether the economy was driven predominantly by demographic or monetary forces. These debates have largely utilised price, wage and rent data as a metric for economic change. My thesis will demonstrate that new light can be shed on these debates if the late medieval English economy is put into a wider context by

Economic History, Vol. 26, No. 3 (1997), pp. 631–56.

⁹⁸ Hatcher, 'Great Slump', pp. 250–63. Hatcher cites evidence from M. Mate, 'Tenant Farming and Farmers: Kent and Sussex', in E. Miller (ed.), *AHEW* (8 vols, Cambridge, 1991), iii, p. 695. Chapters 3 and 4 of my thesis explore the movements of prices, wages and rents in more detail.

comparing it with Scotland and the southern Low Countries. In particular, the thesis examines the impact that changing population levels, mint output, debasement and—where possible—fluctuations in the size of the money stock could have on long-term trends of prices, rents and wages. That then makes it possible to test the extent to which the monetary and demographic theories are applicable interpretations of the post-Black Death economies of England, Scotland and the southern Low Countries—from which the advantages and limitations of each approach become clearer than when they have been examined within an essentially English context. The result of the exercise is to provide important fresh insights into the decades-old debates which have become ingrained in the narrative of the late medieval English economy.

I have selected Scotland and the southern Low Countries—in other words, Flanders and Brabant—because of the close economic partnerships between the countries, and their geographical proximity. Their trade relationships enable a fuller comparison of the effects of the bullion famine of c.1395–1415 and the mid fifteenth-century slump, given that the three ‘countries’ were in direct competition for the limited bullion stocks. Their geographical proximity is also beneficial—no economic historian would refute the short-term impact of climate shocks on the general price level, and by comparing ‘countries’ with similar weather patterns, I reduce the risk of finding dramatic weather-induced price swings that are particular to one country alone. The inclusion of *both* Flanders and Brabant is motivated by a desire to maximise the available data. Given that Flanders was coastal and Brabant was landlocked, I draw a distinction during the discussion of specific data, because the geographical location of each region could have impacted on its overall

price trends. Furthermore, by selecting Scotland, I am able to present another lens through which to examine the economy of northern England in future research; it is quite possible that the prices found for Scotland, which tend to be from the Lowlands, are more representative of those in northern England. In addition, the inclusion of Scotland is an attempt to make the study of late medieval English history broader and more ‘British’.⁹⁹

A great deal of data is required to make such a large-scale comparison feasible and to produce all the graphs and tables in this thesis. Fortunately, much of the necessary data has already been compiled by other economic historians. The exchange rates of the currencies can be obtained from Spufford and Wilkinson’s *Handbook of Medieval Exchange*, while the weights of the currencies appear in various published sources.¹⁰⁰ Mint output data is also fairly easily obtained for England and the southern Low Countries, with Allen and Munro in particular having done significant amounts of work on the subject.¹⁰¹ Scottish mint output data is less straightforward to obtain; it had to be abstracted from

⁹⁹ Unfortunately there is insufficient data for Wales and Ireland, which has prevented me from making this a truly ‘British’ thesis.

¹⁰⁰ The English coin weight data comes from Allen, *Mints and Money*, pp. 154–5; while E. Gemmill and N. J. Mayhew, *Changing Values in Medieval Scotland: A Study of Prices, Money, and Weights and Measures* (Cambridge, 1995), pp. 138–9 and B. H. I. H. Stewart, *The Scottish Coinage* (London, 1967) provide the data for Scotland. The Flemish and Brabantine data was found in van der Wee, *Growth of the Antwerp Market*, i, pp. 124–9 and Munro, *Wool, Cloth, and Gold*, pp. 209–11.

¹⁰¹ Allen, *Mints and Money*, Appendix C; Munro, ‘English Mint Output Data’ (29 June 2018); Munro, ‘Flemish and Brabantine Mint Output Data’ (29 June 2018). Note that Munro’s mint output data for England does not contain gaps in periods of missing accounts because he has filled them using averages of surrounding years. In the interest of tidiness, I have given titles to Munro’s Excel files. The full URL can be found in the Bibliography under my assigned title for the file(s).

Cochran-Patrick's collection of Scottish mint documents, and then converted into annual figures to facilitate comparison with the data from England and the southern Low Countries.¹⁰² Population data is readily available for England, with the original estimates given by Russell, Postan and Hatcher having been superseded by more modern scholarship from Broadberry *et al.*¹⁰³ Flemish and Brabantine population estimates have not been compiled in the same way as the English figures but, using the sporadic evidence from hearth taxes, and the population change rate suggested by van der Wee, I have managed to model the population size of Flanders and Brabant.¹⁰⁴ Unfortunately, Scottish data is too sparse to make even quantitative extrapolations, so we are left to speculate on the overall population trend of the fifteenth century by looking at more anecdotal data. Crop yield data for England is readily available from Campbell, and other sources to provide confirmation that the weather trends in Scotland and the southern Low Countries seem to have largely reflected the climate trends seen in England.¹⁰⁵

Price and wage data is easily obtained for England, with Farmer, Clark and Munro's

¹⁰² R. W. Cochran-Patrick (ed.), *Records of the Coinage of Scotland* (2 vols, Edinburgh, 1876), i.

¹⁰³ J. C. Russell, *British Medieval Population* (Albuquerque, 1948); M. M. Postan, 'Medieval Agrarian Society in Its Prime', in M. M. Postan (ed.), *The Cambridge Economic History of Europe, Vol. 2: The Agrarian Life of the Middle Ages* (8 vols, Cambridge, 1966), pp. 548–632; Hatcher, *Plague*, p. 71; Broadberry *et al.*, *British Economic Growth*, p. 20.

¹⁰⁴ W. Prevenier and W. Blockmans, *The Burgundian Netherlands* (Cambridge, 1986), p. 392; W. Blockmans, G. Pieters, W. Prevenier and R. W. M. van Schaik, 'Tussen crisis en welvaart; sociale verandering 1300–1500', in D. P. Blok (ed.), *Aldemene geschiedenis der Nederlanden* (12 vols, Haarlem, 1980), iv, pp. 44–5, 49, 52; van der Wee, *Growth of the Antwerp Market*, i, p. 546.

¹⁰⁵ B. M. S. Campbell, 'Three Centuries of English Crop Yields', <<http://www.cropyields.ac.uk>> (4 February 2018); van der Wee, *Growth of the Antwerp Market*, i, pp. 550–7; Campbell, *Great Transition*, p. 279, 280; A. G. Dawson, *So Foul and Fair a Day: A History of Scotland's Weather and Climate* (Edinburgh, 2009), p. 105; A. Grant, *Independence and Nationhood: Scotland 1306–1469* (London, 1984), p. 74.

database offering annual figures.¹⁰⁶ English rent data comes from the substantial work undertaken by Davenport, Bailey and Clark.¹⁰⁷ For Flanders and Brabant, price and wage data is again obtained from Munro.¹⁰⁸ Rent data for Flanders has not been examined by Munro, and I instead use the work of Lies Vervaet and Tim Soens.¹⁰⁹ Scottish price data is available in Gemmill and Mayhew's study of prices,¹¹⁰ but there is no comprehensive collection of rent or wage data. I thus draw upon the (unique) records of the Abbey of Coupar Angus for an example of rent values in Scotland. This same data also offers some examples of wages.¹¹¹ These examples are supplemented with other individual pieces of evidence found in the *Exchequer Rolls of Scotland*.¹¹²

The breadth of my study exceeds that of other comparative work, and the inclusion of population data enables my research to consider more fully the statistical role of population within the medieval economy in a way which has not been undertaken hitherto. Much of the information obtained is in a form that is fairly compatible with statistical analysis, which enables me to build upon the methodology used by Munro and include a

¹⁰⁶ D. L. Farmer, 'Prices and Wages', in E. Miller (ed.), *AHEW* (8 vols, Cambridge, 1991), iii, pp. 431–525; G. Clark, 'The Price History of English Agriculture, 1209–1914', *Research in Economic History*, Vol. 22 (2004), pp. 35–105; Munro, 'English Prices and Wages Data' (29 June 2018).

¹⁰⁷ F. G. Davenport, *The Economic Development of a Norfolk Manor, 1086–1565* (London, 1967), p. 78; Bailey, *Marginal Economy?*, pp. 228–9, 268–9; M. Bailey, *The Decline of Serfdom in Late Medieval England: From Bondage to Freedom* (Woodbridge, 2014), p. 166, 172, 175; G. Clark, 'Microbes and Markets: Was the Black Death an Economic Revolution?', *Journal of Demographic Economics*, Vol. 82, No. 2 (2016), pp. 139–165.

¹⁰⁸ Munro, 'Flemish Prices and Wages Data' (29 June 2018); Munro, 'Brabantine Prices and Wages Data' (29 June 2018).

¹⁰⁹ My thanks to Lies Vervaet and Tim Soens for giving me access to their respective datasets.

¹¹⁰ Gemmill and Mayhew, *Changing Values*.

¹¹¹ *Rental Book of the Cistercian Abbey of Cupar-Angus: With the Breviary of the Register*, ed. C. Rogers (2 vols, London, 1879), i.

¹¹² *The Exchequer Rolls of Scotland*, ed. G. Burnett et al. (Edinburgh, 1878–1908).

greater range of data. Like Munro, I employ regression analysis to test the relationship between independent and dependent variables.¹¹³ I also use r^2 to measure how much of a dependent variable's trend is explained by the independent variable. R^2 is also employed as a measure of price volatility, in conjunction with standard deviation.¹¹⁴ These statistical methods, in conjunction with the breadth of the data employed in this thesis, offer a uniquely wide-ranging—yet detailed—insight into the driving forces behind medieval price, rent and wage trends.

Though I closely examine the impact of monetary and demographic factors on prices, wages and rents, in order to test the extent to which England's economy differed from those of Scotland and the southern Low Countries, the size of this study has required me to make explicit some parameters. The work of Postan has naturally formed a key starting point for this research, but there is insufficient space to engage with all his work, and thus some aspects are excluded. For example, I do not discuss the varying interpretations of marginal productivity, a topic which has already received attention from some economic historians.¹¹⁵ Furthermore, even though prices, wages and rents form an important part of understanding changing living standards, discussion of changing class structures is not the intention of this thesis. I have left that to the Marxists.

To examine the impact of demographic and monetary factors on prices, wages and

¹¹³ Regression analysis is generally more appropriate than correlation because it considers the extent to which the independent variable influences the dependent variable, whereas correlation simply measures the relationship between two variables.

¹¹⁴ Munro made particularly heavy use of regression analysis and r^2 in Munro, 'Mint Outputs, Money, and Prices', though his work did not include population data, rents, or any region other than England and the southern Low Countries.

¹¹⁵ Bailey, *Marginal Economy?*.

rents, it is first necessary to look at the debasement policies, mint outputs and population levels of each country included in this study. Chapter 2 does this by putting England's sterling into the context of her trading partners. Having demonstrated that England's silver currency was unusually stable, it compares the monetary policies of England with those of Scotland and the southern Low Countries. As a first step towards assessing the impact of money on prices, wages and rents, Chapter 2 also sets out the prevailing estimates of the English money stock. Additionally, it gives the known outputs of the English, Flemish and Brabantine mints. Using the data from the Cochran-Patrick collection of mint records, I construct the first time series of annual Scottish mint output, in terms of both output weight and value. After discussing the impact of the Black Death and the prevailing opinions on subsequent demographic recovery, the chapter then offers the established population estimates for England. It also outlines the possible shape of the Scottish population throughout the late medieval period. As stated above, there are no annual estimates of the Flemish and Brabantine populations, but I create population benchmarks for Brabant, from which I deduce annual population estimates. There is also reasonable evidence to suggest that the size of the population was similar in Flanders, which leads me to use the same method to provide annual estimates for the Flemish population. Using the mint output and annual population data, I present estimates of the per capita money supply in England, and the per capita mint output in England, Flanders and Brabant. By establishing the debasement policies, mint outputs, and possible population sizes of each region, this chapter provides the groundwork for the subsequent analyses of prices, wages and rents. In doing this, it also offers a preliminary demonstration of the

extent to which England's economic foundation was different from those of Scotland and the southern Low Countries.

Chapter 3 employs this data in order to examine the place of England's economy within the wider context by examining the impact of demographic and monetary factors on commodity prices. I first outline the price trends that emerge from an examination of individual commodities. The rest of the chapter uses regression analysis to determine whether the price trends are best explained by population levels, debasement, mint output or crop yields. I also incorporate non-quantifiable factors by discussing various political, trade and social conflict shocks which might have contributed to short-term price fluctuations. An overview of the conclusions is offered by comparing the established baskets of consumables calculations for England, Flanders and Brabant. For Scotland, I apply the weighting of a sixteenth-century basket to the Gemmill and Mayhew price data.¹¹⁶ Regression analysis is run on the data, which looks at the extent to which population, money stock, mint output and debasement can be accredited with the movements in general price levels. I also examine the impact of harvest performance on prices by using r^2 to measure volatility. The short-term impact of politics, trade and conflict is also given due attention.

Chapter 4 looks at rents and wages and adopts a similar approach to that of Chapter 3. It offers regression analysis for the English and Low Countries rent and wage data to

¹¹⁶ Gemmill and Mayhew, *Changing Values*.

test the influence of monetary and demographic factors. Scottish rents and wages compiled from the records of Coupar Angus Abbey are used to further support the conclusions. Finally, I also examine the relationship between prices and wages by discussing real wages.

The first part of Chapter 5 offers a discussion of the implications arising from the previous chapters, analysing the extent to which England's economy differed from those of Scotland, Flanders and Brabant. It also examines how England's money, price, wage and rent trends were able to differ from the general patterns seen elsewhere. The second half of the chapter presents a conclusion to the thesis as a whole, highlighting the key findings, and offering routes for further research.

This thesis differs from the previous studies of prices, wages and rents in a number of ways. First, the inclusion of Scotland sets my work apart from Munro's comparisons of prices and wages in England and the Low Countries. My work further builds on the methods used by Munro because population figures are employed in the regression analysis. The inclusion of rents also broadens the study, for few economic historians have given them the same consideration as prices when examining the driving forces of demographic and monetary factors—let alone used them as part of a comparative study. Indeed, it is the breadth and detail of the comparison which makes this work different and significant. By placing England's economy within the wider context of her trading partners—and by including data that was unavailable in the work of previous economic historians—this thesis offers a fresh look at the monetarist and demographic interpretations of the post-Black Death economy.

Importantly, this thesis seeks to provide a *general* overview of the available price, wage and rent data for each country. Time and word limit constraints have made it impossible to consider the impact of regional variations within each country, and I have therefore relied upon the main datasets for each. This has meant that, rather than taking the entirety of the Burgundian Netherlands, I have used data for just Flanders and Brabant in the southern part of the Low Countries. The greatest availability of data for England falls within the south/south east part of the country, which is why this data forms the basis for comparison with Scotland and the southern Low Countries. For Scotland, it is in the eastern parts where the most data exists, on account of the bulk of price sources being from Aberdeen. However, though the data from these areas is taken as a general overview of prices, wages and rents in the thesis, this is not intended to suggest that there was no regional variation at all. Indeed, works by Gemmill and Mayhew; and Gemmill, Dodds and Schofield in particular highlight that price levels in Durham might not have entirely reflected the trends found in southern England.¹¹⁷ Likewise, Gemmill and Mayhew have also suggested that regional variation of prices probably existed in Scotland. It is likely that prices would have varied on the basis of local availability, leaving one to assume that in areas where a particular commodity was produced in quantity, its price level might well have been lower than commodities which were not produced locally: Gemmill and Mayhew suggest that salmon were cheaper in Aberdeen while Crail was a source of ‘plentiful and cheap’ herring.¹¹⁸ Likewise, we might expect that demand for certain professions

¹¹⁷ Gemmill and Mayhew, *Changing Values*; E. Gemmill, B. Dodds and P. Schofield, ‘Durham Grain Prices, 1278–1515’, *Archaeologia Aeliana*, Ser. 5, Vol. 39 (2010), pp. 307–27.

¹¹⁸ Gemmill and Mayhew, *Changing Values*, p. 14.

was greater in some areas than others, and thus it is likely that regional variation existed in wage rates—indeed, as I will discuss in Chapter 4, London wages were higher than rural wages. As I also discuss in Chapter 4, it is likely that the location and nature of property would have had an impact on the rental value, and therefore we would also expect to find regional variation in the value of rents. Thus, while this thesis intends to provide a new perspective on prices, wages and rent values in England by considering these data within the context of Scottish, Flemish and Brabantine data, it will be the task in future work to broaden the comparisons to a region-by-region approach to test the extent to which the conclusions offered in this thesis apply to the northern/western regions of the countries.

CHAPTER 2: MONEY AND POPULATION

The purpose of this chapter is twofold: it sets out the currency, mint output and population data necessary for the analysis of prices, wages and rents in subsequent chapters; and it offers preliminary conclusions about how England's economy appears atypical when compared to Scotland and the southern Low Countries.

As we have seen, money could impact on prices in two ways: through changes in its quality and through changes in the quantity available.¹¹⁹ To address the question of quality, this chapter begins by examining the relative exchange rates of England and her main trading partners. England's currency appears to have held its value better than others, which is shown to be the result of her moderate approach to debasement. This was enabled by England's consistently positive balance of payments, while Scotland and the southern Low Countries probably suffered from a negative balance of payments.¹²⁰ However, money was also crucial to the domestic market, and after establishing that its intrinsic value was less important at home than abroad, I offer an overview of the changes made to the main denominations used in England, Scotland, Flanders and Brabant. It emerges that England's policy of moderate debasement came with a tendency to maintain proportional value between denominations, which was not the case in the other countries. By not maintaining proportionality between gold and silver denominations, Scotland and the southern Low Countries offered varying relative prices for their gold and silver. The nature of a commodity money system meant that this could have had an effect

¹¹⁹ See Section 1.2 above.

¹²⁰ See Section 2.1 below.

on the availability of gold and silver coinage in each country.

It is also crucial to gain an impression of the quantity of available money in England, Scotland and the southern Low Countries. Though substantial money stock estimates exist only for England, it is possible to get an idea of the availability of money by looking at mint output. We shall see that England's policy of moderate and infrequent debasement presents itself in the form of cyclical mint output, where the peaks and troughs of output followed a fifty-year cycle. Particular biases towards gold or silver mint outputs manifest themselves during periods of pronounced shift in her trading partners' bimetallic ratios. In Scotland and the southern Low Countries, on the other hand, the likely outflow of bullion caused by a negative balance of trade would have meant that their mints operated under a policy of heavy debasement. Scotland's mints still struggled to attract bullion in the fifteenth century, but in Flanders and Brabant debasement kept output high, as favourable mint prices incentivised merchants to bring bullion to the mints. However, that did not stem the outflow of bullion, and thus not only Scotland but also Flanders and Brabant used black money to ensure that there was sufficient currency for domestic exchange.

Chapter 1 emphasised that this thesis seeks to examine the impact of demographic factors on prices, wages and rents, as well as the effects of money. Consequently, this chapter also considers the known population trends of each 'country'. After establishing the impact of the Black Death in each case, the subsequent recovery of each population is compared. As with money stock estimates, this data is plentiful for England. Estimates

for Scotland, however, are very general, though the historiography suggests that the Scottish population was already beginning to recover in the earlier fifteenth century. As for the Low Countries, by using Brabantine city and countryside data as a proxy, I offer estimates of the Flemish and Brabantine populations derived from the work by Herman van der Wee and Prevenier and Blockmans on mid fifteenth-century hearth taxes. My findings show that, as in Scotland, the population had begun to recover during the first half of the fifteenth century. England was therefore unique in having persistently low population levels throughout the fifteenth century, and we shall explore the implications of that fact.

Finally, by using estimates of Flemish and Brabantine population levels, and the established English figures, this chapter offers a comparison of per capita mint outputs. Comparison of England's per capita mint output with the per capita money stock shows that while her mints produced fewer kilograms of bullion per capita than the Flemish and Brabantine mints, her positive balance of trade was instrumental in the accumulation of a substantial high-value money stock. By the same measure, the negative balance of trade caused by the southern Low Countries' reliance on imports of foodstuffs meant that the higher per capita mint output was probably more than offset by bullion exports through trade. This reconciles the heavy production of black money in the Low Countries with the high mint output. Thus, it is apparent that England's persistently low population—combined with a constant balance of payments surplus—enabled her to operate a unique policy of monetary 'maintenance'. In contrast, her trading partners were forced to use debasement to fight against a constant outflow of bullion and ensure that their

expanding populations had access to an adequate supply of money in the fifteenth century.

2.1 THE VALUE OF MONEY

2.1.1 THE PICTURE OF THE MEDIEVAL EUROPEAN CURRENCIES

Medieval Europe functioned with a commodity money system, which made the *quality* of each country's currency more illustrative of economic performance than modern fiat currencies.¹²¹ Coins were generally struck from silver and, later, gold, but copper was also used occasionally. Commodity money was subject to wear, tear and wastage, meaning that if coins were not reminted, those in circulation would gradually get lighter or be lost, thereby increasing the value of bullion. Silver coins circulated with greater frequency than gold coins; consequently silver needed reminting more frequently than gold.¹²² Silver coins were also more prone to loss than gold coins. Coins were also often clipped (where the edges were shaved off and the bullion dust obtained was used to produce counterfeit coins), which also reduced their weight. With all these factors combined, economic historians have estimated that wear, tear and wastage of silver coins amounted to between 1% and 4% per decade.¹²³ It was therefore necessary for mints to have a steady supply of

¹²¹ See p. 20 for a definition of a commodity money system. In contrast, a fiat money system derives no worth from intrinsic value and instead is assigned value by the issuing body. See C. Desan, *Making Money: Coin, Currency, and the Coming of Capitalism* (Oxford, 2014), pp. 29–33.

¹²² D. J. Henstra, *The Evolution of the Money Standard in Medieval Frisia: A Treatise on the History of the Systems of Money of Account in the Former Frisia (c.600–c.1500)* (Groningen, 2000), p. 33; C. van Hengel, 'Wear of Silver Coins', *Jaarboek voor Munt- en Penningkunde*, Vol. 69 (1982), pp. 139–45.

¹²³ Mayhew, 'Numismatic Evidence', pp. 2–3; N. J. Mayhew, 'The Quantity Theory of Money', *The Numismatic Chronicle*, Vol. 172 (2012), pp. 397–403; Allen, *Mints and Money*, pp. 333–5; van Hengel, 'Wear of Silver Coins', p. 144; T. H. Lloyd, 'Overseas Trade and the English Money Supply in the Fourteenth Century', in N. J. Mayhew (ed.), *Edwardian Monetary Affairs (1279–1344): A Symposium Held in Oxford, August 1976*, *BAR*, Vol. 36

bullion to maintain the money system. The commodity money system thus meant that when the supply of bullion dried up, the government would have needed to debase the currency, lest the quantity of money contract.¹²⁴ A reduction in the quantity of money could have caused reduced liquidity, which in turn might have encouraged recession. There were two main methods by which a country could obtain bullion for its mints: either through mining or, if mining was not possible, by running a positive balance of trade.¹²⁵

England did not have a great deal of success with silver mining during the later middle ages, though it was in a stronger position than Scotland, which did not appear to have any serious mining operations during the late middle ages.¹²⁶ Flanders and Brabant were worse off still, for they had no native supplies of gold or silver.¹²⁷ The mines of Devon and Cornwall had provided an important source of silver in the twelfth century, but a number

(Oxford, 1977), p. 109.

¹²⁴ Debasement just silver or gold, not both together, also had the added benefit of shifting the bimetallic ratio, the relative value of gold versus silver. If the silver currency was debased heavily but gold left untouched, the value of silver would increase relative to gold. Thus, in this scenario, it would be expected that foreign merchants might bring more silver to the mints.

¹²⁵ Debasement also attracted bullion to the mints because it offered a more favourable price for the metal. However, involvement in trade was still necessary because merchants were unlikely to go too far out of their way to purchase debased coins. Furthermore, excessive debasement could erode confidence in the currency and thus cause a flight from debased currency to harder currency. This would mean that bullion would stop flowing to the mints. This was the case in early sixteenth-century Scotland. See Gemmill and Mayhew, *Changing Values*, p. 134. Excessive debasement could also cause credit to dry up, as was the case in the Low Countries during the 1480s. See H. van der Wee, *The Growth of the Antwerp Market and the European Economy (Fourteenth–Sixteenth Centuries)* (3 vols, The Hague, 1963), ii, p. 106. Consequently, I do not believe that debasement was an infallible method of obtaining bullion for the mints or maintaining the size of the money stock.

¹²⁶ There are few references to the Scots obtaining silver through mining. David I's capture of Carlisle in the twelfth century gave him control over the mine at Alston. A. Taylor, *The Shape of the State in Medieval Scotland, 1124–1290* (Oxford, 2016), p. 390.

¹²⁷ D. Nicholas, *Medieval Flanders* (London, 1992), p. 375.

of failed attempts to exploit them for profit reduced their importance in the thirteenth century and beyond.¹²⁸ Once the Black Death struck England, most of the mining operations were closed down until a few desperate attempts were made to revive the Devon mines in the middle of the fifteenth century. However, even during the period of low mint output in 1445–51, Devon silver only formed 9.8% of the silver output of the English mints and frequently made up less than 1% of annual silver output in the late fourteenth and fifteenth centuries.¹²⁹ On the Continent, silver flowed from the silver mines in Hungary, Silesia, Germany (the Harz and Meissen, in Saxony), and from Bohemia, to Flanders, Brabant and the Champagne Fairs.¹³⁰ This silver would eventually make its way into England and Scotland when foreign merchants bought English and Scottish goods.¹³¹ The fifteenth century brought a decline in general mine outputs in Central Europe. The silver mine at Kutná Hora (Bohemia) was declining after the Black Death, and the Hussite wars of the early fifteenth century stopped silver production altogether. This was in conjunction with the sudden end to Sardinian silver output in 1365 during the war of rebellion against the Aragonese.¹³² Not until the second half of the fifteenth century did mining

¹²⁸ For example, the Frescobaldi leased the mines of Bere Ferrers in west Devon and the Combe Martin mines in north Devon in 1299. The Frescobaldi abandoned the endeavour after less than two years, and left the mine in a bad state. Allen, *Mints and Money*, pp. 244–5.

¹²⁹ Allen, *Mints and Money*, pp. 245, 252.

¹³⁰ J. U. Nef, 'Mining and Metallurgy in Medieval Civilisation', in E. Miller, C. Postan and M. M. Postan (eds), *The Cambridge Economic History of Europe from the Decline of the Roman Empire, Volume 2: Trade and Industry in the Middle Ages* (Cambridge, 1987), p. 701. The German Harz and Meissen mining areas were particularly important. Spufford, *Money and Its Use*, pp. 136–8.

¹³¹ Indeed, Scotland became reliant on foreign silver because the output of Alston had not been enough to permanently increase the money supply, not least because Cumberland was not in Scottish hands for long. Thus, Scotland obtained silver from the circulation of English coins, as well as those from the Continent. Taylor, *Medieval Scotland*, pp. 394–5.

¹³² Spufford, *Money and Its Use*, p. 343; Day, 'Bullion Famine', p. 35.

enjoy a revival, with the South German discovery that silver could be extracted from argentiferous copper ores, and with new silver mines in the Balkans and Germany once again adding to the silver stocks of Europe.¹³³ Other technological advances, such as improvements to furnaces and bellows (which allowed for the production of better tools) also helped to increase mining output in central Europe. Taken together, these new discoveries led to a fivefold increase in the production of the mines between 1460 and 1530, which equated to an output of 90,000 kilograms per year.¹³⁴

The decline of mining in the late fourteenth and fifteenth centuries meant that the main source of bullion was through trade—and thus England, Scotland, Flanders and Brabant became engaged in competition for control of the existing and fixed supply of silver. England was fortunate insofar as her balance of payments always remained positive, mostly benefitting from a combination of strong wool and cloth exports combined with a minimal need to import staples from abroad. Indeed, Bolton shows that even in the crisis period of 1452–61, England’s annual average balance of payments was positive, with £8,958 net bullion coming in from trade; see Figure 2.1.¹³⁵

¹³³ Munro, *Wool, Cloth, and Gold*, p. 157; Day, ‘Bullion Famine’, pp. 40–1. The mines at Schneeberg and Schwaz enjoyed high output in the 1470s and 1480s. See J. U. Nef, ‘Silver Production in Central Europe, 1450–1618’, *The Journal of Political Economy*, Vol. 49, No. 4 (1941), p. 578.

¹³⁴ H. A. Miskimin, *The Economy of Later Renaissance Europe, 1460–1600* (Cambridge, 1977), pp. 32–3.

¹³⁵ Bolton, *Medieval English Economy*, p. 307. Whether the bullion coming in from trade was in the form of gold or silver depended on the bimetallic ratio at the time. See Figure 2.9 below, on p. 81.

<i>Year (Mich.–Mich.)</i>	<i>Imports (£)</i>	<i>Exports (£)</i>	<i>Annual Average Balance of Payments (£)</i>
1386–99	195,000	252,000	57,000
1421–31	106,645	166,687	60,042
1431–42	129,436	136,556	7,120
1442–52	139,154	157,256	18,102
1452–61	105,880	114,838	8,958

FIGURE 2.1

The English Balance of Payments

[Lloyd, 'Overseas Trade', p. 120; Bolton, *Medieval English Economy*, p. 307.]

England's buoyant export trade appears to have been unique, for there is no evidence to suggest that either Scotland or the Low Countries enjoyed a steady inflow of bullion. Though much of the money coming into Flanders through trade was brought in via the selling of Flemish cloth, from the 1320s onwards the industry began to decline. Flemish cloth had been reliant upon the supply of high-quality English wool, but, according to van Werveke, the arrival of Italian galleys supplied Florence directly with English wool, allowing the Florentines to produce more of their own cloth and bypass the Flemish cloth industry.¹³⁶ Numerous conflicts between the Flemish weavers and fullers punctuated the narrative of the fourteenth century: evidence of civic discontent, which is always more common in times of economic strife. Finally, in the latter part of the fourteenth century, the decline of the Champagne Fairs was combined with interruptions in the supply of English wool (caused by French embargoes), which finally led to the long-overdue collapse of the Flemish cloth industry in the 1390s.¹³⁷ Though we have little import data for

¹³⁶ H. van Werveke, 'Industrial Growth in the Middle Ages: The Cloth Industry in Flanders', *EconHR*, Vol. 6, No. 3 (1954), pp. 241–4; For the rise of the luxury cloth industry in Italy, see J. H. Munro, 'The Rise, Expansion, and Decline of the Italian Wool-Based Textile Industries, 1100–1730: A Study in International Competition, Transaction Costs, and Comparative Advantage', *Studies in Medieval and Renaissance History*, 3rd ser., Vol. 9 (2012), pp. 45–207.

¹³⁷ Pounds, *Economic History*, p. 452.

Scotland, a comparison of English and Scottish woollen product exports shows that English exports did not decline as badly as Scottish exports in the fifteenth century [Figure 2.2]. Importantly, during the fifteenth century, English exports were commonly more than six times higher than Scottish exports. If the Scottish population was about a sixth of the size of the English population, then per capita exports were higher in England than Scotland in the fifteenth century. England's exports were centred around high-quality wool and cloth, but Scottish exports were more commonly lower-quality wool and cloth, salmon, herring and other raw goods. Though the Scottish wool exports benefitted from the renewal of the Anglo-Flemish dispute in the early 1370s, when the wool exports rose by 40%, they suffered from the late fourteenth century onwards.¹³⁸ In the 1390s many of the major Flemish draperies banned the use of Scottish wool in higher-quality manufactures.¹³⁹ The consequence was a decline in Scottish exports. Aberdeen, which had retained a reasonable portion of the wool export trade up to the sixteenth century, saw the number of ships departing from its harbours fall. Between the periods 1327–33 and the 1410s, ships carrying Scottish exports were reduced to fewer than an eighth of their previous number.¹⁴⁰

¹³⁸ T. H. Lloyd, *The English Wool Trade in the Middle Ages* (Cambridge, 1977), p. 255; Grant, *Independence and Nationhood*, p. 236.

¹³⁹ A. W. K. Stevenson, 'Trade Between Scotland and the Low Countries in the Later Middle Ages' (unpublished PhD thesis, University of Aberdeen, 1982), p. iii. As has been stated on p. 47, the Flemish cloth industry also collapsed at the end of the fourteenth century, which almost certainly contributed to the decline of both English and Scottish wool exports.

¹⁴⁰ D. Ditchburn, 'Cargoes and Commodities: Aberdeen's Trade with Scandinavia and the Baltic, c.1302–1542', *Northern Studies*, Vol. 17 (1990), pp. 17–18.

In return for her declining raw material exports, Scotland was an importer of manufactured goods, which were more expensive than unmanufactured goods on account of rising wages across western Europe.¹⁴¹ Since Scotland was exporting raw materials and importing manufactured goods, maintaining a positive balance of payments would have been very difficult.¹⁴² The imbalance of trade drained bullion from Scotland, resulting in numerous attempts by the Scottish Crown to stem the outflow of gold and silver by demanding that a certain quantity of bullion be brought to Scotland for every sack of wool exported.¹⁴³ Frequent repetitions of this legislation speak of a failure to rectify the bullion outflow.¹⁴⁴

It is therefore likely that Scotland was a net importer and operated with an unhealthy

¹⁴¹ A captured ship in 1394 was laden with woollen and linen cloth, canvas, wax, pepper, saffron, ginger, brass pots and plates, to name but a few high-cost items. Interestingly, there is also evidence to suggest that the value of imports was sometimes dishonestly declared—the ship's contents were worth over £170 sterling, but the ship and its cargo had been valued at just £13 6s. 8d. Grant, *Independence and Nationhood*, p. 71.

¹⁴² Grant also suggests that Scotland was suffering from balance of payments difficulties after 1390. This was partly the result of falling exports, and partly caused by 'exchange rate difficulties' during the 'general European recession'. See Grant, *Independence and Nationhood*, p. 72. Indeed, the Scottish parliament remarked in 1473 that there was 'a great scarcity of bullion existing in the realm'. *The Records of the Parliaments of Scotland* [RPS], <<http://www.rps.ac.uk>> (23 February 2018), 1473/7/15. In 1478 the Scottish parliament noted that there was a scarcity of both old Scottish money and foreign money, which gives further weight to the argument that Scottish exports could not offset imports. *RPS*, 1478/6/81.

¹⁴³ I. D. Whyte, *Scotland Before the Industrial Revolution: An Economic and Social History, c.1050–1750* (London, 1995), p. 78.

¹⁴⁴ The earliest reference to forbiddance of bullion export appears to have been in 1370. See *RPS*, 1370/2/10 and 1370/2/9. It was reiterated in 1385 [*RPS*, 1385/6/3], 1398 [*RPS*, 1398/2; *RPS*, 1398/18], 1424 [*RPS*, 1424/12, *RPS*, 1424/13; *RPS*, 1424/14; *RPS*, 1424/15], 1430 [*RPS*, 1430/28], 1436 [*RPS*, 1436/10/8], 1450 [*RPS*, 1450/1/29], 1451 [*RPS*, 1451/10/16], 1464 [*RPS*, 1464/1/5], 1466 [*RPS*, 1466/39], 1468 [*RPS*, 1468/4], 1473 [*RPS*, 1473/7/15]. The lack of bullion seems to have persisted throughout the fifteenth century, with renewals commonly occurring at least once a decade.

balance of payments.¹⁴⁵ This was not a unique situation in north-western Europe, for Flanders is also thought to have been a net importer.¹⁴⁶ Its imports were diverse throughout the late medieval period. As early as the late thirteenth century, there is evidence of Flanders importing fur, bees wax, copper, gold and silver from Poland.¹⁴⁷ The southern Low Countries was also forced to import foodstuffs because, even though the countryside was highly fertile, it could not produce enough to feed its densely populated cities.¹⁴⁸ There was also a long-established trade relationship between England and Flanders. Until the collapse of the Flemish cloth industry at the end of the fourteenth century, there had been great demand for high-quality English wool. England also exported grain and other foodstuffs, like cheese and fish.¹⁴⁹ Of course, Flanders' and Brabant's balances of payments almost certainly declined after the collapse of the cloth industry; no longer were the Flemish and Brabantines profiting from the value added of converting wool to cloth because now they imported it in its final—more costly—form from England.¹⁵⁰

¹⁴⁵ D. Ditchburn, 'Trade with Northern Europe, 1297–1540', in M. Lynch (ed.) *The Scottish Medieval Town* (Edinburgh, 1988), p. 176; A. Stevenson, 'Trade with the South, 1070–1513', in Lynch (ed.) *Scottish Medieval Town*, p. 198; Gemmill and Mayhew, *Changing Values*, p. 374.

¹⁴⁶ Nicholas, *Medieval Flanders*, p. 296.

¹⁴⁷ M. Malowist, 'Polish–Flemish Trade in the Middle Ages', *Baltic and Scandinavian Countries*, Vol. 4, No. 1 (1938), p. 3.

¹⁴⁸ Miskimin, *Later Renaissance*, pp. 52–3.

¹⁴⁹ E. Miller and J. Hatcher, *Medieval England: Towns, Commerce, and Crafts, 1086–1348* (London, 1995), p. 193. On 26 January 1416, John Spencer was given permission by Henry V to export 500 quarters of barley to Holland and Zeeland on the condition that he pay the ordinary tolls. H. J. Smit, *Bronnen tot de geschiedenis van den handel met Engeland, Schotland en Ierland* (2 vols, 's-Gravenhage, 1928), i, p. 579 quoting PRO Treaty Roll 3 Henry V, membr. 4.

¹⁵⁰ The wool and cloth trade was a key component of Anglo-Burgundian friction in the fifteenth century. The ordinance demanding that English wool and cloth be paid for upfront (rather than in credit) had halted trade for four years from around 1435. The ordinances were renewed in 1445 and 1463, which led to two (mostly unsuccessful) embargoes from the duke of Burgundy in 1447–52 and 1464–7. See J. Kermode, *Medieval Merchants: York, Beverley, and Hull in the Later Middle Ages* (Cambridge, 1998), p. 166.

FIGURE 2.2
English and Scottish Total Woollen Exports, 7-Year Moving Averages
[M. Rorke, 'English and Scottish Overseas Trade: 1300–1600', *EconHR*, Vol. 59, No. 2
(2006), p. 275.]

Of course, England did import a number of commodities in the late fourteenth century and beyond. However, what differentiated England from the others was the fact that, for essential consumer goods, it was largely self-sufficient and did not seem to import luxury goods in as great a quantity as elsewhere.¹⁵¹ Imports of wine came from Gascony in the mid fourteenth century, but wine was not an essential foodstuff when there

¹⁵¹ In January 1394, the commons negotiated with the king to allow for common passage of ships exporting corn, agreeing to pay duties. This came as the commons complained that they could not earn enough money selling grain in England alone, suggesting that there was an abundance of grain. See *Parliament Rolls of Medieval England* [henceforth *PROME*], ed. C. Given-Wilson, P. Brand, S. Phillips, M. Ormrod, G. Martin, A. Curry and R. Horrox (Woodbridge, 2005), *Scholarly Digital Editions* (25 June 2018), iii, 320. In February 1426, Kent complained that they had been reliant on exporting grains to Calais and Picardy, but this had been hindered by the new requirement to obtain a licence from the chancellor, to the impoverishment of those involved in the trade, see *PROME*, iv, 307. In January 1437, there were further demands made in the commons to make the export of foodstuffs easier. See *ibid.*, iv, 500. During the famine years of the late 1430s, it was stated that the enforcement of export prohibitions had become so strict that it was impossible to transport grain by water, lest it be exported out of the realm. The consequence was that towns with an abundance of grain were unable to send food to those suffering from famine, *ibid.*, te, v, 31. In February 1445, the king was willing to grant passage of grain out of the country, save to enemies of the realm, as long as customs duties were paid, *ibid.*, te, v, 107. Given that the majority of the complaints mentioned foodstuffs

was plenty of ale.¹⁵² Unlike Scotland and the Low Countries, therefore, England was not vulnerable to trade deficits caused by a need to import essential foodstuffs. Her vulnerabilities instead came from political conflict and trade disruption. The parliament of 1379 heard that the country was suffering from a general lack of bullion, seemingly because it was being withdrawn from circulation. Parliament's solution was to enact an ordinance to prohibit the export of bullion, as the commons demanded that the money should remain 'good and strong and of sound quality'.¹⁵³ Legislation preventing the export of bullion would have been easier to enforce in England (and Scotland) than in the Low Countries, owing to the lack of land borders—ships leaving British ports could be more easily inspected than individuals crossing land borders on the Continent. In 1380 it was remarked that there was no money from wool subsidies that year, due to the uprising in Flanders. The result had been soldiers' wages in Calais falling into arrears over the previous nine months, and the king being deep in debt.¹⁵⁴ However, though conflict did have a negative effect on England's bullion inflow, it posed a much less significant long-term threat to the balance of payments than a reliance on essential foodstuff imports.

It is thus unsurprising that England's silver currency enjoyed a much more stable international exchange rate valuation than those of her trading partners, Figure 2.3.¹⁵⁵ The

being sold at very low prices, it is a reasonable assumption that England was able to produce a surplus of grain and livestock. Indeed, the parliaments of the fifteenth century became increasingly protectionist, with Edward IV's parliament of April 1453 stating that the import of foreign cloth was forbidden in order to protect English jobs, and the import of foreign grain was only allowed when the domestic prices surged, presumably during times of dearth. *Ibid.*, v, 500–4.

¹⁵² *Ibid.*, ii, 261.

¹⁵³ *Ibid.*, iii, 64.

¹⁵⁴ *Ibid.*, iii, 88.

¹⁵⁵ Note that England's currency shows a straight line because one English shilling was always equal to one

rates are based on those quoted by merchants in different cities. Though there is some inevitable data distortion caused by unusually harsh or generous exchange rates, as well as from decades with less data, the overall conclusion is striking. All currencies lost value against England, with Scotland, Flanders and France being the worst affected. Stability was slightly better for the Florentine *soldini* and *dinari*, but even these suffered erosion against the English sterling throughout most of the late medieval period.

However, by displaying all currencies in terms of the English sterling, I have quantitatively illustrated the issue with using England as the economic benchmark, but this is the very thing the thesis is designed to question, as outlined in Chapter 1! In fact, England's currency appears unusually, and perhaps unfairly, stable compared to the others. Therefore Figure 2.4 shows these same currencies in terms of the Florentine florin, the most stable coin in Europe, always weighing around 3.5 grams after the 1390s.¹⁵⁶ It remains

English shilling, and thus it acts as a benchmark. The Scottish rate is derived from the Anglo-Scottish exchange rate, to which I made some adjustment in my BA thesis because Spufford's rates had drawn on Gilbert's data, which mixed gold and silver currencies together. I found that mixing gold and silver gave a falsely low value for the Scottish currency; Gilbert's data showed an exchange rate of 1:4.5 in 1492, but my own calculations with silver alone gave nearer 1:3.55, nearly a whole pound's difference. See K. Ball, 'Economic Change in the Western North Sea Region in the Later Middle Ages' (unpublished BA thesis, Lancaster University, 2013), p. 10. I have also disregarded the Anglo-Scottish exchange rates of 1424 because the currencies have been listed at parity, which had not been the case since 1373. See J. M. Gilbert, 'The Usual Money of Scotland and Exchange Rates Against Foreign Coin', in D. M. Metcalf (ed.), *Coinage in Medieval Scotland (1100–1600): The Second Oxford Symposium on Coinage and Monetary History*, BAR, Vol. 45 (Oxford, 1977), p. 140.

¹⁵⁶ It had a brief spell of weighing 3.33 grams in the second half of the fourteenth century but was returned to its historical weight of c.3.53 grams. There was a brief attempt to strike light 3.33-gram florins in 1402, but this was abandoned. Throughout the fifteenth century, the weight of the florin does not appear to have deviated by more than 0.85%. Spufford and Wilkinson, *Handbook*, pp. 3–25. Note that I use the standard florin of c.3.5 grams, rather than the 'fiorino largo', which was larger and struck only from 1422 onwards. These exchange rates are derived primarily from mercantile exchange rates, as set out in Spufford and Wilkinson, *Handbook*. Some of the English data in the fifteenth century has been taken from Venetian ducat rates, converted into Florentine florins.

the case that England's silver currency was extremely stable throughout the late medieval period, only falling against the florin from the 1460s onwards. This fall in value from the 1460s is also seen in the other silver currencies, except for the Florentine *soldini* and *dinari*. The most striking observation is, therefore, that England's currency was unusually stable—the other silver currencies all generally fell into step, with Scotland and Flanders having particularly close trends. The Florentine silver denominations were still debased more than their gold counterparts, suggesting that there was a general issue with the availability of silver from the late fourteenth century onwards. Indeed, this is consistent with the 'bullion famine' narrative and Spufford's observation that the minting of silver stopped in Florence in 1393.¹⁵⁷ France's *livre tournois* fell in line with the general trend of steady devaluation after its aggressive monetary experimentation in the opening years of the Hundred Years War were brought to an end. There had been an initial return to stronger money in 1343, which was reinforced by the major return to stronger money in 1353.¹⁵⁸

On the international market, therefore, it appears that England's silver currency was unusual in the consistency of its high and stable valuation. For most of the fifteenth century, it resisted value erosion more effectively than the others, only declining towards the end of the century. If we are to consider the implications of monetary change on the price, wage and rent data, it is crucial to acknowledge that England's monetary founda-

¹⁵⁷ Spufford, *Money and Its Use*, p. 349.

¹⁵⁸ Spufford and Wilkinson, *Handbook*, pp. 177–8.

tion differs dramatically from those of Scotland and the southern Low Countries. However, these valuations have been derived from commercial sources, and while they might be highly pertinent to the value of imported goods, they might be less relevant to the values of domestically produced goods, wages and rents. Therefore, we must now examine how each country's currency was valued on its domestic market.

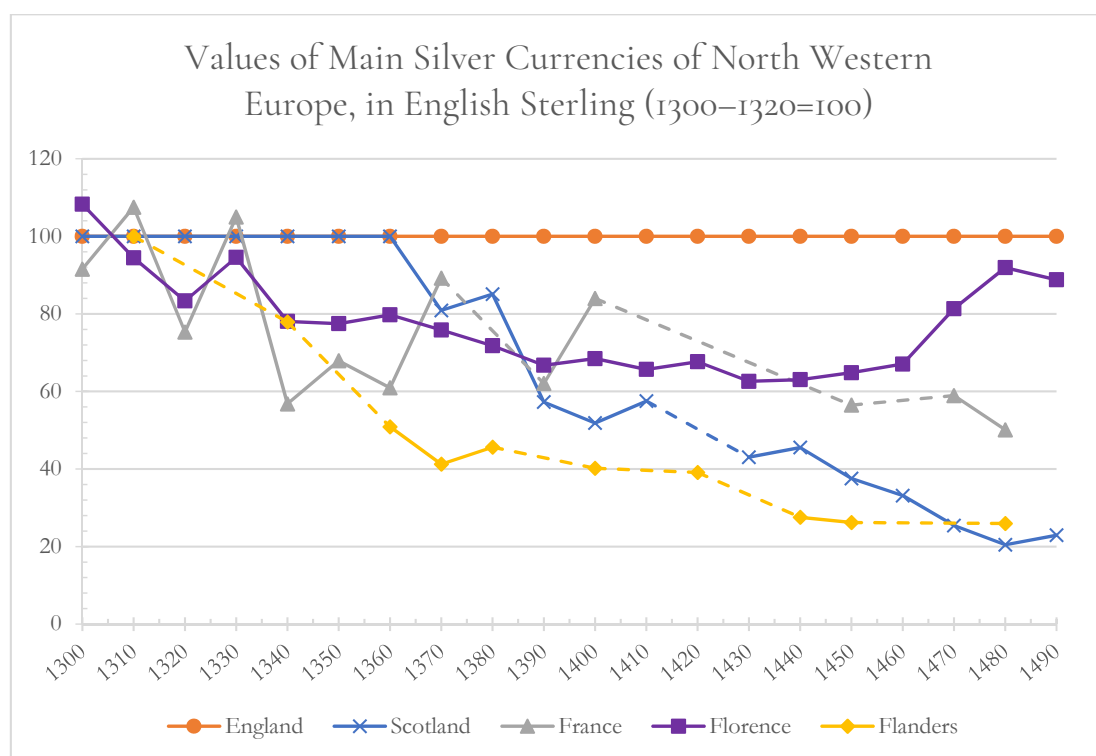


FIGURE 2.3

[P. Spufford and W. Wilkinson, *Handbook of Medieval Exchange* (London, 1986), pp. 3–25, 211–12, 172–9, 198–201, 201–6, 215–17; Gilbert, ‘Usual Money of Scotland’, pp. 140–2; Ball, ‘Economic Change’, p. 10.]

2.1.2 THE VALUATION OF THE CURRENCIES OF ENGLAND, SCOTLAND, AND THE SOUTHERN LOW COUNTRIES

In order to understand the interaction of money within the domestic economy, and the impact that governmental changes to the currency might have had, it is first necessary to

settle the issue of currency valuation. This will involve some further discussion of its international convertibility. It has already become apparent that, on the international market, English currency was valued with greater consistency and stability than those of her trading partners. However, the previous section explored only the valuations of each currency based on mercantile exchange rates. This section will highlight how the bullion weight of each currency differed from the impression gained from exchange rates, before showing that the value of money was also handled differently on the domestic and international markets. Finally, it will also offer a brief discussion of the ‘tale’ and ‘weight’ debate.

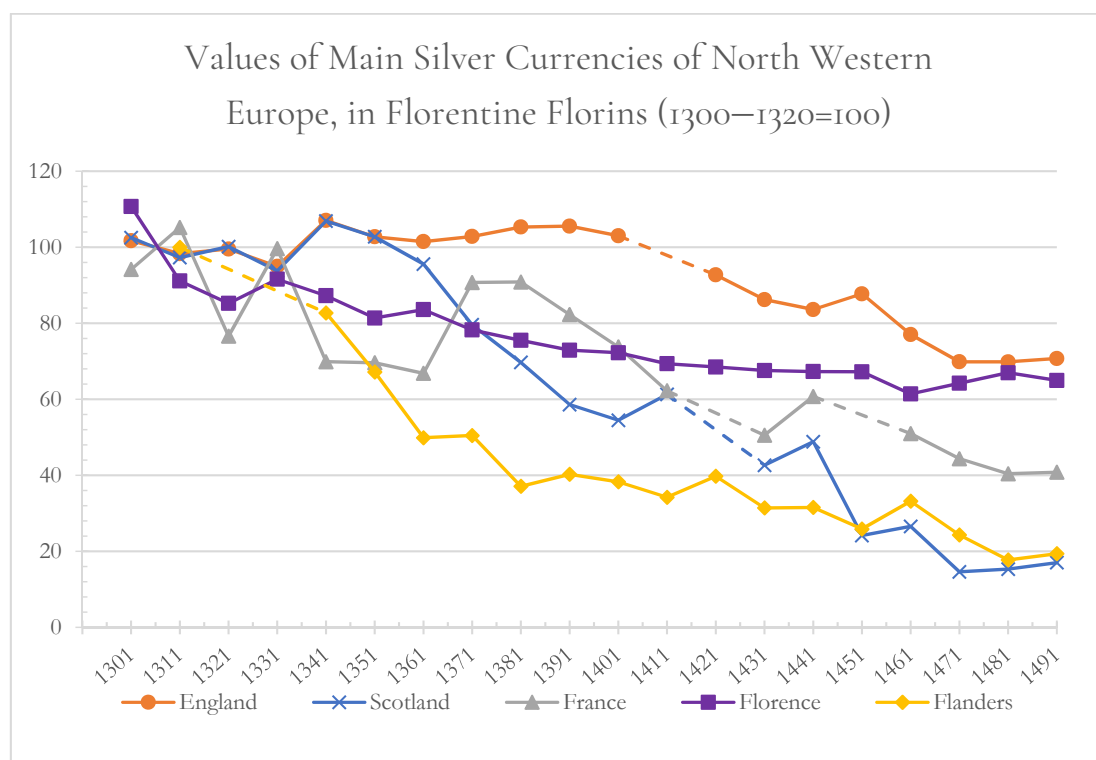


FIGURE 2.4
[As Figure 2.3]

In terms of the amount of bullion in each penny, the English silver currency was heavier than those of Scotland and the Low Countries, Figure 2.5.¹⁵⁹ It is also evident that the trends of debasement were far smoother than swings in the exchange rate [Figure 2.4], which tended to be more volatile. This was almost certainly because there was some variation between exchange rates quoted by merchants, in the same way that modern foreign currency quotes vary slightly between bureaux. Though it is clear that Flanders, Brabant and Scotland saw frequent debasement, there are only three periods in which England also debased with the others: the 1410s, the 1460s and the 1520s. Indeed, the 1410s sits at the end of the bullion famine, and the 1460s at the close of the so-called mid fifteenth-century 'slump' and just before the silver mines in Europe began to increase output again. What is evident from the data is that England, unlike the others, did not have a policy of consistently debasing throughout these crisis periods.

Figure 2.5 highlights that the most common adjustments made to the silver coinages were reductions through debasement. There were three ways in which the intrinsic value of a coin could be lowered: its weight could be reduced, its fineness could be reduced, or its face ('tale') value could be increased. All three had the effect of increasing the value of the bullion.¹⁶⁰ It should therefore be apparent that the commodity money system meant

¹⁵⁹ Indeed, England had always preferred to operate a policy of high taxation but hard currency, whereas debasement was used as a form of royal revenue on the Continent, particularly in France. See Spufford, *Money and Its Use*, p. 302; Desan *Making Money*, pp. 154–63.

¹⁶⁰ For example, if a 1d. coin contains 10 grains of silver, but the weight is reduced to 5 grains, then 1d. is now worth half what it was before, therefore doubling the value of silver. The same effect could be achieved by increasing the value of this 1d. coin to 2d.

that coins had two potential values—their ‘weight’ value and their face (‘tale’) value. However, the use of these values was not consistent across international and domestic markets, or even across denominations. Therefore, it is now essential to address how coins circulated on the domestic and international markets, because this could impact on how prices, wages and rents reacted to monetary changes.

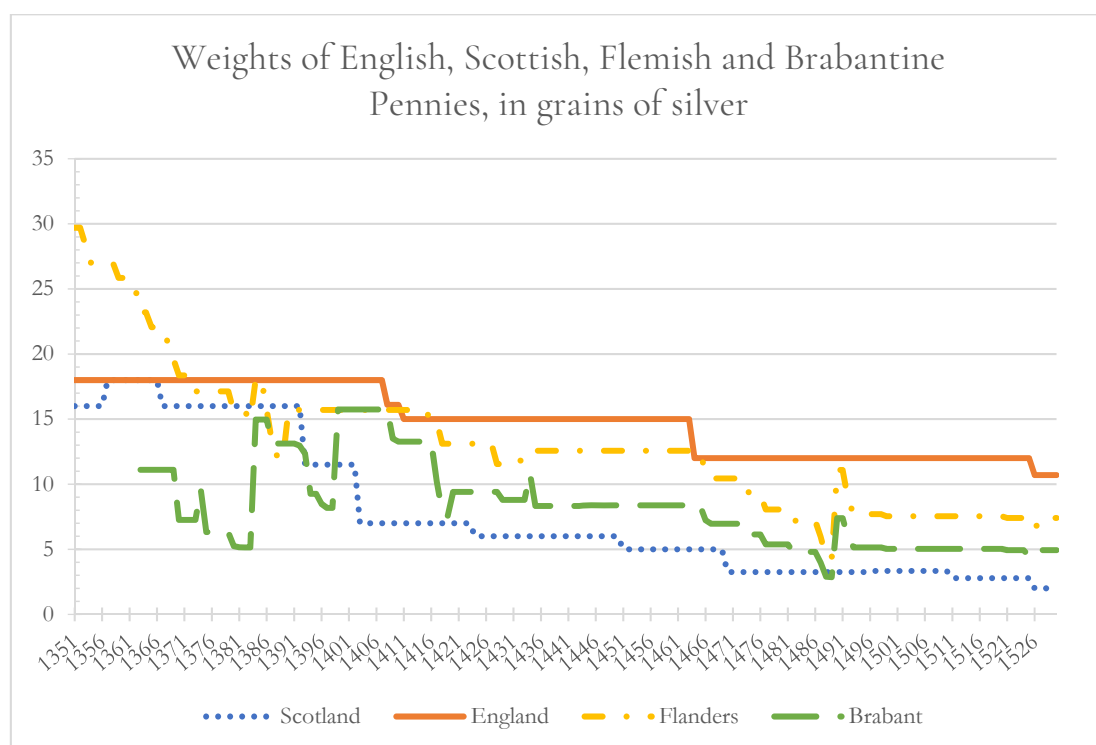


FIGURE 2.5

[Gemmill and Mayhew, *Changing Values*, pp. 111–42; Stewart, *Scottish Coinage*, pp. 132–48; Grant, *Independence and Nationhood*, p. 240; Allen, *Mints and Money*, p. 154; van der Wee, *Growth of the Antwerp Market*, i, pp. 124–9; Munro, *Wool, Cloth, and Gold*, pp. 209–11. Note that the Scottish penny weights are theoretical from the start of the fifteenth century, and thus slight variations in proposed weight will arise depending on the denomination used to derive the weight. I derived the Flemish *groot* weight for the 1520s from the Brabantine *groot* weight, using the ratio 1:1.5 shown in van der Wee, above.]

Gold was the main metal used for international payments, whereas silver was predominantly favoured for domestic transactions.¹⁶¹ It is therefore generally accepted that gold coins were significantly more likely to have been taken by weight, no doubt because their use in international trade encouraged merchants to check the value of large payments.¹⁶² Thus, in cases where gold was debased or worn, its value was liable to adjustment on the market. For example, in the early fifteenth century, clipped gold nobles were so prevalent in England that full-weight nobles commanded an inflated value of 7s. 10d.¹⁶³ It is also likely that silver was taken by weight on the international market. This can be demonstrated by comparing a currency's exchange rate value with its silver weight. Figures 2.6, 2.7 and 2.8 respectively show comparisons between penny weights and exchange rates against the florin for England, Scotland and Flanders. I have used 1351–70 as the index base period for England and Scotland, and the 1360s for Flanders.¹⁶⁴ These periods were selected to act as the base because they precede the chronic silver shortages of the bullion famine and thus offer the best period to use as a 'par' relationship between the weight of a penny and its value against the florin. All three graphs show that there was

¹⁶¹ Postan, 'Economic Foundations', p. 9. Postan notes that Bloch and Werwerke were the original sources of the different uses of gold and silver in the medieval economy, citing M. Bloch, 'Le problème de l'or au Moyen Age', *Les annales d'histoire économique et sociale*, Vol. 5, No. 19 (1933), pp. 1–34; and H. van Werweke, 'Monnaie, lingots ou marchandises? Les instruments d'échange aux XIe et XIIe siècles', *Les annales d'histoire économique et sociale*, Vol. 4, No. 17 (1932), pp. 452–68.

¹⁶² T. J. Sargent and B. D. Smith, 'Coinage, Debasements, and Gresham's Laws', *Economic Theory*, Vol. 10, No. 2 (1997), pp. 197–226, 198; A. Smith, *Wealth of Nations* (St Ives, 2012), pp. 44–50; W. S. Jevons, *Money and the Mechanism of Exchange* (London, 1876), p. 69.

¹⁶³ Allen, *Mints and Money*, p. 151; N. J. Mayhew, 'From Regional to Central Minting, 1158–1464', in C. E. Challis (ed.), *A New History of the Royal Mint* (Cambridge, 1992), p. 173.

¹⁶⁴ There is insufficient exchange-rate data for Flanders in the 1350s to be able to use the same base period as England and Scotland, hence the need for three separate graphs.

generally a close relationship between a currency's weight and its value on the international market. Currencies were slightly more likely to be overvalued in the fifteenth century, which was possibly the result of the bullion famine in Europe increasing the value of silver. Indeed, the widest divergence between the weight of the English silver currency and its corresponding exchange rate came at the start of the fifteenth century. This could well have been the result of overvaluation of the English currency on the Continent. Given that there is no exchange rate adjustment for the 1411 debasement, but there was for the 1464 debasement, it seems that scanty data might be exaggerating the divergence. Indeed, there are no mercantile exchange rates available between 1411 and 1422.

The heavy debasement in Flanders generally saw a corresponding fall in the *groot's* value against the florin, Figure 2.8. In Scotland the same was often true, though the Scottish currency was actually undervalued in the late fourteenth century. The imposition of a new Anglo-Scottish exchange rate of 3:4 in 1373, and then 1:2 in 1393, was a punitive measure taken by the English,¹⁶⁵ and was clearly an unfair exchange rate given that the reduction in intrinsic value was less severe than these ratios. Of all three currencies, the English was most consistently valued in line with its weight, which is unsurprising since adjustments to the currency's weight were infrequent and did not involve the use of additional base metal.

It is evident that the international market valued both gold and silver currencies by the intrinsic content of bullion, but this was not so straightforward for silver in domestic

¹⁶⁵ Gemmill and Mayhew, *Changing Values*, p. 117.

markets. The consequence of silver coins having a double-faceted value derived from both their intrinsic value and their tale value is that there has been considerable debate as to whether domestic markets took silver by ‘weight’ or by ‘tale’.

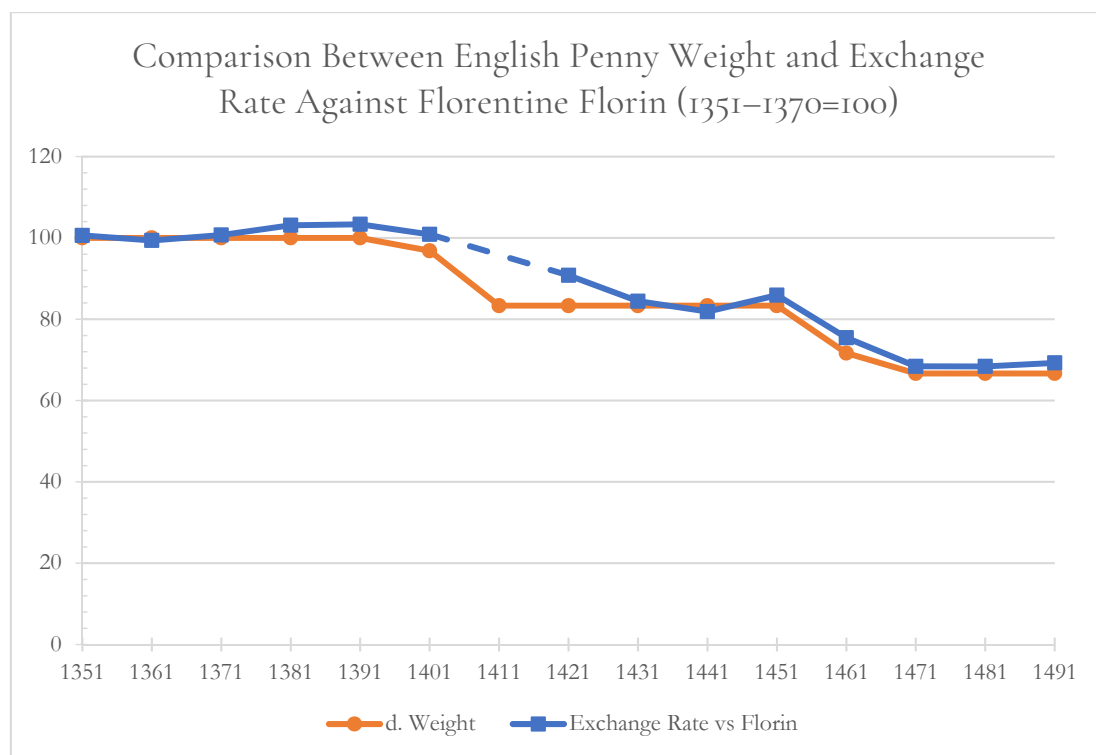


FIGURE 2.6
[As Figures 2.4 and 2.5]

The older of the two theories, circulation by weight, has enjoyed support from a number of eminent historians. The most notable of them is Miskimin. Throughout his numerous studies on the economies of late medieval England and France, he has framed the relationship between money and prices as one derived from the intrinsic value of the currency.¹⁶⁶ His main argument centred around the notion that late medieval governments were unable to enforce the same old tale value after a debasement, and thus there

¹⁶⁶ See especially H. A. Miskimin, ‘The Enforcement of Gresham’s Law’, in H. A. Miskimin (ed.), *Cash, Credit*

were a number of different values for each denomination: ‘the legal rate, set by the prince, and the rate set by the market [... and] the rate set by the mints for the purchase of gold and silver’.¹⁶⁷ As such, a debasement would trigger price inflation when sellers demanded more new coins so as to receive an equal amount of silver as they would have been given with old coins.¹⁶⁸

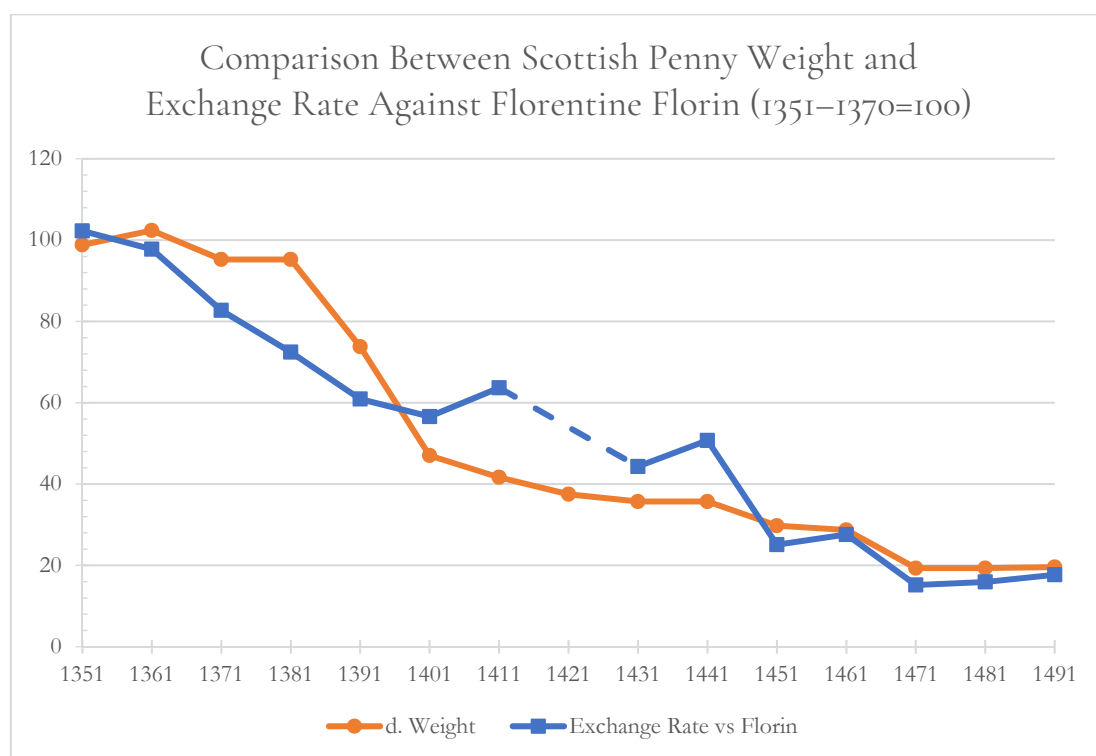


FIGURE 2.7
[As Figures 2.4 and 2.5]

These ideas were rearticulated by Rolnick, Velde and Weber, whose model demonstrated that, ‘at least some of the time’, coins were valued by weight.¹⁶⁹ They admitted,

and Crisis in Europe, 1300–1600 (London, 1989), pp. 147–61.

¹⁶⁷ *Ibid.*, pp. 148–9.

¹⁶⁸ Miskimin, *Money, Prices and Foreign Exchange*, pp. 53–71; Miskimin, ‘Gresham’s Law’, pp. 148–9.

¹⁶⁹ A. J. Rolnick, F. R. Velde and W. E. Weber, ‘The Debasement Puzzle: An Essay on Medieval Monetary History’, *The Journal of Economic History*, Vol. 56. No. 4 (1996), p. 789.

however, that the spikes in mint output following a debasement are most easily explained by accepting circulation by tale. Their rebuttal to this explanation was to argue that while accepting circulation by tale explains incentives to bring coin to the mint,¹⁷⁰ it ignores the disincentives. For instance, in the case of a debt agreement, a debtor might seek to cheapen their debt by having their heavy coins increased in number during a debasement. This would be to the loss of the creditor, who would be paid in less silver, and the debtor would have lost money through seigniorage and mintage costs. However, both parties could mitigate losses by simply negotiating to lower the debt by less than the value of the minting costs and by the amount of weight reduction, bypassing the mint altogether.¹⁷¹ Though there is merit in this argument, it has not become the main line in current historiography.

The most popular approach in modern historiography has been to accept that circulation was largely by tale with no adjustment for most cases of clipping or wear.¹⁷² Acceptance of circulation by tale must be primarily because there is, as Rolnick *et al.* admitted, no obvious way to explain the huge influx of coin to the mint during debasements. Indeed, it is the consensus that profit for mint-goers was the primary reason why debasements were possible—they offered mutual profit for the mints, the ruler and the individual bringing old coins to the mint.¹⁷³ Those bringing bullion to the mints would have

¹⁷⁰ Though Miskimin suggested that people still brought coins to the mint despite their circulation by weight because the government had to take them by tale. Therefore, debased coins could cheapen obligations to the government. Miskimin, *Money, Prices and Foreign Exchange*, p. 46.

¹⁷¹ Rolnick, Velde and Weber, 'Debasement Puzzle', pp. 801–3.

¹⁷² N. J. Mayhew, *Sterling: The Rise and Fall of a Currency* (London, 1999), p. 79; Munro, 'Coinage Debasements in Burgundian Flanders'.

¹⁷³ Spufford, *Money and Its Use*, pp. 289–307. Of course, if the mint-goer was planning to use the coins for

profited from receiving a greater number of coins in the short term, until the market adjusted and prices rose.¹⁷⁴ The legal evidence is also on the side of those who argue for circulation by tale; Fox noted that in the case of English debt litigation, it was very rare for conflict to arise over the valuation of money. This is perhaps unsurprising because debts were stipulated by tale value, rather than by a quantity of precious metal.¹⁷⁵

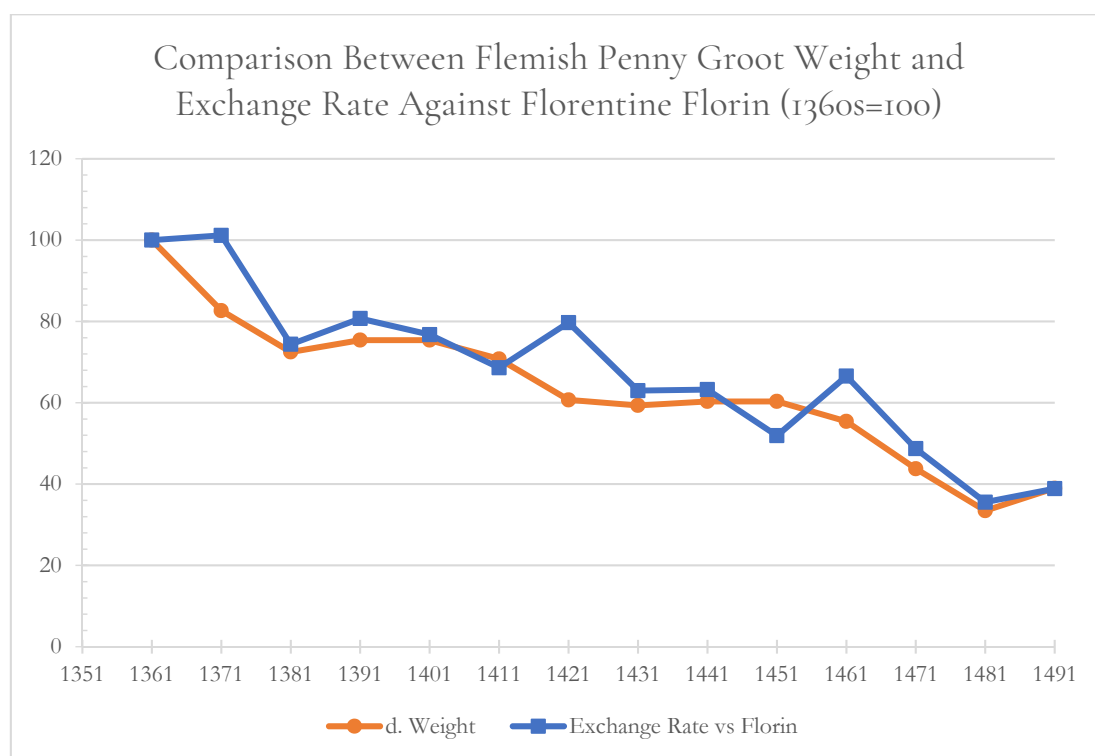


FIGURE 2.8
[As Figures 2.4 and 2.5]

There were, of course, exceptions to the rule of circulation by tale. These exceptions most commonly arose in extreme circumstances where there was a great deal of foreign

international trade, then the debasement would have been less profitable.

¹⁷⁴ Munro, 'Coinage Debasements in Burgundian Flanders', pp. 325, 327.

¹⁷⁵ D. Fox, 'The Enforcement of Nominal Values to Money', in D. Fox and W. Ernst (eds), *Money in the Western Legal Tradition: Middle Ages to Bretton Woods* (Oxford, 2016), pp. 204–5, 215–18. Desan, *Making Money*, p. 71.

coin, or where debasement was heavy. Both of these instances spread distrust in the coinage. In the case of crockards and pollards circulating in England during the reign of Edward I, Mayhew noted that they were particularly problematic because ‘the weight, and particularly the fineness, of the coins was difficult to establish, and those who knew them could generally make a profit at the expense of those who did not’. This suggests that in the case of doubtful or unknown intrinsic value, circulation by weight became more common. However, this distrust in the coins eventually led to many people refusing them, despite their 1/2d. legal valuation, and the only course of action was to orchestrate a complete demonetisation—meaning that they were entirely withdrawn from circulation.¹⁷⁶ Circulation by weight was clearly undesirable to the government, who relied on circulation by tale in order to enact debasements.

The determinant of circulation appears to be availability of information. Merchants, who had the means to weigh coins, were more likely to use coins at their intrinsic value on the international market. It is unreasonable to expect ordinary peasants to have carried scales for use at the marketplace.¹⁷⁷ Coins therefore should be expected to have passed at their tale value, unless the debasement was so severe that it damaged market trust in

¹⁷⁶ N. J. Mayhew and D. R. Walker, ‘Crockards and Pollards: Imitation and the Problem of Fineness in a Silver Coinage’, in N. J. Mayhew (ed.), *Edwardian Monetary Affairs (1279–1344): A Symposium Held in Oxford, August 1976*, *BAR*, Vol. 36 (Oxford, 1977), p. 137; Desan, *Making Money*, pp. 108–9; M. Mate, ‘Monetary Policies in England, 1272–1307’, *BNJ*, Vol. 41 (1972), pp. 60–1; M. Prestwich, ‘Edward I’s Monetary Policies and Their Consequences’, *EconHR*, Vol. 22, No. 3 (1969), pp. 408–9.

¹⁷⁷ For more on the importance of information and commodity money circulation, see F. R. Velde, W. E. Weber and R. Wright, ‘A Model of Commodity Money, With Applications to Gresham’s Law and the Debasement Puzzle’, *Review of Economic Dynamics*, Vol. 2, No. 1 (1999), pp. 301–6; N. Gandal and N. Sussman, ‘Asymmetric Information and Commodity Money: Tickling the Tolerance in Medieval France’, *Journal of Money, Credit and Banking*, Vol. 29, No. 4 (1997), pp. 440–57.

the coins.¹⁷⁸

It is consistent with the historiography to conclude that coins functioned differently in different markets. They were commonly taken by weight for international trade, but by tale domestically. Within the domestic market, a number of different denominations were available for everyday use. Having now established how we might expect the valuations of currencies to be received on the international and domestic markets, we must now turn to a more detailed examination of changes made to the currency denominations of England, Scotland and Flanders. It is necessary to outline the changes made to the main denominations of England, Scotland and the southern Low Countries because the subsequent chapter deals with commodities of different levels of value, and Chapter 4 examines rents and wages. By conducting a detailed survey of the various denominations in circulation, and the changes made to them throughout the late medieval period, we are better equipped to examine deviations in price trends between commodities of different price levels from a monetary perspective. Consequently, the next three sections set out the changes made to the currencies of England, Scotland and the southern Low Countries.

2.1.3 THE CURRENCY OF ENGLAND

There were a number of silver coins in circulation in England throughout the late medieval period. The silver penny had been created long before the Conquest and had a weight

¹⁷⁸ Jevons also noted that it was even more difficult to detect changes in the fineness of coins: Jevons, *Money and the Mechanism of Exchange*, p. 76. Thus, when base metals were mixed in with silver, it should have been possible to mask debasement to an extent and encourage continued circulation by tale.

of 22.2 grains in Edward I's reign.¹⁷⁹ The smallest coin was the farthing (worth 1/4d.) which was introduced in 1279 (weighing 6.9 grains), followed by the halfpenny, which was introduced in 1280 and weighed 11.1 grains.¹⁸⁰ The year 1279 had clearly been an active one for Edward I's monetary policies, as the groat (worth 4d.) was also introduced.¹⁸¹ In 1335, the historic decision to debase the farthings and halfpennies was made by parliament. They were reduced from sterling fineness (93.4375%) to 83.33% fine.¹⁸² Weight reductions of 3.6% and 5.357% were imposed on the halfpenny and farthing respectively.¹⁸³ This debasement of 11.21% attempted to revive the falling mint outputs and increase the availability of small silver coins. New groats and half groats were introduced in 1351, the former having the value of 4d. and a weight of 72 grains, the latter worth 2d. and weighing 36 grains. The penny was debased from 20 grains to 18 grains, and the halfpenny and farthing were reduced to 9 grains and 4.5 grains respectively.¹⁸⁴

No further adjustments were attempted until, in 1409, it was planned to reduce the weight of the groat to 64.3 grains, the half groat to 32.1 grains, the penny to 16.1 grains, the halfpenny to 7.9 grains and the farthing to 3.9 grains. However, there are no mint accounts between 29 September 1408 and 29 November 1411, so it is unclear whether this

¹⁷⁹ Allen, *Mints and Money*, p. 154.

¹⁸⁰ *Ibid.*, pp. 353, 154.

¹⁸¹ M. Allen, 'The Groats of Edward I', *BNJ*, Vol. 74, No. 5 (2004), p. 28. For a description of the groat and its differences with the pennies of Edward I, see T. Snelling, *A View of the Silver Coin and Coinage of England, from the Norman Conquest to the Present Time* (London, 1762), p. 12.

¹⁸² Allen, *Mints and Money*, pp. 160–3.

¹⁸³ *Ibid.*, pp. 83, 154.

¹⁸⁴ There had been a couple of gradual reductions in the silver penny, halfpenny and farthing between 1335 and 1351. The penny slid from 22.2 grains to 20 grains in 1346. In 1345 the halfpennies and farthings were reduced to 9.7 grains and 4.5 grains. *Ibid.*, p. 154.

debasement was carried out, and no coins struck to these specifications have been found. Importantly, the debasement of 1411–12 kept all the silver denominations in proportion: the groat was reduced to 60 grains, the half groat to 30 grains, the penny to 15 grains, the halfpenny to 7.5 grains and the farthing to 3.75 grains. There was a minor debasement of the halfpenny in 1445 in an attempt to resolve the problem of the constant lack of small change that had ailed parliament since the fourteenth century.¹⁸⁵ The halfpenny's weight was briefly brought out of step with this debasement, now weighing 6.8 grains against a penny of 15 grains.¹⁸⁶

The silver coinage was once again left untouched until Edward IV's debasement of 1464. This debasement brought all the silver coins in line again. The groat was reduced to 48 grains, the half groat to 24 grains, the penny to 12 grains, the halfpenny to 6 grains, and the farthing to 3 grains. Aside from an unknown temporary reduction of the half groat's weight in 1491/2 to finance Henry's VII's war with France, there were no further debasements in the fifteenth century. Henry VIII's 1526 debasement again largely maintained proportionality between silver denominations, when the groat was reduced to 42.7 grains, the half groat to 21.3 grains, the penny to 10.7 grains, the halfpenny to 5.3 grains and the farthing to 2.7 grains.¹⁸⁷

Silver denominations were of low value and therefore more suited to the needs of the lower end of the domestic economy, rather than for commercial settings because they

¹⁸⁵ In 1445, parliament heard that there were once again not enough small coins to ensure that people received change for their purchases. *PROME*, te, v, 108.

¹⁸⁶ Allen, *Mints and Money*, p. 154.

¹⁸⁷ *Ibid.*, pp. 152–4.

were less appropriate for making large payments. Gold offered a more convenient means of moving large volumes of money. There had been a brief trial with gold pennies in 1257,¹⁸⁸ when gold coins with the weight of two pennies but the value of twenty pennies were struck.¹⁸⁹ However, the gold was undervalued, and:

They [Henry III's council] said that through that coinage gold would be held of much lower value, when that money should come to be dispersed in so many hands; a thing that was already evident, seeing that sheet gold, which always used to be worth ten marks, was then worth nine marks only, or even eight.¹⁹⁰

There was the added issue that, in the thirteenth century, gold was simply too highly valued to fit the needs of the economy. The *Chronicles of the Mayors and Sheriffs* commented on 'the poor of his realm, the chattels of very many of whom are not worth in value a single gold coin'.¹⁹¹ After it was demonetised in 1265, the English shelved the idea of a gold coin until Edward III brought it back in 1344. There were similar quick failures of gold coins in 1344: the florin of 1344 was demonetised within a year, as was the quarter florin.

Edward III's noble of 1344 followed the same fineness standard that had been established in the early 1340s: 23 carats, 3.25 grains fine. The initial noble of 1344 was too heavy, and a reissue in 1346 reduced the weight from 136.75 grains to 128.5 grains. In 1351, the weight was reduced again, this time falling to 120 grains. The noble also existed in a half and a quarter denomination, though few quarter nobles survive. As had been the case for the silver coinage in 1408/9, there had been an intended reduction of the noble to 112.5

¹⁸⁸ D. A. Carpenter, *The Reign of Henry III* (London, 1996), p. 126.

¹⁸⁹ D. A. Carpenter, 'The Gold Treasure of King Henry III', in P. R. Coss and S. D. Lloyd (eds), *Thirteenth Century England* (Woodbridge, 1986), p. 78.

¹⁹⁰ *Chronicles of the Mayors and Sheriffs of London, A. D. 1188 to A. D. 1274*, ed. H. T. Riley (London, 1863), pp. 31–2.

¹⁹¹ *Ibid.*, p. 32.

grains to compensate for clipping, but again we cannot be sure if this debasement was carried out. In the 1411/12 debasement the noble was reduced to 108 grains. Clipping continued, and quality control was issued in 1421, when the weights of gold nobles were to be checked.¹⁹²

The 1464 debasement left the noble's weight unscathed, but the first—and only—tale adjustment of an English coin was made: its face value was raised from 6s. 8d. to 8s. 4d. This effectively raised the value of gold, but appears to have proved unpopular. In 1465, the solution was, therefore, to issue brand new gold coins: the ryal and the angel. The ryal weighed 120 grains, and had a value of 10s., while the angel weighed 80 grains and was worth 6s. 8d., making the latter a clear attempt to replace the gold noble. There were no further changes made to the gold coinage until the reign of Henry VIII. In 1526, Henry VIII introduced the George noble of 6s. 8d., weighing 71.1 grains, and the crown of the double rose, worth 5s. and weighing 57.3 grains. Both had half denominations.¹⁹³

It has become apparent in this section that the English operated a strong policy of monetary stability, with debasements only initiated about every fifty years. These debasements appear to have been fairly cautious and made no dramatic change to the weight of the currency beyond that which had been eroded from decades of circulation. England's currency, even the small denominations, was always struck from bullion—'black money' did not feature in the English monetary policy.

¹⁹² Allen, *Mints and Money*, pp. 150–1, 153, 163

¹⁹³ *Ibid.*, pp. 152–3.

2.1.4 THE CURRENCY OF SCOTLAND

The policy towards currency was more complex in Scotland, for debasement was aggressive and frequent. These debasements did not always keep denominations in proportion to each other, and in the face of the bullion shortages of the late fourteenth and fifteenth centuries, Scotland made various adjustments to denomination weights in an attempt to attract metal to the mints.

The English and Scottish currencies generally enjoyed physical parity until 1367 and legal parity until 1373. It is unsurprising, therefore, that Scotland's structure of the denominations up to the second half of the fourteenth century is much the same as England's. The English introduction of the farthing in 1279 and the halfpenny in 1280 sparked the Scottish introduction of these same two denominations in 1280.¹⁹⁴ Likewise, the Scots generally kept the penny's weight in line with England's penny. The Scottish penny weighed 22.2 grains until it was reduced to 16 grains in 1351, a temporary break with physical parity with England that was restored in 1357, when the Scottish penny was struck at 18 grains. It came with a 4d. groat of 72 grains.¹⁹⁵ The break in parity with England's currency occurred in 1367, when the Scots debased their currency by 16%. A 4d. groat of 61 grains was struck, implying a penny weight of 15.25 grains—all legislation for subsequent debasements of Scottish silver give only the weight of the groat.¹⁹⁶ There was a further debasement in 1393, when the 4d. groat was reduced by 25.5%, to 46 grains.¹⁹⁷

¹⁹⁴ J. D. Bateson, *Coinage in Scotland* (London, 1997), pp. 47–9.

¹⁹⁵ It had a fineness of 0.925 (92.5%). See Bateson, *Coinage in Scotland*, p. 54.

¹⁹⁶ Gemmill and Mayhew, *Changing Values*, p. 138.

¹⁹⁷ Thus implying a penny weight of 11.5 grains. See Gemmill and Mayhew, *Changing Values*, pp. 117, 138.

The fifteenth century brought a period of frequent debasement in Scotland. At the opening of the century, the 4d. groat was reduced to 28 grains, giving a theoretical penny weight of 7 grains. In the 1420s, the 4d. groat's weight was increased to 36 grains.¹⁹⁸ This weight persisted in the 1430s, but the tale value of the groat was increased from 5d. to 6d. between 1433 and 1434, though it is not known when the value of 4d. was abandoned.¹⁹⁹

No changes were made to the silver coinage until 1451, when the fleur-de-lis groats were cried down to 4d. and a new 8d. 'crown' groat of 60 grains was struck. However, it appears that the crown groat of 60 grains went for 12d. rather than 8d.²⁰⁰ The weight of the 12d. crown groat slid slightly in the 1460s, though it was intended to be fairly close in weight to the English groat, so could not have been far below 60 grains. In 1467 the crown groat was cried up to 14d. and a new light groat worth 12d. and weighing 40 grains was issued.²⁰¹ 'Thistle-head' groats, which were only 77% fine and worth 8d. were issued shortly after.²⁰² The issue of this more base groat ushered in a new period of experimentation with fineness; though alloy had been added to the petty coinage since the reign of Robert III,²⁰³ this was the first attempt to make larger silver denominations baser.

James III introduced placks, which were billon coins worth 7d., but were cried down to 6d. in 1471. Mints only accepted them at a value of 2d., presumably due to their low

¹⁹⁸ These particular 4d. groats are known as 'fleur-de-lis' groats. See Stewart, *Scottish Coinage*, pp. 138–9; Gemmill and Mayhew, *Changing Values*, p. 119.

¹⁹⁹ Gemmill and Mayhew, *Changing Values*, pp. 119, 138. A 6d. groat of 36 grains thus implies a penny of 6 grains.

²⁰⁰ *Ibid.*, p. 120. This gives a theoretical penny weight of 5 grains.

²⁰¹ *Ibid.*, p. 121. Using the value of the light groat, this gives a theoretical penny weight of 3.33 grains.

²⁰² *Ibid.*, p. 122.

²⁰³ Stewart, *Scottish Coinage*, p. 35; Gemmill and Mayhew, *Changing Values*, p. 123.

intrinsic value! James III also issued a large amount of 'black' money of low intrinsic value to combat an apparent lack of small change. The apparent success of the copper farthings in the 1460s appears to have encouraged James III to issue more copper money. The 1460s issue seems to have effectively solved the small change problem, but the 1480s issues created new problems. Cochrane placks, which are thought to be the so-called 'cruix pellit' pennies worth 3d. but made of copper, flooded the market in 1482. As many as 4,000,000 (£50,000) of these pennies were produced. Compared to the issue of copper farthings in 1466, which was intended to be worth £3,000 and would have equated to 2,880,000 farthings,²⁰⁴ it is unsurprising that the response to the Cochrane placks was aggressive. Robert Cochrane, a favourite of James III and the individual seen as the initiator of the black money, reached the nadir of his career when he was hanged from Lauder Bridge by an angry mob during the 1482 crisis.²⁰⁵ The *Short Chronicle* of 1482 suggests that black money has been linked to the Lauder bridge crisis.²⁰⁶ Though placks were clearly unpopular, and

²⁰⁴ J. E. L. Murray, 'The Black Money of James III', in D. Metcalf (ed.), *Coinage in Medieval Scotland (1100–1600): The Second Oxford Symposium on Coinage and Monetary History*, BAR, Vol 45 (Oxford, 1977), pp. 121, 125. Though there were calls for the farthings to be returned to white money (i.e. of good silver) the following year, these copper farthings were still being struck in June 1468 and, for all the records show, continued to be present in circulation in the 1470s. Indeed, in 1468, parliament increased the number of black farthings that could be used in a single transaction—from 1s. in the pound to 3s. This restriction on the quantity useable in each transaction also helped to prevent the market from becoming flooded with copper farthings. Gemmill and Mayhew, *Changing Values*, p. 125. England also restricted the number of debased halfpennies that could be used in a single transaction following the 1445 debasement. Individuals could no longer use more than 12d.'s worth of halfpennies for every 240d. spent. *PROME*, te, v, 109.

²⁰⁵ Murray, 'Black Money of James III', pp. 115, 121. Macdougall has argued that there was no such Robert Cochrane, and that there are only two mentions in the sources of a Thomas Cochrane. He suggests that Robert Cochrane might have been invented by chroniclers. N. Macdougall, *James III: A Political Study* (Edinburgh, 1982), pp. 158–65.

²⁰⁶ Macdougall, *James III*, pp. 311–12; Gemmill and Mayhew, *Changing Values*, pp. 125–6; Cochran-Patrick, *Coinage of Scotland*, p. cxxvii.

continued to be so during the reigns of James IV and James V, they remained in use.²⁰⁷

The fine silver groats were struck at 48 grains between 1484 and 1496, and were valued at 14d. Around 1496 the groats were reduced to 40 grains, and were to pass for 12d.²⁰⁸ The fine silver coinage was left untouched for the opening decades of the sixteenth century, but in 1526 the Scottish groat was struck at 44 grains, and worth 18d.²⁰⁹

Like England, Scotland also functioned with a bimetallic currency from the mid fourteenth century onwards; David II introduced a gold noble during his great restructuring of the coinage in 1357. The noble became one of the main gold coins of Scotland, and was struck throughout the late medieval period. Like the English noble, its value was 6s. 8d., and was 96% fine gold (23 carats).²¹⁰ No nobles issued under Robert II, but around 1393 they were reintroduced by Robert III to copy the French *écu à la couronne*. The king lightened the noble to 62 grains, and reduced its tale value to 5s.²¹¹ Robert III's light lion was issued in the early fifteenth century and had the same 5s. value, but its weight was further reduced to about 38 grains. James I's demy of c.1424 was heavier, weighing 54 grains, but came with a higher tale value of 9s. This weight and tale value were preserved by James II, but he reduced the fineness of his demy to 22 carats in the 1430s. The lion of James II (c.1451) was less fine still at 21 carats, still weighed 54 grains, yet had a higher tale value of

²⁰⁷ Gemmill and Mayhew, *Changing Values*, pp. 128–37.

²⁰⁸ *Ibid.*, p. 128. This gives a theoretical penny weight of 3.33 grains of silver.

²⁰⁹ It was based on the new English groat of 42.7 grains but had a slightly lower fineness. Gemmill and Mayhew, *Changing Values*, p. 134; Allen, *Mints and Money*, p. 154. This new 18d. groat gives a theoretical Scottish penny of 2.4 grains.

²¹⁰ Bateson, *Coinage in Scotland*, p. 74.

²¹¹ *Ibid.*, p. 75; Gemmill and Mayhew, *Changing Values*, p. 139.

10s.²¹²

The reign of James III also brought changes for the gold denominations. A rider of 23s., 79 grains and 22 carats fine was introduced in 1475. They were not struck after 1484 and were replaced by unicorns. These were worth 18s., weighed 59 grains and were also 22 carats fine. Notably, though James III was eager to introduce alloyed and billon coinage; he increased the fineness of his gold coins compared with those of his predecessor. James IV left the unicorns untouched in weight and tale value, but reduced the fineness to 20 carats in 1488. In 1496, he introduced gold crowns, which were worth 13s. 4d., weighed 52 grains and had a fineness of just 19.5 carats—the lowest of any medieval Scottish denomination. James V issued new unicorns in 1508, weighing 59 grains, worth 20s. and with a fineness of 20.5 carats. However, these same unicorns were passing for 20s. after 1513. In 1525 James issued a new gold coin of 20s., the abbey crown. Its weight of 52 grains was one of the lowest in the whole period, but its improved fineness of 21.5 carats helped to justify its relatively high tale value.²¹³

Scotland's policy towards its currency was clearly quite different from England's. Heavy debasement and frequent use of alloy and billon coinage for small denominations in the fifteenth century set her apart from her neighbour. Interestingly, despite the heavy debasement, Scotland tended to preserve the value of her gold coinage as much as possible, with fineness never falling below 19.5 carats. This was presumably because the reliance of the Scottish crown on foreign trade for income made it reluctant to jeopardise

²¹² Bateson, *Coinage in Scotland*, pp. 74–6; Gemmill and Mayhew, *Changing Values*, p. 139.

²¹³ Bateson, *Coinage in Scotland*, pp. 78–80; Gemmill and Mayhew, *Changing Values*, p. 139.

the denominations which were most crucial to the mercantile community.

2.1.5 THE CURRENCY OF THE SOUTHERN LOW COUNTRIES

‘The moneys of account in the principalities of the Low Countries were particularly complex’, Spufford observes.²¹⁴ His words might be taken to be a warning to anyone studying the challenging money system of the Low Countries, because teasing apart the tangle of coins is a testing ordeal. A geographically complicated region, it initially lacked a coherent, unified currency: ‘A “stuiver”, “vlieger”, “patard”, “double gros”, “dopplegrote”, and “sou” are all names used at various times and places for the same coin’.²¹⁵ Mercifully, uniformity in descriptive value eventually emerged in the form of the Flemish groot, which ultimately became the standardised currency in the Burgundian Netherlands in 1433. Upon his success in compelling Jacoba of Bavaria to abdicate in 1433, Philip the Good found himself Count of Holland, Zeeland and Hainaut. This was added to his other recent acquisitions of Brabant, Limburg, Antwerp, Namur and Luxemburg.²¹⁶ Many of these regions operated with a different coinage, which would have made initiating a centralised rule difficult as it would have prevented the creation of ‘national’ mints. Duke Philip had decided enough was enough, and the Estates General had instigated the change, ratified by each provincial estate’s assembly throughout the land.²¹⁷

However, the journey to the full money unification of 1433 had been one fraught with

²¹⁴ P. Spufford and W. Wilkinson, *Interim Listing of the Exchange Rates of Medieval Europe* (Keele, 1977), p. 262.

²¹⁵ R. A. Levinson, *The Early Dated Coins of Europe, 1234–1500* (Clifton, N.J., 2007), p. 19.

²¹⁶ G. Edmundson, *History of Holland* (Cambridge, 1922), p. 2.

²¹⁷ Nicholas, *Medieval Flanders*, pp. 376–7.

complexities for the Flemish and Brabantine currencies. In addition to other coins, Flanders and Brabant had shared the *leeuwengroot* between 1299 and 1365. These proved successful, with 60 million having been struck by 1365.²¹⁸ But after Philip the Bold's disruption of the monetary union,²¹⁹ each functioned independently until 16 July 1384, with their own money of account and link money.²²⁰ Both the Flemish and Brabantine *groots* saw heavy debasement throughout the 1360s and 1370s. Though Louis de Male's debasements were often subtle enough that they would only be detected by money changers, the damage caused from such frequent debasements encouraged the striking of a new coin, the double *groot*, between 1365 and 1384.²²¹ The absorption of Flanders into the Burgundian-Valois dynasty following the death of Louis de Male in 1384 brought with it monetary reform and a reinforcement of the currency. After 1384, the link money of Flanders and Brabant was the Flemish *groot*, though the monies of account remained localised.²²² This reform also saw a 25% reduction in the weight of the double *groot*, now with a fineness of just 50%.²²³ Another monetary reform was attempted in 1389–91, when Brabant was under shared rule with the Burgundians, after Joanna duchess of Brabant offered rule to Margaret de Male and Philip the Bold. Separate link money was again introduced, and the Flemish *groot* was reinforced. Thus, until 1399, the link money became pegged at a ratio

²¹⁸ B. J. P. van Bavel, *Manors and Markets: Economy and Society in the Low Countries, 500–1600* (Oxford, 2010), p. 197.

²¹⁹ *Ibid.*

²²⁰ Link money is the actual currency that circulated and was thus tied to the money of account. See van der Wee, *Growth of the Antwerp Market*, i, pp. 107–9. It functioned as in England, with a set number of groats (a real currency) to a mark (a money of account).

²²¹ J. M. Murray, *Bruges, Cradle of Capitalism, 1280–1390* (Cambridge, 2005), p. 126.

²²² Van der Wee, *Growth of the Antwerp Market*, i, pp. 123–9.

²²³ Murray, *Bruges*, p. 126; Munro, *Wool, Cloth, and Gold*, p. 211.

of one Flemish *groot* to three old light Brabantine *groots*, while the money of account fluctuated between 1:3 and 1:2.4.²²⁴ In 1409, John the Fearless proposed an increase of 7% in the silver content of the *groot*, combined with a 25% increase in its tale value. However, this change never came to fruition as the war with France reignited.²²⁵ The fineness of the silver double *groot* did decline throughout the 1420s, and reached its nadir of 31.25% in 1431.²²⁶ The constant changes between shared currencies and independent currencies meant that bullion flowed between Flanders and Brabant during times of debasement. Indeed, the debasements in the closing decades of the fourteenth century had caused bullion to leave Brabant, much to the detriment of their money supply.²²⁷ The monies of account and link monies continued to fluctuate against each other until the monetary reform and reinforcement of 1433–5, when Philip the Good fixed the ratio of Flemish to Brabantine *groots* at 1:1.5.²²⁸

After the currency unification of 1433, Philip the Good was forced to leave the coinage untouched for the next three decades.²²⁹ Thus, the fineness of the *groot* and double *groot* were stabilised, remaining at 50%. The double *patard* was introduced in 1466, and was worth 4 *groots*. Its fineness of 95.83% allowed for it to circulate in England equivalent to

²²⁴ Van der Wee, *Growth of the Antwerp Market*, i, pp. 123–9; Munro, ‘English and Flemish Gold and Silver Values Data’ (29 June 2018).

²²⁵ Spufford, *Money and Its Use*, p. 311.

²²⁶ Munro, *Wool, Cloth, and Gold*, p. 211.

²²⁷ H. Laurent, *La loi de Gresham au Moyen Age; essai sur la circulation monétaire entre la Flandre et le Brabant à la fin du XIVe siècle* (Brussels, 1933), pp. 68–70.

²²⁸ Van der Wee, *Growth of the Antwerp Market*, i, pp. 123–9; Prevenier and Blockmans, *Burgundian Netherlands*, pp. 374–95; van Bavel, *Manors and Markets*, pp. 197–9; Munro, ‘English and Flemish Gold and Silver Values Data’ (29 June 2018). The 1433 reinforcement also came with a reduction in seigniorage charges to offset the unfavourable mint prices caused by the reinforcement. See Munro, *Wool, Cloth, and Gold*, p. 102.

²²⁹ Van der Wee, *Growth of the Antwerp Market*, ii, p. 84.

the English groat of 4d.²³⁰ They circulated significantly in England for around 45 years, forming as much as a fifth of the silver coin circulating in England.²³¹ The double *patard*'s fineness held stronger than the *groot*'s or the double *groot*'s, and was cried up to 4.5 *groots* in 1477, and up to 5 *groots* in 1482. At this point, the double *patard* still enjoyed a fineness of 83.33%, while the double *groot* had slid to 41.67% and the *groot* to 26.04%.²³²

The southern Low Countries also functioned with petty coinage. About a century before Scotland, Flanders was coining 'black money' with a low intrinsic value and an amount of alloy.²³³ Mites, which were worth $1/24$ of a penny *groot*,²³⁴ and double mites ($1/12$ of a *groot*), appear to have been popular small change in Flanders, to the point where legislation was put in place to prevent the best mites from being removed from circulation and sold. A hoard of 7,050 mites confiscated from a Hanseatic tavern-keeper in 1383 also suggests that the mites were not struck in a weight proportional to their value. The officials dealing with the coins found them to be light (well below $1/24$ of the weight of a *groot*) and thus sold them by the pound.²³⁵ Aside from the mite, petty coinage existed in the form of the quarter *groot*, which was struck in 1410 and worth 0.25 *groots*, or six

²³⁰ J. H. Munro, 'Warfare, Liquidity Crises, and Coinage Debasements in Burgundian Flanders, 1384–1482: Monetary or Fiscal Remedies?', *IDEAS Working Paper Series from RePEc* (2009), pp. 75–87; P. Spufford, 'Burgundian Double Patards in Late Medieval England', *BNJ*, Vol. 33 (1964), p. 115.

²³¹ The coins were confirmed as legal currency in the proclamations of 1504 and 1505, with the latter stating that those that were excessively worn were to be reminted. They were still legal in 1526 when the recoinage began, but the recoinage probably eradicated the majority of those that remained. See P. Spufford, 'Calais and Its Mint: Part 1', in N. J. Mayhew (ed.), *Coinage in the Low Countries (880–1500)*, *BAR* (Oxford 1979), p. 180; Spufford, 'Double Patards', p. 115.

²³² Munro, 'Warfare, Liquidity Crises', pp. 75–87.

²³³ The Brabantine mite appears to have been $2/3$ of the Flemish mite after the monetary unification, which is in line with the rest of its currency. See Spufford, *Monetary Problems and Policies*, p. 43.

²³⁴ Munro, 'Deflation and the Petty Coinage', p. 392.

²³⁵ Murray, *Bruges*, p. 129.

mites.²³⁶ These petty coins were known as *monnaies noires* because they contained little silver. The quarter *groot* was only 33.33% fine in 1410 and fell to 16.7% fine by 1477.²³⁷

Like England and Scotland, the southern Low Countries operated with a bimetallic currency. Their success with a gold coin came slightly sooner than England's; the gold *florijn* was first struck by Louis de Male in 1335, followed by the *lion d'or*, which was worth 60 *groots*.²³⁸ A number of different gold coins circulated throughout the late fourteenth, fifteenth and early sixteenth centuries. However, the most significant gold coin was the noble. The nobles of 1388 were a slightly lighter copy of the contemporary English nobles (7.647g against 7.741g pure gold) but were intended to pass for the full face value. The Flemish noble was initially valued at 102 *groots* but the reinforcement of 1390 (which reinforced gold coins more than silver) made the value of gold fall, so the Flemish noble was then worth only 72 *groots*.²³⁹ The trade importance of nobles, like double *patards*, meant the Burgundian duke did not excessively lighten the noble. Between 1390 and 1433, the noble never contained less than 6.799g of fine gold, which had been a brief fall in 1428. The noble also was never worth less than 60 *groots* in this same period, but generally commanded a higher tale value.

²³⁶ Munro, 'Deflation and the Petty Coinage', p. 392.

²³⁷ *Ibid.*

²³⁸ Murray, *Bruges*, p. 127.

²³⁹ J. H. Munro, 'Gold, Guilds, and Government: The Impact of Monetary and Labour Policies on the Flemish Cloth Industry, 1390–1435', in *Jaarboek voor Middeleeuwse Geschiedenis*, Vol. 5 (2002), p. 171. Fineness altered from Munro to reflect newer data from Allen: see Tables 3 and 4 in *Mints and Money*. If gold is reinforced more than silver, it means less silver can be bought with each gram of gold, thus causing the value of gold to fall and the value of silver to rise. For more on the Flemish nobles of Philip the Bold, see Allen, *Mints and Money*, pp. 270–1.

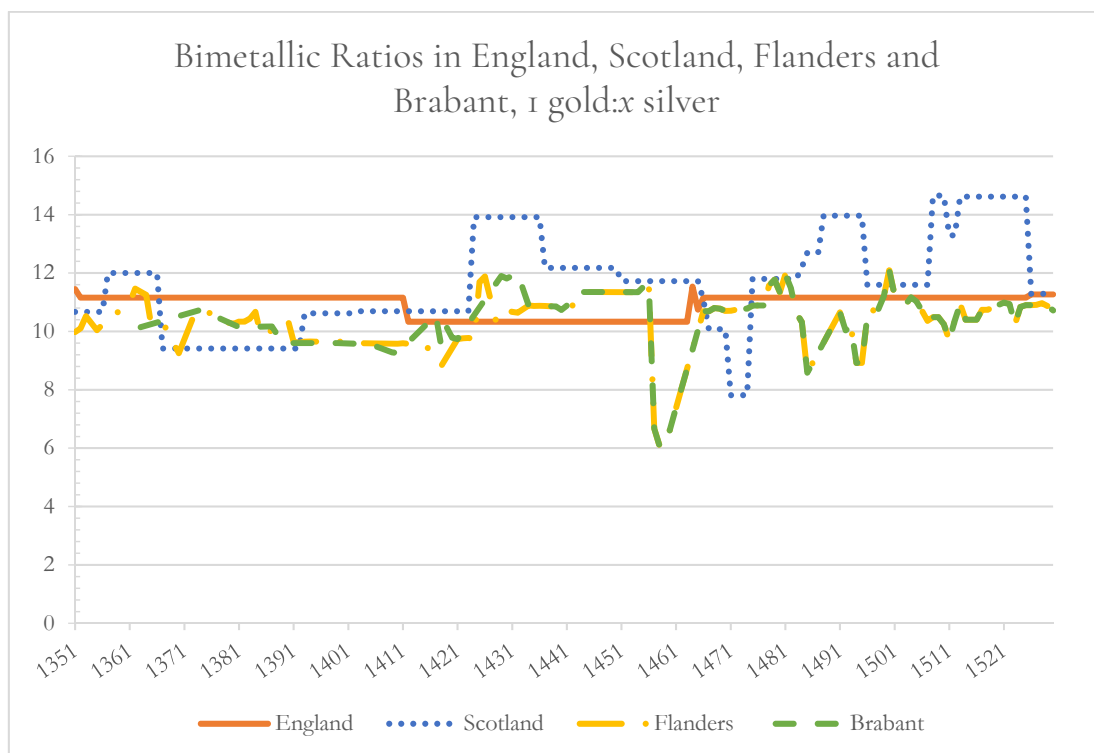


FIGURE 2.9

[Allen, *Mints and Money*, pp. 154–5; Gemmill and Mayhew, *Changing Values*, pp. 138–9; Stewart, *Scottish Coinage*, pp. 136–46; Munro, *Wool, Cloth, and Gold*, pp. 209–11; Erasmus, *Correspondence*, pp. 336–8; Munro, ‘Flemish and Brabantine Mint Output Data’ (29 June 2018).]

The monetary unification of 1433 also brought a new gold coin—the *philippus*,²⁴⁰ which went for 48 *groots*, was 23.8125 carats fine and weighed 3.626 grams. The *philippus*, like the noble, was frequently cried up. In 1493 the *philippus* was worth 62 *groots* but Philip the Fair’s proclamation of 1496–9 cried it up to 78 *groots*.²⁴¹ In addition to the *philippus*, a gold lion was struck in 1454, with a value of 60 *groots*, a fineness of 23 carats and a weight of 4.285 grams. This was followed by the introduction of the florin in 1466. The florin’s

²⁴⁰ Also known as the ‘rider’.

²⁴¹ For weights, see D. Erasmus, *The Correspondence of Erasmus: Letters 1 to 141, 1484–1500*, ed. R. A. B. Mynors, D. F. S. Thomson and W. K. Ferguson (Toronto, 1974), p. 337.

weight and fineness remained stable at 3.4 grams and 19 carats, but its tale value was increased from 3s. 5d. to 3s. 6d. in 1467. It was increased to 4s. in 1474.²⁴²

The analyses of the adjustments made to various denominations have shown that England was unique in the strength and hardness of its gold and silver currencies. Her currency was unusually stable compared to those of Scotland and the southern Low Countries. In England, debasements were only intended to rationalise the currency; old worn coins were in circulation, so debasements offered no means for profit.²⁴³ Aside from the double *patard's* likeness to the English groat, and the initial imitation noble, the Burgundian Low Countries operated a policy of heavy debasement, frequent tale value adjustment and a willingness to reduce fineness. A struggling balance of payments in both Scotland and the Low Countries meant that bullion most likely constantly drained from their countries, unless debasement incentivised merchants to bring metal to the mint. Thus, both Scotland and the Low Countries used 'black' money of little or no intrinsic value to ensure that the domestic markets were able to function. Both Scotland and the Low Countries did, however, tend to preserve the weight and fineness of the gold denominations more readily than they did the silver. The consequence of this was that the bimetallic ratios tended to fluctuate much more than they did in England, Figure 2.9. In England, the bimetallic ratio hovered around 1:11, whereas it reached as low as 1:6 in the 1450s in Flanders and Brabant, and exceeded 1:14 in Scotland at points in the fifteenth and sixteenth centuries. Thus, for much of the fifteenth century, Scotland and the Low Countries

²⁴² Munro, *Wool, Cloth, and Gold*, p. 210.

²⁴³ Allen, *Mints and Money*, p. 153.

seem to have operated with a pro-gold attitude to bimetallism. These fluctuations in the relative values of gold and silver influenced mercantile decisions to bring bullion to the mints, and thus had an impact on the quantity of money in circulation.²⁴⁴

2.2 THE QUANTITY OF MONEY IN CIRCULATION

The most obvious way of gauging how the availability of money fluctuated throughout the late medieval period is to look at existing estimates for the money stock. A number of estimates of the English money stock have been made in recent years. Allen provided estimates at fixed points in the late medieval period, while Mayhew has offered a series of annual estimates.²⁴⁵ Most recently, Palma has provided an updated set of estimates for both the English money supply and the money stock.²⁴⁶ Figure 2.10 shows that Palma's figures tend to sit within the upper and lower estimates provided by Allen, except at the 1422 benchmark where Palma's estimate of £1.62m well exceeds Allen's £1.35m. Mayhew's estimates come in at the lower end of consensus for the fourteenth and early fifteenth centuries. After 1490, his estimates are generally higher than Palma's. The higher estimates from 1490 to 1510 certainly have support in the historical narrative—around the time Henry VII was rumoured to have begun amassing his fortune, which was said to be over £1,000,000.²⁴⁷

²⁴⁴ Allen, *Mints and Money*, pp. 270–7.

²⁴⁵ Allen, *Mints and Money*, pp. 330, 344; N. J. Mayhew, 'The Quantity Theory of Money in Historical Perspective', in M. Casson and N. Hashimzade (eds), *Large Databases in Economic History: Research Methods and Case Studies* (London, 2013), pp. 62–96.

²⁴⁶ The latter being distinct from the former on account of it taking into account forms of fiat money, whereas 'money supply' implies coinage alone. N. Palma, 'Reconstruction of Money Supply Over the Long Run: The Case of England, 1270–1870', *EconHR*, Vol. 71, No. 2 (2018), pp. 373–92.

²⁴⁷ The *Venetian Calendar of State Papers* suggests this: in September 1497, Raimondo de Soncino, a visiting Milanese ambassador in London, told the duke of Milan that Henry had 'six millions of gold [ducats]'. This

Though there are clear differences between the various estimates of the English money stock, the overall trend is still evident. The size of the money stock was increasing in the late fourteenth century, but it declined some time between the 1370s and 1420s. This certainly corresponds with the historiography on the bullion famine (c.1395–1415) which, as Chapter 1 made plain, suggests that Europe struggled with bullion availability in this period.²⁴⁸ The money stock declined throughout the early and central part of the fifteenth century, with recovery coming only after the 1470s. Even though the trade conflicts and disruptions of the early fifteenth century no doubt encouraged the initial decline in the money stock,²⁴⁹ the continued decline in the middle of the fifteenth century fits with the

would equate to around £1,300,000 in 1497, according to F. C. Dietz, *English Government Finance, 1485–1558* (London, 1964), p. 87. For the original reference to Raimondo de Sonico's observation, see 'Venice: 1497', in *Calendar of State Papers Relating to English Affairs in the Archives of Venice, Volume 1, 1202–1509*, ed. Rawdon Brown (London: Her Majesty's Stationery Office, 1864), *British History Online*, <<http://www.british-history.ac.uk/cal-state-papers/venice/vol1/pp252-266>> (27 March 2018). For more arguments in favour of a £1,000,000 surplus, see A. Weir, *Henry VIII: King and Court* (London, 2002), p. 13; and D. Grummitt, 'Henry VII, Chamber Finance and the "New Monarchy": Some New Evidence', *Historical Research*, Vol. 72, No. 179 (1999), pp. 229–43. For my own estimates of the money stock during the reign of Henry VII, see K. Ball, 'Royal Wealth and the English Money Stock During the Reign of Henry VII' (unpublished MSt thesis, University of Oxford, 2014).

²⁴⁸ There was also the added difficulty of trade conflicts in the late fourteenth century, notably in the 1370s. Following the removal of the wool staple from Middleburg to Calais, Anglo-Flemish conflict flared up, affecting trade. Renewed war with France in 1369 had already harmed trade with Gascony and Spain, and in August 1371, Anglo-Flemish disputes led to mass confiscations of goods by both parties, and a general stoppage of trade for a number of years. The outbreak of civil war in 1379 also presumably damaged trade, as many foreign merchants were forced to leave Flanders. See T. H. Lloyd, *England and the German Hanse, 1157–1611: A Study of Their Trade and Commercial Diplomacy* (Cambridge, 1991), p. 104; D. Nicholas, 'The English Trade at Bruges in the Last Years of Edward III', *Journal of Medieval History*, Vol. 5, No. 1 (1979), pp. 23–47. Incidentally, it was thus in the 1370s that the Scots were able to enjoy a boom in their wool trade. Grant, *Independence and Nationhood*, p. 70.

²⁴⁹ Primarily, these disruptions came in the form of piracy at sea in the first decades of the fourteenth century, where Scotland was a key perpetrator; the negative impact on the wool and cloth trade caused by the Partition and Bullion Ordinance of 1429, which required the full cost of the sale to be made in cash or gold immediately after doing business (effectively destroying the use of mercantile credit); and the Anglo-Flemish war that ensued, beginning in 1366 and lasting until 1440. K. Stevenson, *Power and Propaganda: Scotland, 1306–1488* (Edinburgh, 2014), p. 164; Allen, *Mints and Money*, p. 272; Munro, 'Mint Outputs, Money,

other main economic crisis period—the mid fifteenth-century ‘slump’. The recovery of the money stock in the last quarter of the fifteenth century is also reflective of the increased availability of silver after the reopening of the Central European silver mines.²⁵⁰

<i>Date</i>	<i>Allen (2012)</i>	<i>Mayhew (2012)</i>	<i>Palma (2017)</i>
1351	£0.6–0.9m	£0.69m	£0.64m
1377	£1.42–2.39m	£1.36m	£1.58m
1422	£1.22–1.35m	£1.09m	£1.62m
1470	£0.75–£0.95m	£0.94m	£0.85m
1490	N/A	£1.06m	£0.68m
1500	N/A	£1.06m	£0.60m
1510	N/A	£1.67m	£1.12m
1526	N/A	£1.66m	£1.40m

FIGURE 2.10

Estimates of the English Money Stock

[Allen, *Mints and Money*, p. 344; Mayhew, ‘Quantity Theory of Money in Historical Perspective’; Palma, ‘Money Supply’.]

There are far fewer estimates of the Scottish money stock, and certainly no annual estimates like those that Mayhew and Palma have provided for England. In the late thirteenth century, the issues of Alexander III amounted to between £130,000 and £180,000, which was a remarkable growth from the £50–60,000 that Mayhew estimated for mid thirteenth-century Scotland.²⁵¹ The output of the Scottish mints between 1357 and 1390 is reckoned to have exceeded £100,000, according to the die estimates. There was also a good deal of foreign coin circulating in Scotland, with hoard evidence suggesting that as much as an additional 50% of money stock might have been present in the form of English

and Prices’, p. 46.

²⁵⁰ See Section 2.1.1 above.

²⁵¹ B. H. I. H. Stewart, ‘The Volume of Early Scottish Coinage’, in D. Metcalf (ed.), *Coinage in Medieval Scotland (1100–1600): The Second Oxford Symposium on Coinage and Monetary History*, BAR, Vol. 54 (Oxford, 1977), p. 70; N. J. Mayhew, ‘Alexander III—A Silver Age? An Essay in Scottish Medieval Economic History’, in N. H. Reid (ed.), *Scotland in the Reign of Alexander III 1249–1286* (Edinburgh, 1990), pp. 63–4.

coin.²⁵² This gives a total of some £150,000 in circulation in the late fourteenth century.²⁵³

The changing geographical boundaries of the Burgundian Low Countries have also deterred the construction of money stock estimates for Flanders and Brabant. It was seen above that it was common for the Burgundian Low Countries to issue imitation coins that were slightly lighter than their genuine counterparts, which speaks of a constant struggle for bullion. Combined with the lack of native gold and silver supplies, it is probable that the Low Countries suffered from a constant drain of gold and silver. However, it has been supposed by Munro that the striking of petty 'black' money was able to meet the demands of the domestic markets throughout the late medieval period, apart from between 1440 and 1470.²⁵⁴

Though there are money stock estimates only for England, it is still possible to gain an insight into periods of potential money scarcity and abundance by looking at mint output data. It is to this task that the next section now turns.

2.2 OUTPUTS OF THE MINTS

Mint output figures allow for the impact of debasement and the shifting bimetallic ratios to manifest themselves. We would expect output to be higher in periods of debasement when more individuals brought their bullion to the mints. Output could also reflect the

²⁵² Gemmill and Mayhew, *Changing Values*, p. 140; N. Holmes, 'The Evidence of Finds for the Circulation and Use of Coins in Medieval Scotland', *Proceedings of the Society of Antiquaries of Scotland*, Vol. 134 (2004), pp. 241–80.

²⁵³ In addition to any other foreign coin that might have been circulating. Certainly, there was foreign gold coin circulating in 1385, as an act on 17 June stipulated that the French *écu* should have course for 47d., the *franc* for 42d, the Flemish *écu* for 41.5d, and the French *mouton* for 50d. *RPS*, 1385/6/3.

²⁵⁴ Munro, 'Deflation and the Petty Coinage', p. 393, 404.

metal favoured by the mint—if the mint price was more favourable to gold, the gold output would rise relative to silver output. Evidence of the output favouring one metal relative to the other could also indicate which type of metal was more likely to have been in abundance in circulation. This in turn could have implications for prices—if there was a lack of small change or silver currency, then there might well have been a deflationary effect on prices even if the amount of gold in circulation was ample. Furthermore, by establishing when mints were at their most productive, it will be possible to highlight potential years of money-induced inflation in subsequent chapters—if a period of price inflation is accompanied by a period of high mint output following a debasement, then it is reasonable to suppose causation.

English historians are fortunate that there is a fairly complete set of mint data available. Data is predominantly from the London mint, but there is also output data for the Calais mint prior to 1365 and after 1422. However, there are some periods when the documents from the London mint appear to have been lost. Notable gaps include: 4 November 1375–15 May 1381; 15 May 1381–29 September 1383; and 17 January 1390–16 January 1393. There is also a substantial data gap in the fifteenth century. According to Allen, no accounts were made between 29 September 1489–14 October 1494.²⁵⁵

It is not possible to fill all the data gaps in the mint records of the London mint. It is, however, possible to estimate the output of gold between 29 September 1489 and 14 October 1494. The proposed method of filling the data gap is to use the Asthall Hoard to

²⁵⁵ Allen, *Mints and Money*, pp. 416–23.

estimate the mint output during these years. The Asthall Hoard, probably deposited some time around 1515, is a high-value hoard containing 192 angels and 16 half-angels.²⁵⁶ If the hoard can be deemed to be a likely representative cross section of the circulating coins in the early sixteenth century, then it is possible to work out how many of each type were struck, which will then enable the mint output gaps to be filled. The strength of the relationship between the number of coins found in the hoard and the number of the same type struck at the London mint can be tested by calculating the correlation coefficient, which returns a figure of 0.7022.²⁵⁷ While this is not an unquestionably strong relationship, the figure is high enough to suggest that there is a good chance that the frequency of coin types struck by the mint and those found in the Asthall Hoard are fairly likely to be related.²⁵⁸ Using Asthall to model the missing years of mint output was a fairly straightforward procedure. The total value of each coin type was totalled up and averaged, giving an annual average value. Each annual mint output figure was divided by the corresponding value of coins from that year in the hoard. Once this had been done for all years with complete data, all the figures were averaged out. The result was 26988.2866. For years of missing data, the value of the Asthall Hoard's coins for that year were multiplied by that number, giving estimates of what might have been struck by the mint. These new values have now been added to the data compiled by Munro, giving annual

²⁵⁶ My thanks to Dr Julian Baker and Lucy Moore for allowing me to use their data on the Asthall Hoard prior to publication. This idea was originally proposed in my MSt thesis: Ball, 'Royal Wealth', pp. 27–37.

²⁵⁷ For an explanation of correlation coefficients, see S. L. Jackson, *Statistics Plain and Simple* (Boston, 2017), p. 243.

²⁵⁸ For a good explanation of the significance of correlation results, see G. W. Corder and D. Foreman, *Nonparametric Statistics for Non-Statisticians: A Step by Step Approach* (Hoboken, 2009), p. 81.

gold output figures for the whole late medieval period, Figure 2.II.²⁵⁹

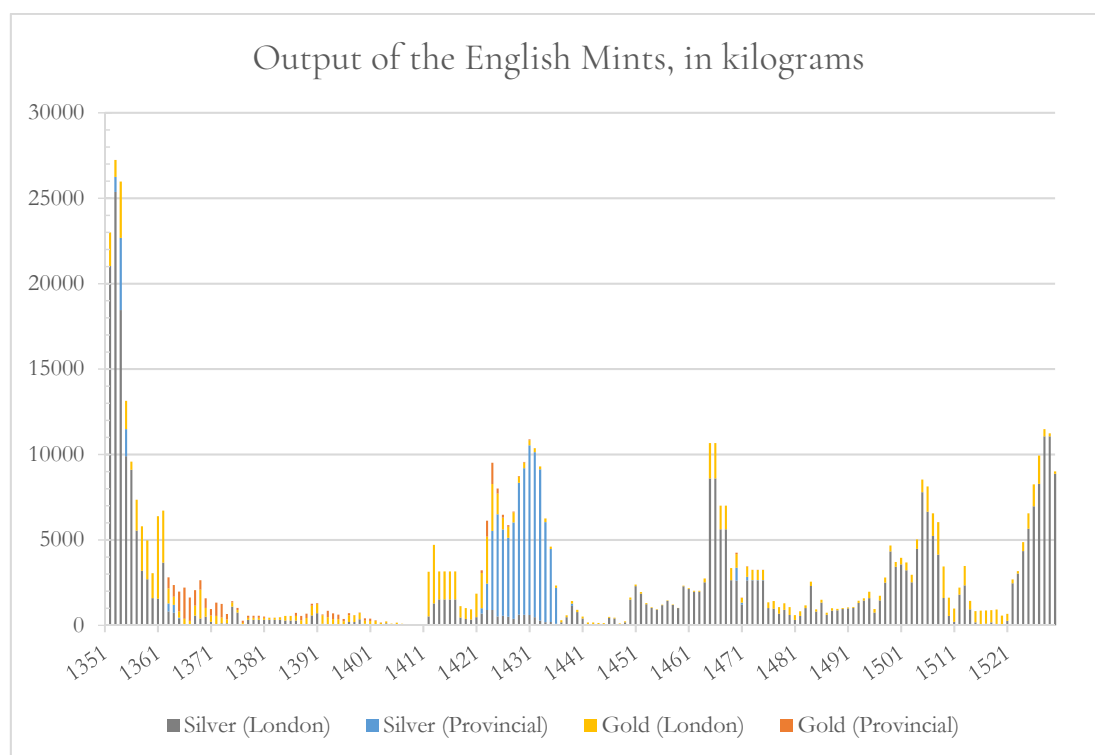


FIGURE 2.II

[Munro, 'English Mint Output Data' (29 June 2018); Ball, 'Royal Wealth', pp. 27–37.]

A number of observations emerge from the output of the English mints. Most obviously, there were no periods of output as high as that of the 1350s. Output does appear to have been at its lowest during the bullion famine, which is unsurprising given that the Durham mint closed between 1394 and 1412, and the York mint's output declined heavily

²⁵⁹ Munro filled the mint gaps using averages based on surrounding years. These have been kept for all but the gold estimates that I have just entered, which is why we are now left with a complete set of mint output data, despite the limitations caused by missing entries. Allen has also provided a series of mint output data in *Mints and Money*, Appendix C, Table C.3. However, I have opted to use Munro's data for a number of reasons. His source is predominantly C. E. Challis (ed.), *A New History of the Royal Mint* (Cambridge, 1992), as is the case for Allen, *Mints and Money*, p. 405, but Munro's data has the added benefit of being annualised and converted into kilograms, whereas Allen's data remains in sterling and uses the original minting periods which tend to straddle multiple years. The separation of the provincial mints (York, Durham, Bristol and Calais) is also beneficial.

in the late fourteenth century. Part of this decline could have been caused by the Flemish issue of imitation English nobles, which were more attractive than English nobles, assuming the Flemish coins passed at tale. It is therefore possible that the northern mints suffered from a brief preference for Flemish nobles, which thus reduced the amount of gold that the northern mints could provide, further disincentivising merchants from visiting.²⁶⁰ The debasement of 1411 saw heightened output, especially for gold, even though it was only a small reduction in currency weight. Though the Calais mint was closed between 1365 and 1422, a number of petitions in 1421 requested the reopening of the mint, which was agreed to in December that year.²⁶¹ The output of the Calais mint was extremely high in the 1420s and 1430s, as wool merchants temporarily favoured silver when the Low Countries and Scotland were pro-gold.²⁶² The 1429 Ordinance of Partition and Bullion also encouraged the Calais mint output to reach hitherto unseen levels. Though the ordinance was unpopular and ultimately detrimental to trade, its stipulation that a third of the purchase price of wool was to be brought to the Calais mint in either gold or silver does appear to have been obeyed—over a third of the values of wool exports in the customs accounts between 1429–36 are reflected in the Calais mint output.²⁶³ The conflict between England and Burgundy in the 1430s appears to tally with the end of the Calais minting boom. Mint outputs then dropped in the 1440s and 1450s, though not in the same persistent manner as they had at the turn of the fourteenth century, before enjoying a

²⁶⁰ Allen, *Mints and Money*, pp. 270–1.

²⁶¹ M. Allen, 'The Proportions of the Denominations in English Mint Outputs, 1351–1485', *BNJ*, Vol. 77, No. 1 (2007), p. 193; Allen, *Mints and Money*, p. 272.

²⁶² See Figure 2.9.

²⁶³ Lloyd, *Wool Trade*, p. 262; Allen, *Mints and Money*, p. 272.

revival after Edward IV's debasement in 1464. Output is again high at the start of the sixteenth century, even though there was no debasement, suggesting that the new sources of bullion from central Europe must have passed through the English mints. The debasement of Henry VIII in 1526 was also conducive for the high output of silver in the 1520s, though it is noteworthy that the outputs were already on the rise before the debasement was initiated.

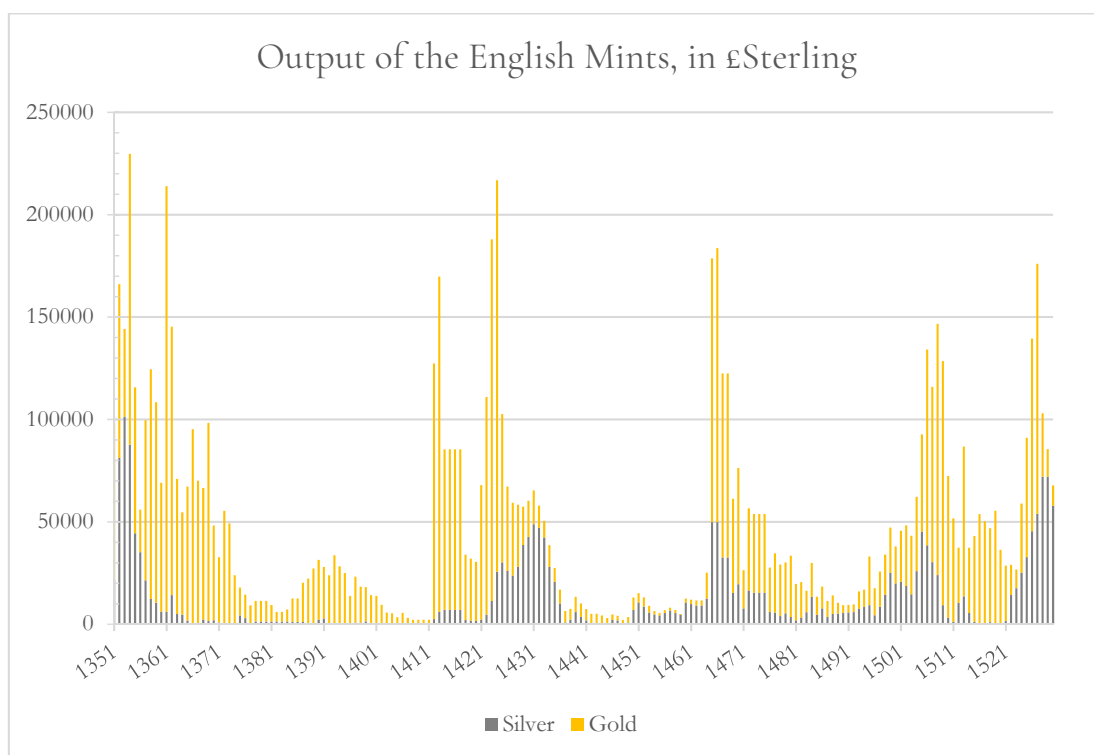


FIGURE 2.12
[As Figure 2.11]

As was demonstrated by the calculation of bimetallic ratios above, the value of gold was often twelve times higher than that of silver. Consequently, simply examining mint output in kilograms does not necessarily offer an insight into the amount of *money* coming out of the mints. Thus, Figure 2.12 shows the value of annual mint output. The most

obvious difference is that there was a higher proportion of gold in the total money supply than Figure 2.11 suggests. Furthermore, while the overall peaks and troughs remain consistent, the output of the 1350s no longer seems to dwarf that of the fifteenth century. While we can still attribute certain periods of decline to the crisis narrative of the bullion famine and the mid fifteenth-century 'slump', these periods do not, in fact, appear out of place—the overall impression of English mint output appears to be extremely cyclical. Outputs peak during debasements, which were initiated only every fifty years, and subsequently decline until the next. Already it is necessary to question whether such trends in England are indicative not of a country struggling during a bullion famine or monetary crisis, but of a desire to maintain a stable supply of money in circulation. To discern this we must now ask how representative England's cyclical mint output was of the 'bigger picture' by comparing her data to that of Scotland, Flanders and Brabant.

Up to now, there has been no attempt to offer a time series of Scottish mint output akin to those available for England and the Low Countries. I have, however, been able to construct one using the data available in Cochran-Patrick's *Records of the Coinage of Scotland*, which offers a collection of sources concerning mint activity.²⁶⁴ The data can be obtained by using the record of how many pounds and ounces were struck, or by deriving this figure using recorded seigniorage.²⁶⁵ There are many years where there is no recorded mint output, and it is unclear whether these are omissions on account of there being no mint activity, or whether the records have been lost. I am inclined to assume that a great

²⁶⁴ Cochran-Patrick, *Coinage of Scotland*, i, pp. 1–67.

²⁶⁵ For an explanation of Scottish minting weights and measures, see Gemmill and Mayhew, *Changing Values*, p. 114.

number of records have been lost, given there are periods of known debasement with no corresponding mint output data.²⁶⁶ Thus, I stress that these figures must be treated as approximations. Nevertheless, by converting the data into kilograms, it is possible to discern the possible trend of Scottish mint output, Figure 2.13.

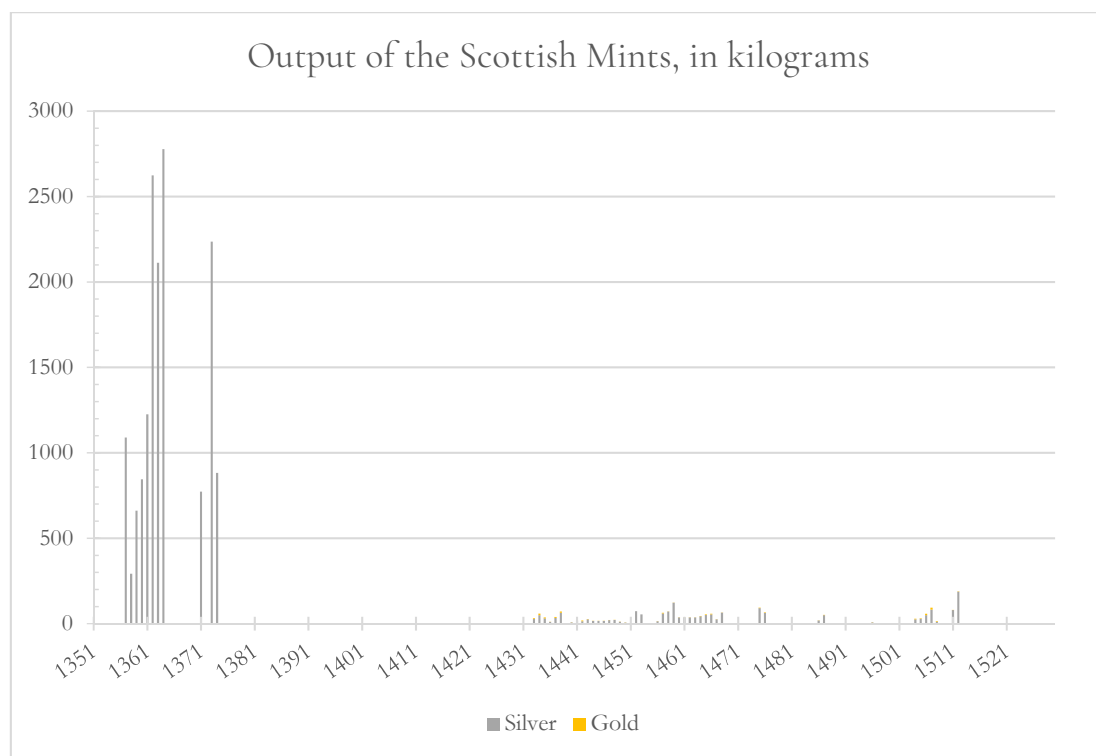


FIGURE 2.13

[Cochran-Patrick, *Coinage of Scotland*, i, pp. cviii–cxxxv, 1–67; Gemmill and Mayhew, *Changing Values*, pp. 114–42; Bateson, *Coinage in Scotland*, pp. 54–96; Stewart, *Scottish Coinage*, pp. 134–48.]

Like England, the output of bullion was highest in the middle of the fourteenth century. In the fifteenth century, the Scottish mints produced very little bullion, in terms of both gold and silver. However, given that it was shown above that Scotland operated a policy of heavy debasement, the weight of pure bullion coming out of the mints is not

²⁶⁶ Such examples being the debasement of 1393, and those of the early 1400s, 1420s and 1520s.

indicative of the availability of currency. Figure 2.14 therefore shows the value of the output of the mints. Where the sources noted that an amount of silver was to be struck into small change, such as placks or pennies—which included alloy in the fifteenth century—the figure has been expressed in terms of billion value. Silver destined for groats has been kept separate.

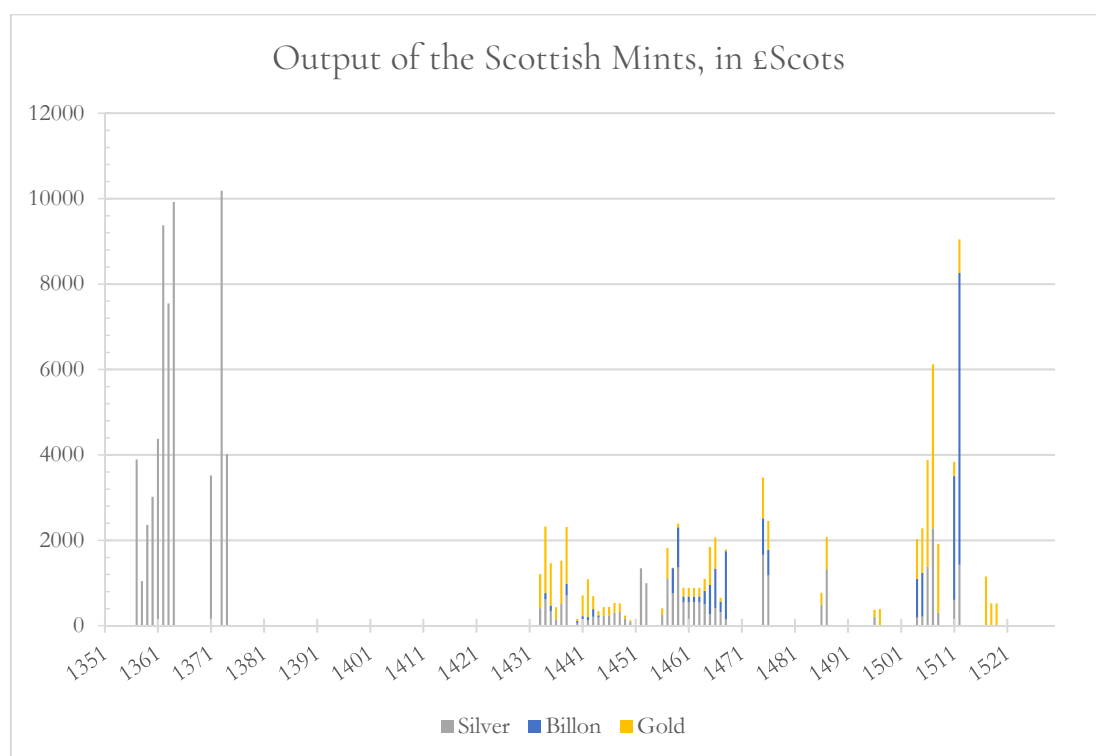


FIGURE 2.14
[As Figure 2.13]

Figure 2.14 shows that the heavy Scottish debasement in the fifteenth century must certainly have helped to offset what would otherwise have been a severely depleted money stock. However, not all debasements and corresponding high mint output can be equated with a large increase in the Scottish money stock. It is highly likely that the 1367 debasement had been initiated to cheapen the ransom payments of David II. Huge amounts of

coinage were thus exported to England, which prevented the debasement from increasing the money stock. Though the Scots stopped paying the ransom when Richard II came to the throne in 1377, this had still caused currency to flow out of Scotland for twelve years. At £4,000 a year, and a total of £48,000 for the entire decade, this was a cripplingly huge amount of money for a country that probably had less than £200,000 of currency in total.²⁶⁷ Though this is a rather extreme case, silver and gold coins would also have been prone to export through trade in the fifteenth century. The low intrinsic value of billon coins, however, probably meant that they remained in domestic circulation.²⁶⁸ These billon coins, as Figure 2.14 shows, had enormous potential to increase the money stock, especially if we consider that they were less prone to export. Unfortunately, there is no mint output data for the period during which James III flooded the market with black money, but Murray has estimated that before the Lauder Bridge crisis of 1482, some £50,000 worth of black money might have been struck. Relative to the value of outputs of surrounding years, it is easy to see why there was such mass dissent following their introduction.²⁶⁹

Offering a summary of Flemish and Brabantine mint output data is far more straightforward, on account of Munro's extensive work on the topic. Since it was shown above that money tended to flow between Flanders and Brabant, even before the official currency unification of 1433, I have combined the outputs of both the Flemish and Bra-

²⁶⁷ Value of David II's ransom from Grant, *Independence and Nationhood*, 231–2.

²⁶⁸ Munro, 'Deflation and the Petty Coinage', pp. 404–5, 407.

²⁶⁹ Murray, 'Black Money of James III', p. 125.

bantine mints. Figure 2.15 shows that, as in England and Scotland, the highest mint output was in the fourteenth century. There was also a good deal of gold coming out of the Flemish mint in the late fourteenth century.²⁷⁰ The evidence of a bullion famine is still present in the Low Countries mint output, though the decline does not initially appear to have been as severe as it was in England during this period. The series of debasements in the late fourteenth century must certainly have helped to offset any falling availability of bullion in this period, caused by either the lack of silver coming from mining or the declining balance of payments resulting from the collapse of the Flemish cloth industry. These measures only staved off the inevitable, but it was not until the opening of the fifteenth century when the Low Countries mints ceased to operate for a few years. However, Philip the Good's promise not to alter the currency for a number of decades following his 1433 reinforcement and unification brought with it, unsurprisingly, a sharp decline in mint output; without the lure of profits arising from debasement, merchants were not incentivised to bring their bullion to the mints.

By converting the outputs of the Flemish and Brabantine mints into their equivalent values in pound *groots*, the preference for gold in the fourteenth century meant that it dominated the value of bullion produced, Figure 2.16. Though this was to the advantage of the Flemish and Brabantine merchants, it was not ideal for domestic exchange, which required smaller denominations. The output of silver dried up during the central decades of the fifteenth century, but was revived when there was a fresh debasement in 1466. The

²⁷⁰ There is no mint data for Brabant prior to 1420.

resumption of the Burgundian policy of frequent debasements and reinforcements ensured that bullion continued to flow to the mints for the remainder of the fifteenth century and into the sixteenth.

The picture of mint output in Flanders and Brabant appears to have been somewhat poor by the middle of the fifteenth century, with the pro-gold bimetallic ratio ensuring that the mints received more gold than silver. Though this would have depleted the amount of white silver money in circulation, much to the detriment of the domestic economy, the use of black money most likely offset most of the damage. Figure 2.17 shows that the output of black money in Flanders was substantial at the end of the fourteenth century and in the second half of the fifteenth century.²⁷¹ Output dried up entirely in the 1350s and 1360s, and was low in the middle of the fifteenth century. However, as Munro has acknowledged, the output of black money should have had a more cumulative effect on the money stock than white or gold output because the difficulty and cost of reminting heavily alloyed coins deterred both mints and mint-goers. Their low intrinsic and tale value also made them unattractive to merchants, ensuring that petty coins were primarily used for small domestic transactions.²⁷²

Though mint outputs do not provide a perfect indication of the quantity of money in circulation, they do at least draw attention to periods of money scarcity and abundance. Thus, in the Low Countries, it appears that there was a good deal of money about in the

²⁷¹ I have been unable to find output data for black money in Brabant. While the output of Flemish money can act as a useful indication for the southern Low Countries, it is important to note that petty coinage smaller than a quarter *groot* was not included in the monetary unification of 1433, and thus did not circulate as universally in the Burgundian Netherlands. See Spufford, *Monetary Problems and Policies*, p. 42.

²⁷² Munro, 'Deflation and the Petty Coinage', pp. 404–5, 407.

late fourteenth century, but that this declined in the early fifteenth century. There was a brief resurgence in the 1420s and 1430s, but then the lack of debasement for the two decades following Philip the Good's money unification of 1433 caused mint output to mostly dry up. It is unlikely that even the black money was able to offset this shortage of currency.²⁷³ The resumption of debasement in the 1460s meant that there was a good deal of gold, white and black money coming out of the mints. The early sixteenth century saw another shift towards gold output, which again would have increased reliance on black money within the domestic economy.

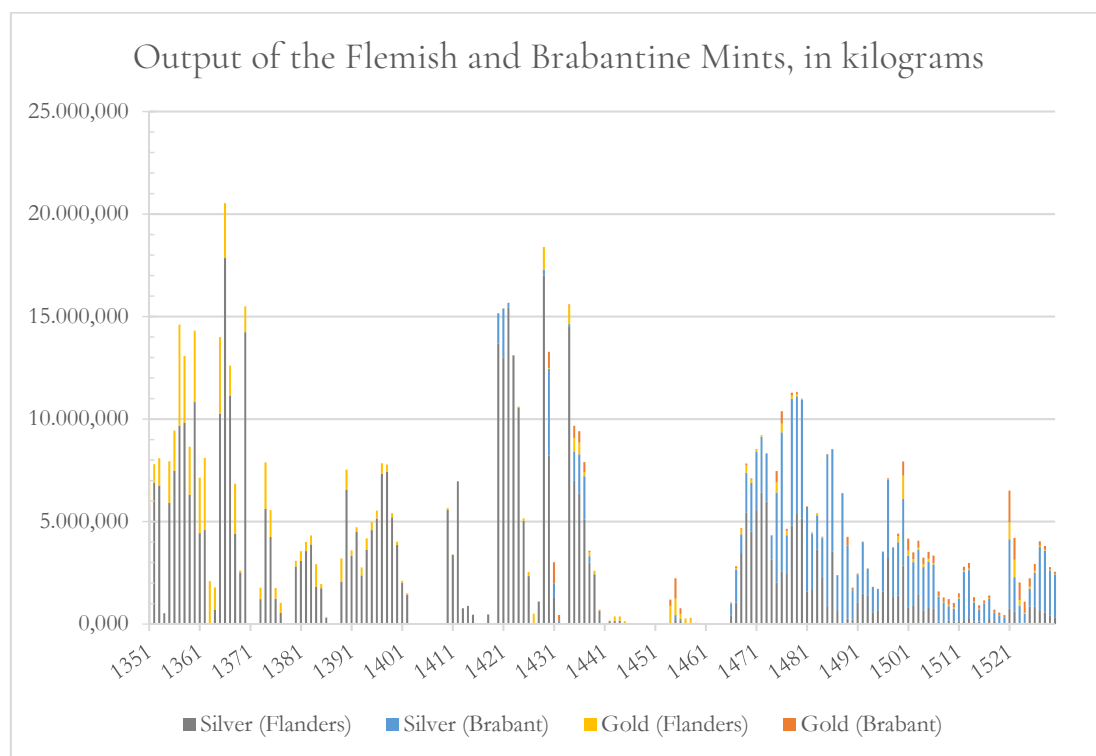


FIGURE 2.15
[Munro, 'Flemish and Brabantine Mint Output Data' (29 June 2018).]

Some conclusions have arisen from the comparison of mint outputs and the detailed

²⁷³ *Ibid.*, pp. 393, 404.

study of each country's monetary policy. By comparing the mint outputs and debasements of England, Scotland, Flanders and Brabant, we can see that England's experience is atypical in a number of respects. This has further strengthened the preliminary finding that England's currency was unique in its high and stable valuation on the international market. Though England shares the decline in mint output that was widespread at the turn of the fourteenth century and also in the middle of the fifteenth, these instances occurred within periods of no debasement—England's debasements of 1411 and 1464 appear to have been at the end of each 'crisis'. Regardless of bullion availability, it seems, England maintained a cyclical pattern of mint output by debasing only every fifty years, and these debasements were never severe. In contrast, Scotland, Flanders and Brabant used heavy debasement and changes to the bimetallic ratio to attract bullion to the mints and in an attempt to offset shortages. Of course, mint outputs do not tell us how much money accumulated and how much was lost through trade, so they offer only a rudimentary glimpse of the potential quantity of money in circulation, but a glimpse nonetheless. This information is crucial for the later examination of the relationship between the availability of money and corresponding fluctuations in the trends of prices, rents and wages.

2.3 POPULATION TRENDS

It is also necessary to consider whether England's population trends differed from those of her trading partners. Population levels are a key determinant of changing demand pressure, and are thus crucial to understanding how prices, wages and rents could be affected by reduced—or heightened—demand for both commodities and money.

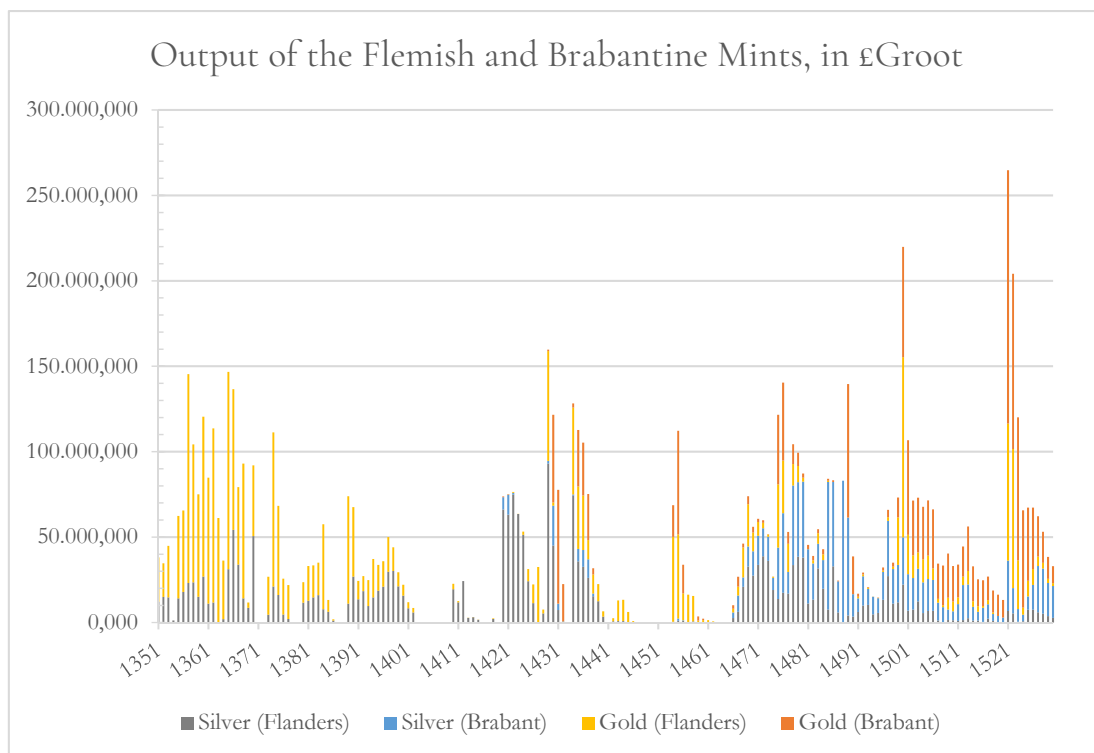


FIGURE 2.16
[As Figure 2.15]

The fourteenth century brought with it one of the largest demographic crises in history—the Black Death. It is generally agreed that the plague, which arrived in England in 1348 and returned in 1361, 1369, 1374 (south), 1379 (north), and 1390, reduced the English population by well over 30% initially and at least 50% overall.²⁷⁴ As for Scotland, Black Death struck in 1349/50, and came back in 1362, 1380, 1392 and 1401 (following the English

²⁷⁴ R. Horrox, ed., *The Black Death* (Manchester, 1994), 3–13, 62–92; Hatcher and Bailey, *Modelling the Middle Ages*, pp. 27–65; Dyer, *Making a Living*, p. 233; Hatcher, *Plague*, pp. 21–2, 71; Broadberry et al., *British Economic Growth*, pp. 12–22. There are also estimates of population trends for particular towns. For example, Bury St Edmunds is thought to have suffered from a population loss of about 41% between 1347 and 1377. The Abbey’s manors show that the population continued to decline to around the middle of the fifteenth century. R. S. Gottfried, ‘Bury St Edmunds and the Populations of Late Medieval English Towns’, *Journal of British Studies*, Vol. 20, No. 1 (1980), pp. 12–14, 16.

plagues, apart from in 1369). However, the Scottish chronicles devote much less space to the plague than English ones do, and (for the first outbreak) give a morbidity rate of 33% per cent—‘a third of the human race was killed’, wrote John of Fordun—rather than the 80–90 per cent (4 out of 5, 9 out of ten) found in most of the English chronicle accounts.²⁷⁵ The fact that there was no Scottish equivalent of the 1369 plague in England also indicates that Scotland did not suffer quite so much. Moreover, in the plague years of 1362 and 1380, the Scottish kings David II and Robert II each spent several months in the north of Scotland, between Aberdeen and Inverness,²⁷⁶ which suggests that in those years plague was limited to the southern and central regions. In general, therefore, it may be that the Scottish experience of plague was not quite so bad as England’s, possibly because in northern Scotland population density was considerably lower than in the south—though this can only be a tentative suggestion, given the lack of hard evidence.²⁷⁷

²⁷⁵ Grant, *Independence and Nationhood*, pp. 73–9; K. Jillings, *Scotland’s Black Death: The Foul Death of the English* (Stroud, 2003), pp. 13–14, 22–44, 58–64, 72. The main chronicle accounts are: *John of Fordun’s Chronicle of the Scottish Nation*, ed. W. F. Skene (2 vols., Edinburgh, 1872; repr. Lampeter 1993), ii, pp. 359, 369 (for 1349/50, 1362); Andrew Wyntoun, *The Orygynale Cronykil of Scotland*, ed. D. Laing (3 vols, Edinburgh, 1872), ii, pp. 482, 505, iii, pp. 15, 38 (for 1349/50, 1362, 1380, 1401); and Walter Bower, *Scotichronicon*, ed. D.E.R. Watt *et al.* (9 vols., Aberdeen and Edinburgh, 1987–98), vii, pp. 273, 319, 381; viii, p. 39 (for 1349/50, 1362, 1380, 1401). None of these, however, mention the 1392 plague; for this, see *Exchequer Rolls*, iii, 310, where it is stated that chamberlain’s courts could not be held that year because of plague.

²⁷⁶ In 1362, David II went north sometime between late May and early September and stayed there until 20 January: *The Acts of David II King of Scots*, ed. B. Webster (Edinburgh, 1982), pp. 309–17. Bower, *Scotichronicon*, vii, p. 319, states that he was ‘accompanied by many of the more wealthy and more noble men of the kingdom [...] because of fear and alarm at that pestilence which was then spreading in the southern parts of the kingdom, and which he planned to escape in good health’. Similarly, in 1381 Robert II was in the North from the end of July to the end of October, as the comprehensive summary of Robert II’s *acta* compiled by the late A.L. Murray (nos. 375–382) shows, which is now in the possession of Dr Alexander Grant, to whom I am most grateful.

²⁷⁷ See also K. Duncan, ‘The Possible Influence of Climate on the Bubonic Plague in Scotland’, *Scottish Geographical Magazine*, Vol. 108, No. 1 (1992), pp. 29–34. It should be noted that for Norway – which might be thought to be similar to Scotland – Ole Benedictow claims that mortality rates in the countryside during

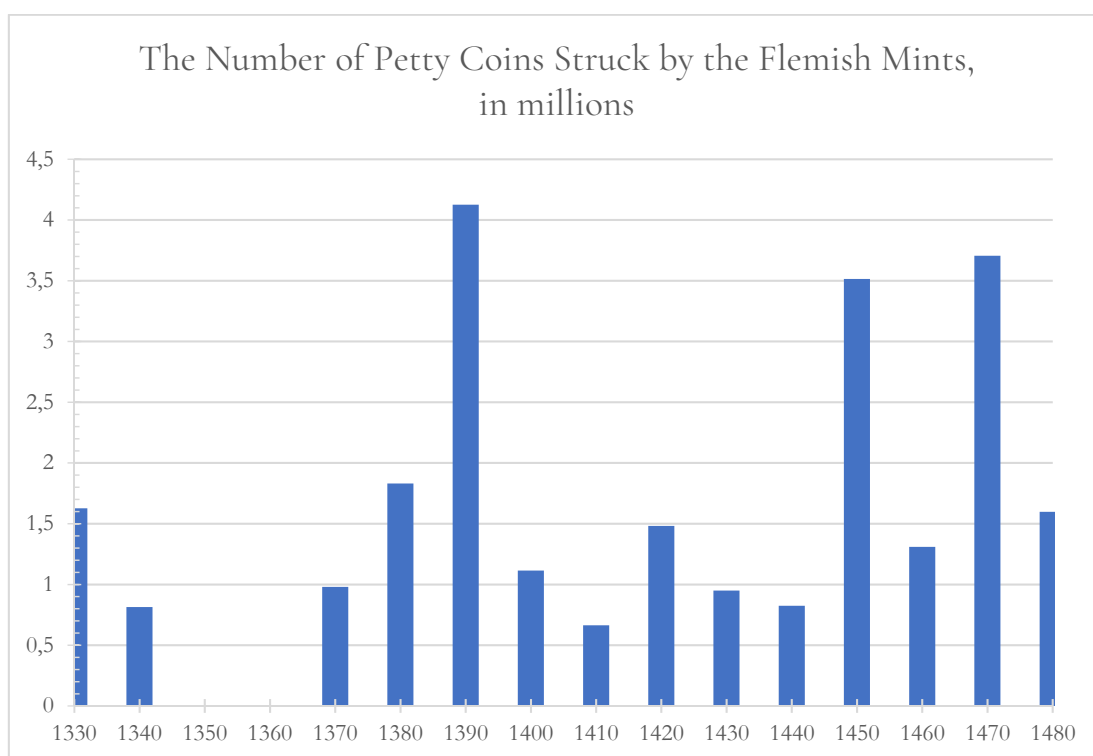


FIGURE 2.17
[Derived from Munro, 'Deflation and the Petty Coinage', p. 396.]

The effect of the Black Death in the Low Countries has been debated. In 1950, van Werveke suggested that only the fringes of Flanders were affected by the plague.²⁷⁸ This argument has been contested in recent years. Benedictow argued that 27% of the Flemish population was wiped out by plague.²⁷⁹ In addition, Vandeburie noted that 26.5% of the staff and donors of the Hospital of Our Lady of the Potterie were killed by the Black Death, and between August and September 1349 there was a general mortality rate of

the years 1349–53 were 40–50%: O. Benedictow, *Plague in the Late Medieval Nordic Countries: Epidemiological Studies* (Oslo, 1992), p. 142. However, James Brothen's 'Population Decline and Plague in Late Medieval Norway', *Annales de Démographie Historique* (1996), concludes that Benedictow's largely theoretical arguments are taken too far, and other more general reviews say much the same, especially that of his *Black Death* (see note 279) by Rosemary Horrox in *EHR*, Vol. 121 (2006), pp 197–9.

²⁷⁸ H. van Werveke, *De zwarte dood in de Zuidelijke Nederlanden 1349–1351* (Brussels, 1950).

²⁷⁹ O. Benedictow, *The Black Death, 1346–1353: The Complete History* (Woodbridge, 2004), p. 112.

30.5% in Bruges.²⁸⁰ Both the Duchy of Brabant and so-called Walloon-Brabant were also affected by the plague between 1349 and 1350, though precise mortality rates are not known.²⁸¹

Evidence of mortality rates are usually quite anecdotal, which makes it difficult to conclude for certain that more of the English population was wiped out by plague than the populations of Scotland and the southern Low Countries. However, the estimates of general mortality rates do suggest that those of Scotland and the southern Low Countries fell towards the lower limit of estimated death rates in England.²⁸² Of course, the concern of this thesis is not only with the mortality rates of the Black Death, but also with the long-term population trends of each country—these are crucial for understanding whether demographic factors could have a long-term impact on prices, wages and rents, and provide a vital component in the construction of per capita mint output.

The most frequently cited population estimates for England are those given by Hatcher, who put the population of 1300 at about 6 million,²⁸³ which fell to below 4 million after the Black Death. Population decline continued into the fifteenth century,

²⁸⁰ J. Vandeburie, 'De zwarte dood te Brugge: Een status questionis en enkele nieuwe beschouwingen', *Handelingen van het Genootschap voor Geschiedenis te Brugge*, Vol. 147, No. 2 (2010), p. 299. The records of St John's Hospital, Bruges, also show that mortality rates were high during the Black Death years. It is noted that the period 1349–51 saw 14 deaths in the hospital. Given there were 12–13 people normally working at the hospital in the middle of the fourteenth century, this was significant. Indeed, the death rate of 1350–1 alone was recorded at 7 people, whereas other years not affected by plague often had 0–3 deaths. G. Maréchal, 'De zwarte dood te Brugge, 1349–1351', *Studia Historica Gandensia*, Vol. 244 (1980), pp. 379–80.

²⁸¹ Benedictow, *Black Death*, pp. 116–17.

²⁸² Pounds also remarked that the Low Countries was affected less severely. N. Pounds, 'Population and Settlement in the Low Countries and Northern France in the Later Middle Ages', *Revue Belge de Philologie et d'Histoire*, Vol. 49, No. 2 (1971), p. 379.

²⁸³ This fits with Postan's estimate in Postan, 'Medieval Agrarian Society', pp. 549–632.

reaching a nadir of about 2.5 million in the middle of the fifteenth century.²⁸⁴ Russell's post-Black Death population figure sat lower still; he reckoned that 2.25 million people lived in England in 1377.²⁸⁵ More recent estimates of the English population have revised the figures downwards. Recent work from Campbell has suggested that England's land could not have supported a population of 6 million in 1300. When the Domesday Book was compiled, there were 5.75–6 million arable acres to feed 1.5–2.5 million people. During the Napoleonic Wars, there were 10.7 million arable acres being cropped. Thus, to support a doubling of the Domesday population to c.6 million, a comparable amount of land to the nineteenth century would have been required, which Campbell argues is unlikely.²⁸⁶ Thus, Broadberry *et al.*'s population estimates have suggested that the English population stood at about 4.69 million in 1315, dropping to 4.12 million in 1325. On the eve of the Black Death, the population was estimated to be about 4.81 million. This is over 1 million people fewer than the estimates given by Hatcher, though Broadberry *et al.* still stick to a mortality rate of 50%, giving a population estimate of 2.08 million in 1400. They

²⁸⁴ Hatcher, *Plague*, p. 71.

²⁸⁵ Russell, *Population*, pp. 6–14.

²⁸⁶ B. M. S. Campbell, *English Seigniorial Agriculture, 1250–1450* (Cambridge, 2000), pp. 388–90. However, recent work by Clark has suggested that the higher the population, the further economic and agrarian efficiency fell. Clark, 'Microbes and Markets', pp. 155–61. This makes it even more unlikely that a deficit in land availability could have been offset by greater efficiency before the Black Death in order to support a larger population. In addition, Clark has suggested that Broadberry *et al.* have overestimated the rise of farm output and the rate of economic growth between 1270 and 1770. Furthermore, he concludes that he favours population estimates at the higher end of the range given by Broadberry *et al.* because his work suggests that the total arable acreage and farm output could have been double that suggested by Broadberry *et al.* for the period before 1700. See Clark, 'Growth or Stagnation?'. Broadberry *et al.* have issued a response in defence of their calculations, reaffirming their belief that they have calculated growth correctly and thus stick by their original estimates of total cultivated land. See S. Broadberry, B. M. S. Campbell, A. Klein, M. Overton, and B. van Leeuwen, 'Clark's Malthus Delusion: Response to "Farming in England 1200–1800"', *EconHR*, Vol. 71, No. 2 (2018), pp. 639–64.

also conform to Hatcher's suggestion of negative replacement rates, which prevented population recovery until the middle of the fifteenth century.²⁸⁷ This slow recovery was no doubt exacerbated by the recurrent outbreaks of plague, notably the so-called 'children's' plague of 1361. Thus, Broadberry *et al.* suggest that the population of 1450 had fallen to 1.9 million, but had risen to 2.35 million by 1522.²⁸⁸

Using linear interpolation to obtain annual population estimates, it is possible to offer decennial averages based on the benchmarks provided by Broadberry *et al.* Figure 2.18 demonstrates that the English population did indeed suffer from pronounced decline until the start of a sluggish recovery from the middle of the fifteenth century onwards. Of course, the picture was almost certainly different in cities, where urbanisation offset a declining population. Williams states that the population of medieval London probably stood between 30,000 and 36,000 people in 1300, and, according to Russell, might have doubled to 60,000 by the eve of the Black Death, though this seems like a startling increase. Instead, Williams believes that 40,000 is a more reasonable estimate for London's population in 1340, and is also probably representative of the population in the 1370s.²⁸⁹ By this measure, urbanisation was able to entirely offset any of London's demographic losses caused by plague.

²⁸⁷ Hatcher, *Plague*, p. 27. Population growth was slow to pick up because many died without heirs. Not until the early 1470s did child replacement rates in East Anglia, London and Hertfordshire begin to increase. See Gottfried, 'Bury St Edmunds', pp. 12–14, 16; R. S. Gottfried, 'Population, Plague and the Sweating Sickness: Demographic Movements in Late Fifteenth-Century England', *Journal of British Studies*, Vol. 17, No. 1 (1977), pp. 12–37, p. 12.

²⁸⁸ Broadberry *et al.*, *British Economic Growth*, p. 20.

²⁸⁹ G. A. Williams, *Medieval London: From Commune to Capital* (London, 1963), Appendix A.

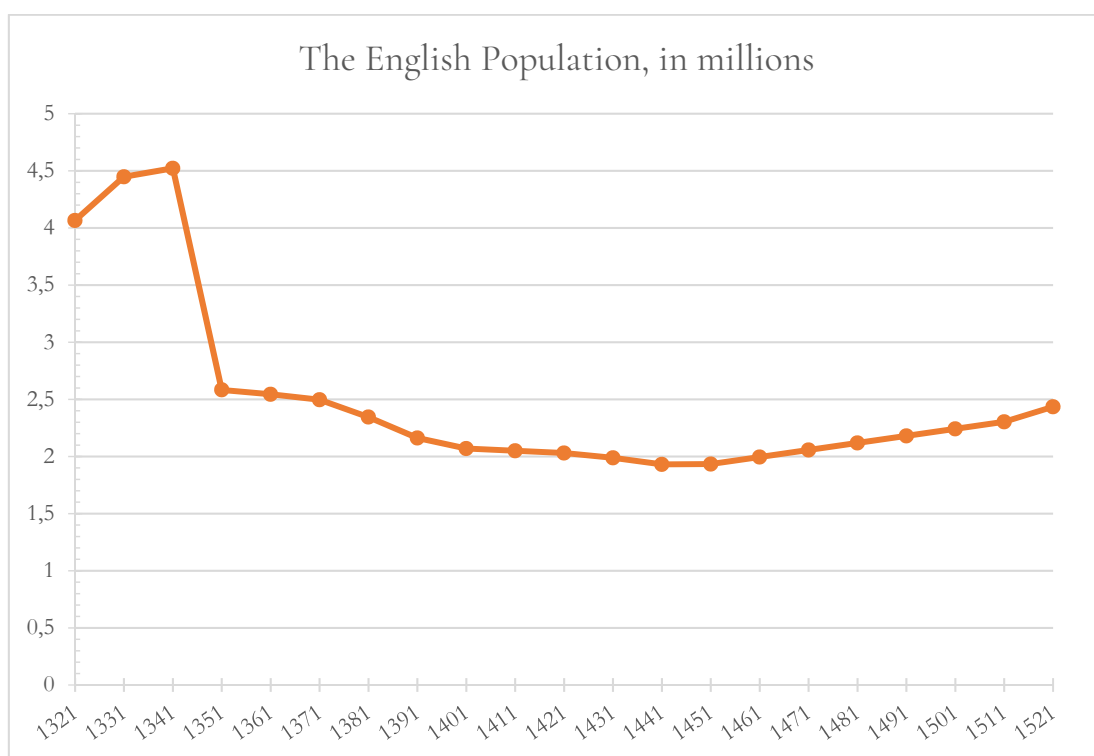


FIGURE 2.18

[Derived from population benchmarks given in Broadberry *et al.*, *British Economic Growth*, p. 20.]

Figures for the changing size of the Scottish population do not exist in the way as they do for England. As a general rule, Scottish historians have tended to assume that Scotland's population before the Black Death was about a sixth of England's. The figure is not entirely arbitrary—modern Scotland's arable is about a sixth of England's.²⁹⁰ Campbell's valid point that there needed to be sufficient land to support the population lends weight to this argument. Furthermore, Scottish wool exports were generally between a fifth and a sixth of England's, and it has been shown above that the Scottish money stock was about a sixth of England's at the start of the fourteenth century.²⁹¹ Grant states that

²⁹⁰ Grant, *Independence and Nationhood*, p. 73.

²⁹¹ Assuming there was about £180,000 in circulation during the reign of Alexander III, and £1,000,000 in

the Scottish population was about 1.1 million in 1707, and that eighteenth-century Scottish agriculture was 'little different from that of the Middle Ages'. Therefore, it is reasonable to assume that medieval Scotland could have supported about 1 million people before the plague.²⁹² This comes out at a ratio of 1:4.5 if Broadberry *et al.*'s figures are accepted, and nearer 1:6 if the Hatcher population levels are used. The c.1:6 ratio also holds true when we compare the sizes of Edinburgh and London in the sixteenth century. Edinburgh's population has been estimated at 12,500 in this period, while London is reckoned to have had 80,000 inhabitants in 1550.²⁹³

There is also some reason to suggest that the Scottish population was able to recover more quickly after the Black Death. It was seen above that replacement rates in England remained negative until the middle of the fifteenth century, where after they had begun to recover. Grant found that the Scottish nobility suffered from negative replacement rates only until the 1380s, and produced an 'abundance of sons' in the fifteenth century.²⁹⁴ But he would not claim a general application for that point: noble demographics are very different from that of the ordinary people, and in the early and mid-fourteenth century the Scottish nobility suffered very severely from warfare with England. What is more significant is two sets of general comments about the Scottish situation, one relating to the 1390s and the other to the 1480s. First, the chronicler Walter Bower, writing in the

England at this point. See Section 2.2 above.

²⁹² Grant, *Independence and Nationhood*, p. 72.

²⁹³ S. Boardman and E. Williamson, *The Cult of Saints and the Virgin Mary in Medieval Scotland* (Woodbridge, 2010), p. 186; 'The Demography of Early Modern London', <<http://www.geog.cam.ac.uk/research/projects/earlymodernlondon/>> (23 April 2016).

²⁹⁴ Grant, *Independence and Nationhood*, p. 75.

1440s but looking back to his youth in the reign of Robert III, from 1390 to 1406, stated that ‘In this king’s reign there was an abundance of provisions in the kingdom’.²⁹⁵ Second, a political poem called *The Harp*, written to criticise James III in the 1480s, calls Scotland ‘a barren land ... fertile of folk, with great scantness of food’.²⁹⁶ *The Harp*’s author may have been partly thinking about the effect of the black money, but his ‘fertile of folk’ must indicate that the population had risen significantly since the beginning of the century. However, that could not be said for England. Calculations of the English population by Broadberry *et al.* give 4.81 million for 1348, the eve of the Black Death, only 1.90 million for 1450, and 2.14 million for 1490, which is only a slight increase since 1450, and would certainly not fit the description ‘fertile of folk’. It is hard to believe, therefore, that in the fifteenth century the Scottish population did not rise at a faster rate than the English.

As for Flanders and Brabant, though we lack detailed annualised population data, there is again evidence to suggest that, as with Scotland, their populations recovered *comparatively* more quickly than England’s after the Black Death. Blockmans *et al.* have provided estimates of the total population of the small towns of Brabant for the late fourteenth century through to 1526. The figures show that small town populations had recovered by 1437, where the total stood at 63,265— a significant increase (20%) on the 1374 figure of 52,857—whereas the English population actually declined from 2.5 million to 1.9 million during roughly the same period (1377–1450). As the fifteenth century wore on, however, the population of these small towns declined slightly, reaching their lowest in

²⁹⁵ W. Bower, *Scotichronicon*, ed. D. E. R. Watt (9 vols, Aberdeen, 1987), viii, p. 63.

²⁹⁶ *The Book of Pluscarden*, ed. F. J. Skene, i (Edinburgh, 1880), p. 397.

1496, when it was 13% lower than in 1480. Thereafter recovery was in place and by 1526 the total population had crept up to 53,896.²⁹⁷ Unfortunately, the data for these towns does not provide an estimate of their total population before the Black Death struck. However, it is possible to derive a pre-plague population by using the Flemish mortality rate of 27%, and thus increasing the 1374 figure.²⁹⁸ This technique is very crude as it makes no allowance for the impact of subsequent plagues occurring between 1350 and 1374, but it nevertheless offers an approximation of the general trend of the Brabantine urban population, Figure 2.19.

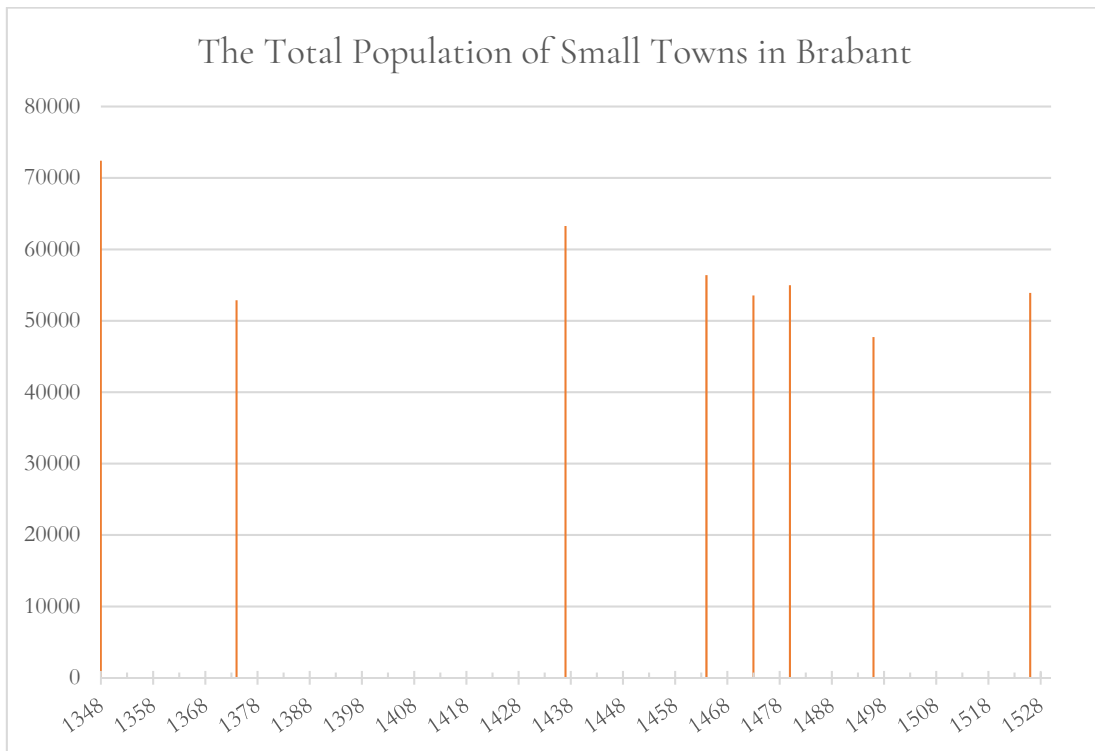


FIGURE 2.19

[Blockmans *et al.*, 'Tussen Crisis en Welvaart', pp. 44, 49, 51, 52; Benedictow, *Black Death*,

²⁹⁷ Blockmans *et al.*, 'Tussen Crisis en Welvaart', p. 52. Their figures are derived from hearth taxes.

²⁹⁸ The mortality rate is derived from Benedictow, *Black Death*, p. 112; and Vandeburie, 'Zwarte dood', p. 299.

p. 112; Vandeburie, 'Zwarte dood', p. 299; the 1348 figure is my own estimate, see p. 109.]

Incidentally, my pre-plague small towns population estimate of 72,407 tallies with Pounds' assumption that the population of the mid fifteenth-century Low Countries was probably only about 10% lower than it had been before the Black Death.²⁹⁹ Blockmans *et al.*'s figure of 63,265 for 1437 is very close to 65,166—10% lower than my proposed 1348 figure.

Of course, as indicated above, there was a dramatic difference between the stable population of London and the decline in the general population of England. In the case of England, urbanisation offset any population decline in London, but this was not true of Brabant. Blockmans *et al.* also offered an impression of general population trends in the rural areas of the Netherlands.³⁰⁰ For most of the post-Black Death period, the trends appear in line with those shown in Figure 2.19—population recovery came rapidly in the early fifteenth century, but then recurrences of plague caused some population decline in the middle of the fifteenth century.³⁰¹ This decline was gradually reversed in the early sixteenth century.³⁰² In the period between 1473 and 1480, however, a decline is detected in the Brabantine countryside while the population of small towns increased. This could well have been the result of increased urbanisation as the conflicts with Duke Maximilian encouraged individuals to seek the safety of cities.³⁰³

²⁹⁹ Pounds, 'Population and Settlement', p. 379.

³⁰⁰ Blockmans *et al.*, 'Tussen Crisis en Welvaart', p. 49.

³⁰¹ For estimates of instances of recurring plague, see J. Roosen and D. R. Curtis, 'The "Light Touch" of the Black Death in the Southern Netherlands: An Urban Trick?', *EconHR*, Vol. 72, No. 1 (2018), pp. 1–25.

³⁰² However, van der Wee suggests that the populations of Antwerp and Brussels actually increased between 1437 and 1464. See van der Wee, *Growth of the Antwerp Market*, ii, pp. 69–70.

³⁰³ K. F. Helleiner, 'The Population of Europe from the Black Death to the Eve of the Vital Revolution', in

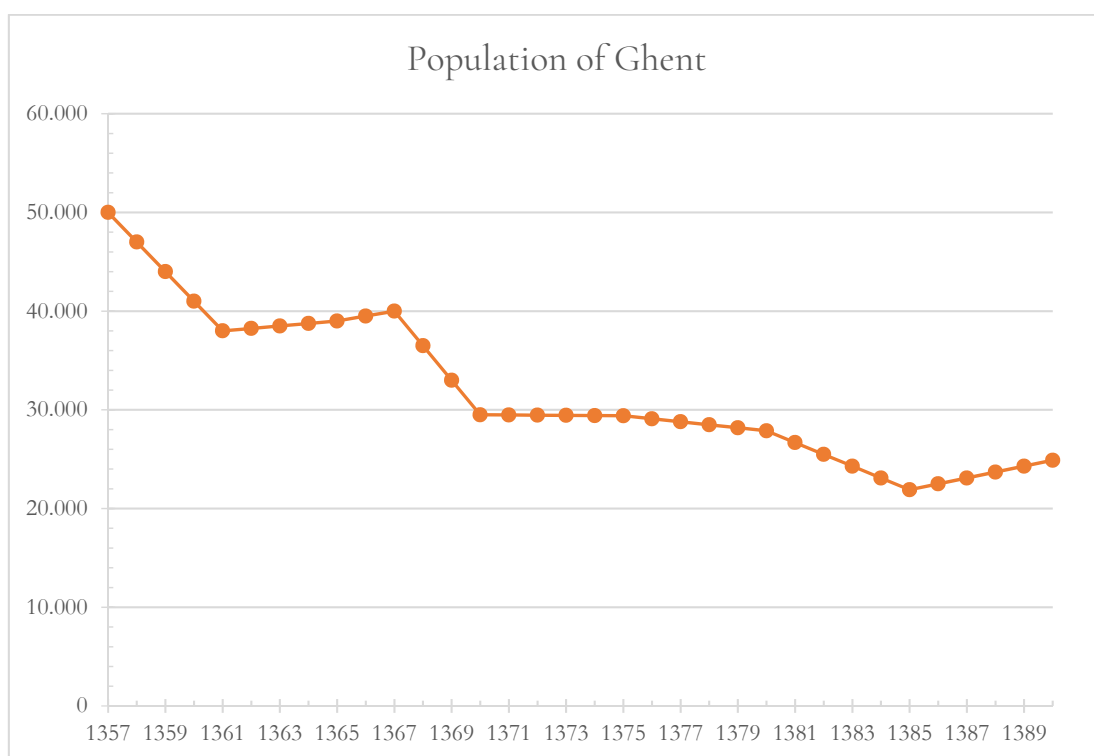


FIGURE 2.20

[Interpolated from D. Nicholas, *Metamorphosis of a Medieval City: Ghent in the Age of the Artevelde*, 1302–1390 (Leiden, 1987), p. 38.]

Similar population trends can be seen in Flanders—the population figures of Ghent in the decades immediately following the Black Death show that the city’s population was suffering from severe decline, though its recovery began from c.1385, Figure 2.20. As in the case of Brabant, the rapid recovery of the population after the Black Death was somewhat undone in the second half of the fifteenth century,³⁰⁴ when some rural depopulation meant that there was a lack of manpower to maintain the flood protection.³⁰⁵

E. E. Rich and C. H. Wilson (eds), *The Cambridge Economic History of Europe, Vol. 4: The Economy of Expanding Europe in the Sixteenth and Seventeenth Centuries* (Cambridge, 1966), p. 19.

³⁰⁴ Blockmans *et al.*, ‘Tussen Crisis en Welvaart’, pp. 44–5; Helleiner, ‘Population of Europe’, p. 18.

³⁰⁵ T. Soens, ‘Flood Security in the Medieval and Early Modern North Sea Area: A Question of Entitlement?’, *Environment and History*, Vol. 19, No. 2 (2013), p. 221.

<i>Date</i>	<i>Brabant</i>	<i>Flanders</i>	<i>Total</i>
1340s	514,223	822,206	1,336,429
1370s	381,213	609,532	990,744
1380s	392,022	626,815	1,018,837
1390s	403,138	644,589	1,047,727
1400s	414,569	662,867	1,077,436
1410s	426,325	681,662	1,107,987
1420s	438,413	700,991	1,139,404
1430s	449,974	719,476	1,169,450
1440s	451,188	721,418	1,172,606
1450s	449,387	718,537	1,167,924
1469-73	413,238	660,738	1,073,976
1490s	374,223	598,356	972,579
1500s	404,635	646,983	1,051,618
1510s	445,202	711,846	1,157,048
1520s	480,448	768,201	1,248,649

FIGURE 2.21

The Populations of Brabant and Flanders

[Derived from Prevenier and Blockmans, *Burgundian Netherlands*, p. 392; Blockmans *et al.*, ‘Tussen Crisis en Welvaart’, pp. 44–5, 49, 52; van der Wee, *Growth of the Antwerp Market*, i, p. 546; the 1340s estimate is based on my own extrapolation, see p. 109.]

Though historians of the Low Countries have not provided estimates for the changing size of the entire populations of Flanders and Brabant, it is beneficial to derive them in order to facilitate more vivid comparison in subsequent chapters. Van der Wee provides year-on-year percentage changes for the Brabantine population, figures which he derived directly from existing hearth tax data for Brabant.³⁰⁶ With estimates for year-on-year population changes, basic mathematical logic suggests that it is possible to derive an entire set of population data for Brabant using just one year’s estimate of the total Brabantine population, provided that this estimate is also derived from hearth tax data. This

³⁰⁶ Van der Wee, *Growth of the Antwerp Market*, i, pp. 545–6. Van der Wee gets his hearth tax data directly from J. Cuvelier, *Les dénombrements de foyers en Brabant (XIVe-XVIe siècle)* (2 vols, Brussels, 1912). The entire collection of available hearth data can be found in Cuvelier’s work. Of course, hearth data may not be *entirely* reliable for discerning changing population levels, namely because they measure households, and might well have been influenced by other factors, like migration. For a discussion of this, see Roosen and Curtis, “The ‘Light Touch’”, p. 5.

single required estimate can be found in the work of Prevenier and Blockmans, who, using hearth tax data, noted that the population of Flanders stood at 660,738 in 1469 and that of Brabant was 413,228 in 1473.³⁰⁷ Therefore, combining van der Wee's year-on-year population change estimates with Prevenier and Blockmans' 1473 population estimate, the total population of Brabant can be derived for analytical purposes. To give a potential impression of the shape of the Brabantine population before the Black Death, I also include the estimate of the pre-plague population provided above.³⁰⁸ The result is shown in the second column of Figure 2.21, where the figures are presented in a decennial format to assist the reader in gaining an overview of the population trends of Brabant. Estimating the Flemish population in the same manner is more difficult because there is not the same amount of hearth tax data for Flanders as there is for Brabant.³⁰⁹ The work of Blockmans *et al.*, and the above discussion of the Ghent population suggest that there was at least *some* common ground between the shape of the Flemish population and that of the Brabantine population in the late medieval period. Therefore, while it can only provide an imperfect and heavily extrapolated insight, it is possible to construct some *crude* estimates of the Flemish population data using the same methodology used for the Brabantine population data. That is to say, I have used the Prevenier and Blockmans estimate for 1469 (which is derived from hearth tax) and I have extrapolated a rough shape of population change using the van der Wee estimates for Brabant. The figures shown in the

³⁰⁷ Derived from Prevenier and Blockmans, *Burgundian Netherlands*, p. 392.

³⁰⁸ See p. 109.

³⁰⁹ This is explained in great depth in J. de Smet, 'Le dénombrement des foyers en Flandre en 1469', *Bulletin de la Commission Royale d'Histoire*, Vol. 99, No. 99 (1935), pp. 105–50.

third column of Figure 2.21 give the results of this calculation, again presented in a decennial format to enable the reader to gain an overview of the changing population shape. While the population estimates for Flanders cannot be treated with the same amount of conviction as for Brabant, on account of the Brabantine figures being derived from 152 years of Brabantine hearth tax data, they provide the only currently viable means of quantitatively setting out the Flemish population.

Figure 2.21 therefore offers an insight into the changing shape of the Brabantine and Flemish populations in the late medieval period. The data shows that while population levels in Flanders and Brabant might well have made significant recovery into the early fifteenth century, this recovery was halted by a decline in population levels in the middle of the century. Recovery then picked up again at the end of the fifteenth century, but my calculations suggest that it is unlikely that the population levels in Flanders and Brabant matched their pre-plague levels until well into the sixteenth century. These findings are consistent with the very recent suggestion of Roosen and Curtis—who examined Hainaut mortmain data—that the road to demographic recovery in the post-Black Death Low Countries was not a straightforward one, and that recurring outbreaks of plague in the fifteenth century would have meant that the population dipped in times of epidemic.³¹⁰ This consistency with the findings of Roosen and Curtis allows for slightly more confidence to be placed in the population estimates. Though these must be treated as little more than the loosest of estimates, they nonetheless enable a new consideration of the

³¹⁰ Roosen and Curtis, “The “Light Touch””, pp. 1–25.

link between the changing size of the Flemish and Brabantine populations and the price, wage and rent data in subsequent chapters.

This section has shown that England's late medieval population trends, in the context of Scotland and the Low Countries, appear to have been unique. Though the Black Death was detrimental to the population levels of all countries, demographic recovery seems to have come much faster for Scotland and the southern Low Countries. In the case of the Low Countries, the absence of unigeniture could well have incentivised earlier marriage and aided population recovery.³¹¹ In England, the population did not begin to recover properly until the second half of the fifteenth century. Again, marriage could have been the culprit—Bailey has suggested that the gender balance was skewed towards women after the Black Death, limiting their marriage options and thus reducing fertility, perhaps more so than was the case in some parts of medieval Europe.³¹² But the opening of the sixteenth century brought clear population recovery for all countries, and England fell into step with her trading partners.

2.4 PER CAPITA MINT OUTPUT

So far this chapter has demonstrated that England's currency was unusually stable and her mint output atypically cyclical, insofar as mint output was dependent on the rare recoinages. After the Black Death, England's population also recovered more slowly than

³¹¹ B. J. P. van Bavel, 'Land, Lease and Agriculture: The Transition of the Rural Economy in the Dutch River Area from the Fourteenth to the Sixteenth Century', *Past and Present*, Vol. 172, No. 1 (2001), p. 40.

³¹² M. Bailey, 'Demographic Decline in Late Medieval England: Some Thoughts on Recent Research', *EconHR*, Vol. 49, No. 1 (1996), p. 17; P. J. P. Goldberg, *Women, Work, and Life Cycle in a Medieval Economy: Women in York and Yorkshire c. 1300–1520* (Oxford, 1992), pp. 333–45.

those of Scotland, Flanders and Brabant. This data will enable subsequent chapters to examine the impact of changing population size and bullion availability on prices, wages and rents. Though the monetary and demographic theories often lead to the independent consideration of mint output and population size, it is worthwhile combining them to create figures for the per capita mint output to add an extra dimension to later analysis. Indeed, in real life, population and money act on the economy together, rather than in isolation. This is true of the medieval period: if England's population remained lower than elsewhere throughout the fifteenth century, demand for money would have been less and thus a lower mint output might have been able to keep the amount of money per capita stable.³³ Using the mint output and population data previously supplied, I now offer some estimates of per capita mint output in England and the Low Countries. The patchy nature of Scotland's mint output and population data do not make it possible to offer per capita mint output estimates for that country, but it can be supposed that, if the available mint data is representative, then gold and silver per capita were in short supply in the fifteenth century. The supply of billon coinage per capita in Scotland was most likely adequate, since James III was able to flood the market in 1482.

Per capita mint output can be derived by dividing the annual output of the mints by the annual population figures. It was seen above that in England, the output of the mints tended to be higher in the fourteenth century than the fifteenth, but output was less consistent in the earlier period. To level out this difference, I have provided the per capita

³³ Though demand for money could still have increased in other ways, such as the switch to cash rents from payment in kind.

mints in decennial totals. Figure 2.22 shows that while there were still more kilograms per capita coming out of the mints in the fourteenth century, the trend appears skewed by two decades of high output—the 1300s and the 1350s. Output was still far more consistent in the fifteenth century and it appears as if there might have been more money per capita than in the fourteenth.

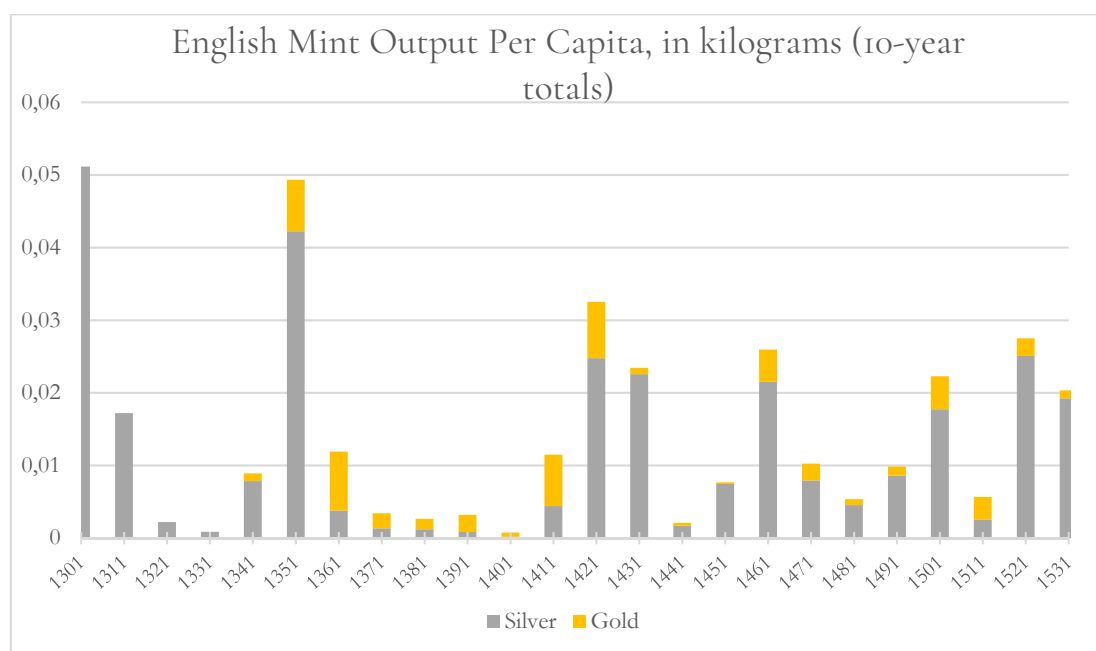


Figure 2.22
[As Figures 2.18 and 2.11]

This conclusion is further solidified by examining the value of the English mint outputs per capita. Figure 2.23 demonstrates that the peaks of the fourteenth century—the 1350s and 1360s—were more than matched by the 1410s, 1420s and 1460s. Interim decades also saw higher values of output in the fifteenth century than in the fourteenth. Of course, the value of output was naturally skewed towards gold but, as has been stressed above, this could have freed up more silver for domestic use because merchants would have preferred to trade with gold.³⁴ Figure 2.24 shows that while the per capita output of silver in

³⁴ Indeed, the mercantile switch to gold should have reduced the losses incurred by the silver coinage resulting from export, further protecting the domestic availability of silver denominations. Even in the case

kilograms was 0.025kg lower in the fifteenth century, the value of the output was £0.083 higher. So, there *was* less silver coming out of the mints, relative to the population, but the rationalisation of the currency at fifty-year intervals seems to have more than offset this decline in silver inflow.³⁵ Given money most probably circulated by tale in England, this should have represented a real increase in the value of the silver output. It is unsurprising that there was more gold in circulation in the fifteenth century, for it was only struck in the second half of the fourteenth century. This certainly throws into question the narrative of England suffering from a money-shortage induced crisis in the fifteenth century.

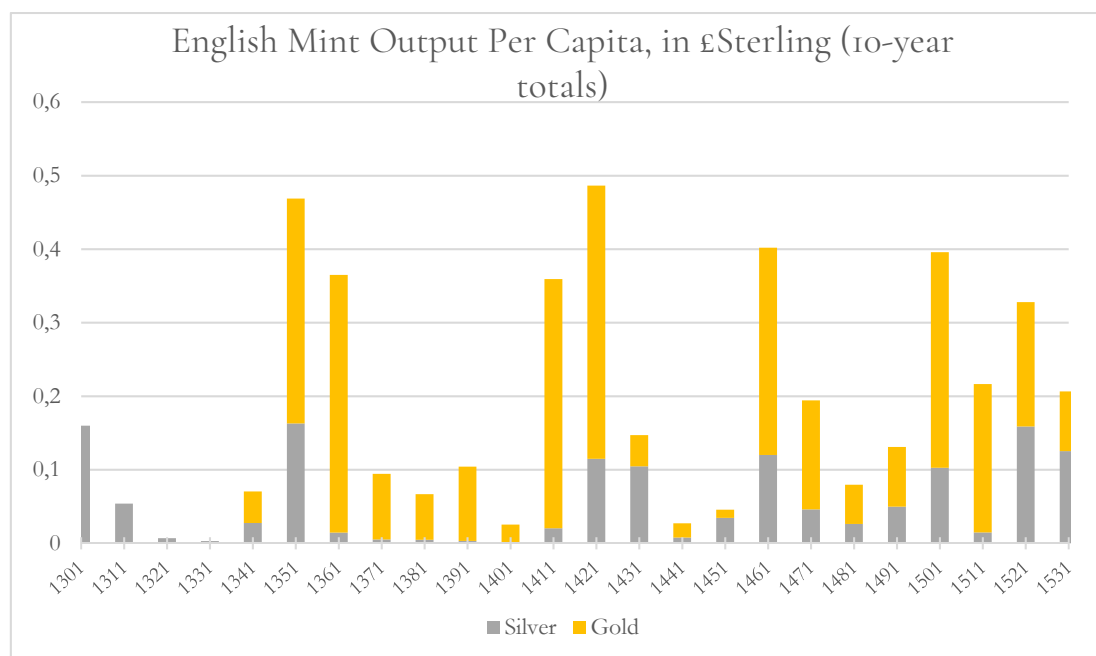


FIGURE 2.23
[As Figures 2.18 and 2.12]

of bimetallic shifts that would have encouraged the export of silver, it is inconceivable that small silver denominations would have been exported because it was relatively more expensive to transport bullion in the form of small change. See below, p. 189 and p. 351.

³⁵ Of course, this method is very rough and presumes that none of the output from the mint was lost abroad. This is not a wildly unreasonable assumption, given the balance of payments always remained positive, but it is an assumption nonetheless. Furthermore, this does not give an indication of the total money stock, just the quantity of the additions to it. It is worth noting that, on account of English currency ‘rationalisations’ happening only every fifty years, the expected lifespan of most coins must have been equal to—or greater—than fifty years.

Century	£Silver per capita	Silver kg per capita	£Gold per capita	Gold kg per capita	£Total per capita	Total kg per capita
1300s	0.442	0.129	0.951	0.022	1.393	0.151
1400s	0.525	0.104	1.373	0.026	1.898	0.130

FIGURE 2.24
Gold and Silver Per Capita in England
[As Figures 2.18, 2.11, and 2.12]

Indeed, the numerous estimates of the annual money stock in England allow for the construction of a per capita money stock. Figure 2.25 confirms the above conclusion by showing that there was far more money per capita after the Black Death. Palma's estimates do show that there was a brief drop in the availability of money c.1410 and c.1450–60, which suggests that there was some existence of a bullion famine and mid fifteenth-century 'slump' in England. However, these declines in the money stock appear exaggerated compared to the high levels of available money in the 1420s and 1430s. In reality, it is unlikely that the English felt a serious decline in the money stock during either of these periods. If England constantly ran a balance of payments surplus, then the money stock only declined through wastage, loss, and wear and tear. Bolton noted that the period between 1452 and 1461 had the lowest positive balance of payments, netting £80,630.³¹⁶ In 1452 Palma estimates that the money stock stood at £1,912,328.³¹⁷ The mints still produced a total of £104,376 in this period,³¹⁸ at least £80,630 of which was foreign coin from trade, and thus expanded the money stock.³¹⁹ Accounting for a compounding loss/wastage of

³¹⁶ Bolton, *Medieval English Economy*, p. 307.

³¹⁷ Palma, 'Money Supply'.

³¹⁸ See Figure 2.12.

³¹⁹ The upshot of a consistently positive balance of payments is that much of the bullion passing through

2%, and assuming that the money stock was only increased by £80,630, then the money stock actually declined by just 1.46% per annum. If wastage and loss amounted to nearer 4% per year, then the balance of payments reduced it to 3.37% per annum. If the middle of the fifteenth century saw a decline in trade, then it is reasonable to assume that wastage was lower, and thus the money stock probably declined by c.1.46% per year. Likewise, the balance of payments offset the decline of money between 1386 and 1399, because the money stock would have increased from £2,335,652 to £2,558,245, if wastage was at 2%. And if wastage was at 4%, the money stock would have declined by just 0.7% per annum. To draw all this together: while it is clear that there was most certainly a decline in the availability of money in the mid fifteenth-century 'slump', trade seems to have helped to offset the loss. It is less clear whether there was actually a severe shortage of money during the bullion famine. The per capita money stock of England also shows that the low points of c.1410 and c.1460 still exceeded the highest pre-plague per capita money stock of the 1320s. Of course, the demand for money might well have increased after the Black Death if the population became accustomed to a greater per capita supply of ready cash. However, we cannot deny that the mid fifteenth-century slump and bullion famine *did not* lower the per capita money stock to unprecedented levels, and that the balance of trade was instrumental in preventing the quantity of money from declining excessively.

The picture of the Flemish and Brabantine per capita mint outputs is rather different.

the English mints must certainly have been foreign coin undergoing recoinage. With infrequent and modest debasements characterising English monetary policy, there was little incentive to bring English coins to the mint, unless they were completely unworn. Indeed, Allen noted that the vast majority of silver purchases at the London Exchange were actually foreign silver. See Allen, *Mints and Money*, p. 264.

Using my estimates of the Flemish and Brabantine populations, Figure 2.26 shows the estimated per capita mint output of the Low Countries mints.³²⁰ It is clear that the debasements in the latter half of the fourteenth century helped to keep the mint outputs high, even as the population began to recover. The impact of the bullion famine manifests itself in the very low output of the 1400s. There was also apparently a shortage of money in the middle of the fifteenth century, as output almost completely dried up in the 1440s and 1450s—just a small amount of gold was struck. The resumption of debasement in the 1460s and 1470s was able to increase the output of the mints to their former levels, but the rising population at the end of the fifteenth century somewhat offset this.

In terms of the value of output, aside from the bullion famine and decline in the mid fifteenth century, the bias towards gold kept the mint output per capita high. The total value of output appears to have been generally higher in the decades of the fifteenth century than the fourteenth, Figure 2.27. It remains evident that there was most certainly a lack of silver currency in the middle of the fifteenth century, which was caused by Philip the Good's promise to leave the currency untouched for two decades following the 1433 monetary unification and reinforcement.

It was seen in the analysis of currency denominations that black money played an important role in the domestic markets of the Low Countries. Figure 2.28 shows that the output of black money per capita generally followed that of the general silver and gold

³²⁰ I have not calculated per capita output for the 1350s and 1360s because it is unclear how any recurring plagues shaped population trends in these decades. Before the 1420s, the per capita mint output uses just the Flemish population and mint data.

output trends.³²¹ The very high output of the 1390s was almost certainly intended to help offset the growing scarcity of silver as the bullion famine took hold and the declining balance of payments following the collapse of the Flemish cloth industry further drained money from Flanders. However, the per capita output of petty coins was lower following the bullion famine, and it remained low until the second half of the fifteenth century. Though it has already been noted that petty coins likely stayed in domestic circulation for longer, and had a greater cumulative effect on the money stock on account of not being reminted, there must surely have been a declining availability of petty coinage by the 1450s. In 1457, the Flemish petty coins were reduced in weight from 218 to 240 to the mark. In 1458 and 1459, a great deal of light mites was issued in Brabant to counteract a shortage in small change.³²² Thus, the quantity of small change appears still to have eroded at an annual output of c.1.5 mites per capita. The demand for petty coins might also have been sufficient to encourage hoarding—it was noted above that an innkeeper hoarded mites to use in his business. Therefore, though petty coins were of low tale value, they might have suffered from a Keynesian ‘liquidity preference’ in the domestic economy. This liquidity preference might have been exacerbated by continued low outputs of c.1.5 mites per capita per year, and further explains why the petty coinage situation in the 1450s appears to have been dire despite continued output.

³²¹ These particular coins are mites, as their value equates to c.1/24 of a penny. Munro, ‘Deflation and the Petty Coinage’, p. 396.

³²² Spufford, *Monetary Problems and Policies*, p. 43.

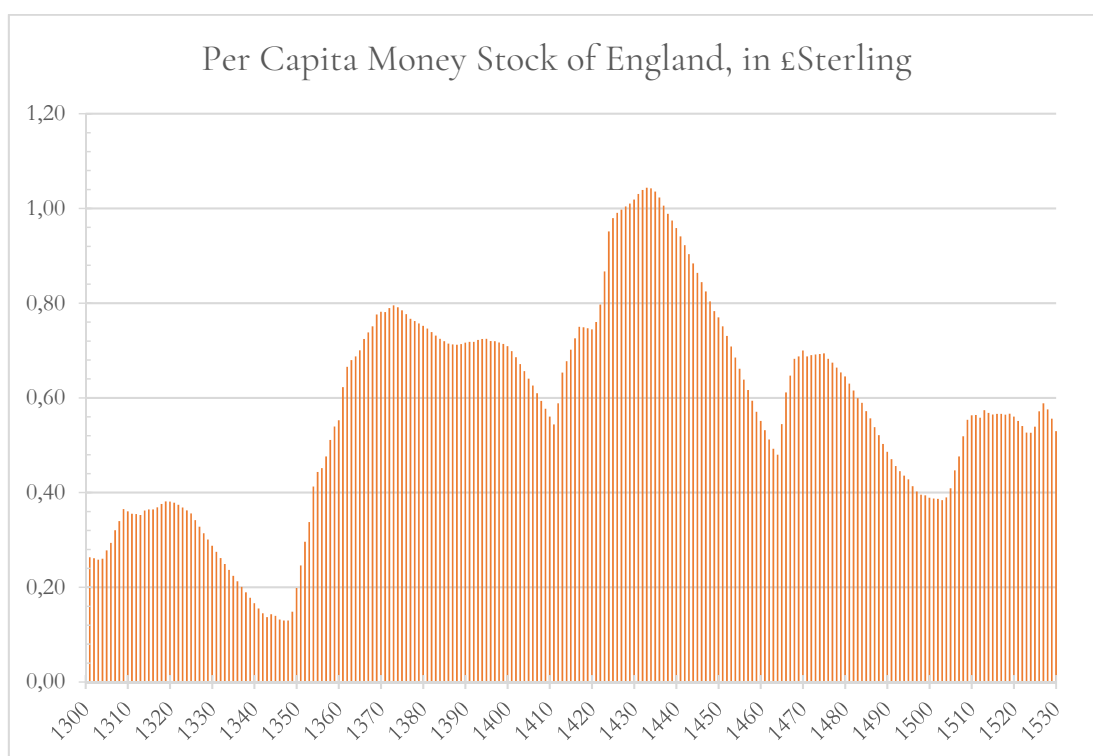


FIGURE 2.25

[Palma, 'Money Supply'; population data derived from population benchmarks given in Broadberry *et al.*, *British Economic Growth*, p. 20.]

It is also possible to draw some conclusions about the difference in per capita money output between England and the Low Countries. Comparing the per capita output in kilograms suggests that there was—on average—about 1.5x more silver per capita coming out of the Flemish and Brabantine mints than the English mints in the late medieval period. Though this suggests that there could have been more bullion per capita about in the Low Countries than in England, it might not have been the case. The constantly struggling balance of payments in the Low Countries is unlikely to have allowed for the bullion stock of the post-Black Death period to accumulate in the same manner that it did in England. The constant trickle of debasements kept output high but the sudden stop in output when debasement ceased suggests that bullion did not naturally flow to the mints

as it did in England. Thus, continual incentive was needed to encourage merchants to bring gold and silver to the mints. Indeed, the fact that Figure 2.9 showed the bimetallic ratio in Flanders and Brabant more readily favoured silver in the late fourteenth century—and in the fifteenth century from 1450 onwards—suggests that the silver output might have appeared high because merchants were bringing silver to the Low Countries mints and saving gold for elsewhere. The minting of black money is a further indication that the Low Countries (and Scotland) needed to provide the domestic economy with small change, but did not have sufficient supplies of silver to keep these petty coins ‘white’. However, while it is possible that the per capita availability of bullion decreased in the Low Countries and Scotland in the fifteenth century, the use of black money and heavily debased coins might have stabilised the overall supply of money throughout most of the post-Black Death period.

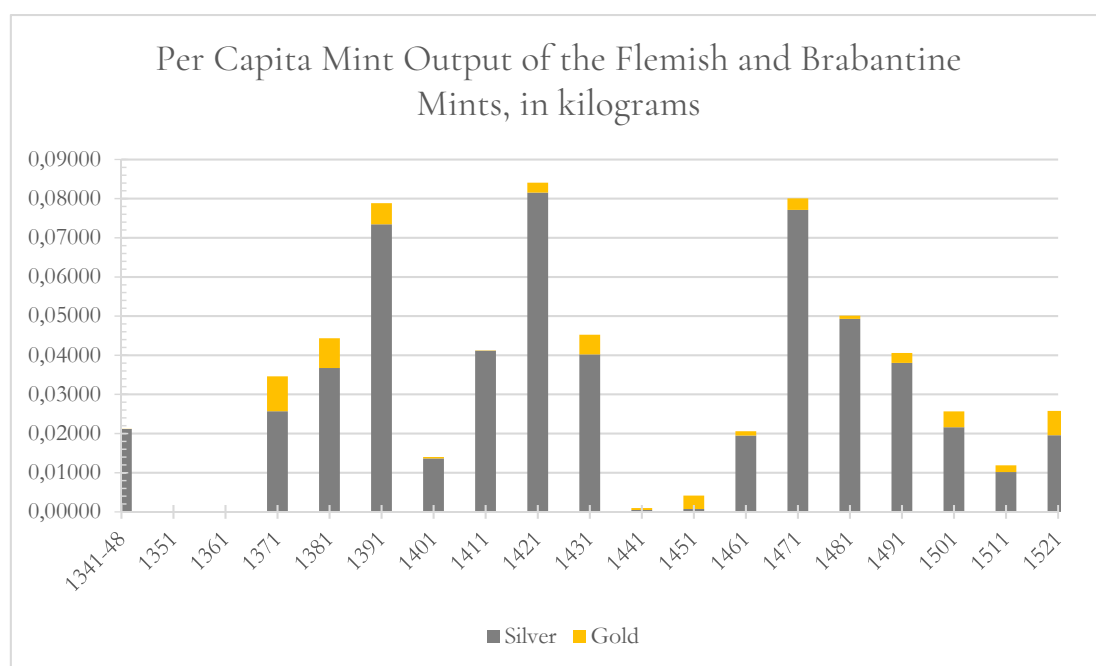


FIGURE 2.26
[As Figures 2.15 and 2.21]

This situation in the Low Countries forms a stark contrast to the impression gained of England. While it was possible for the Low Countries to maintain a stable per capita supply of money, this came at the expense of continual debasement. In England, it appears that it was possible to maintain a fairly stable per capita money supply in the post-Black Death period without resorting to frequent or aggressive debasement. This was because England's balance of trade always remained positive, which ensured a steady supply of bullion to the mints. Furthermore, the population remained low enough to offset most of the decline in trade during the fifteenth century. Consequently, England found itself in a uniquely favourable position where the availability of money was concerned.

2.5 CONCLUSION

This chapter has demonstrated that the money of England was unusually strong and stable throughout the post-Black Death period. In contrast, Scotland, Flanders and Brabant had to debase their currencies frequently on account of constant bullion outflow resulting from a balance of payments deficit. England alone was able to resist debasement and the issuing of black money because the balance of payments always remained positive, even in the bullion famine and mid fifteenth-century 'slump' periods. Indeed, the cyclical nature of her mint output further highlights that England's monetary policy was centred around rationalising the new coins with the worn old coins in circulation. Mint outputs in interim years were surely just reminting foreign coin that had entered the country through trade—in fact, a good deal of this money must have been initially produced by the Scottish, Flemish and Brabantine mints! Consequently, it is likely that the relationship between mint output and the English money stock was more cumulative than it was

elsewhere. The English population also recovered more slowly than the others after the Black Death—in Scotland and the Low Countries, population recovery was well under way by the end of the fourteenth century. Combined with the positive balance of payments, this further reduced England’s pressure to debase.

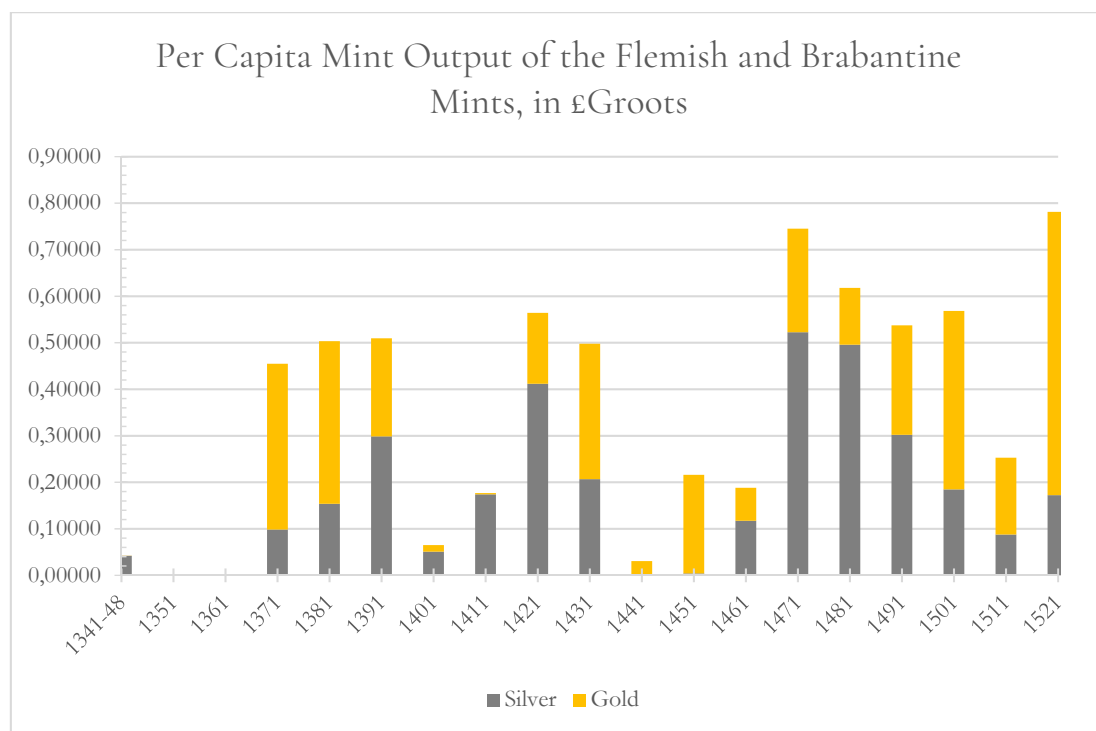


FIGURE 2.27
[As Figures 2.16 and 2.21]

It is evident, however, that there was an increasing bias towards gold in fifteenth-century England, on account of the English mints undervaluing silver compared with the mint prices elsewhere. Consequently, even though the total money stock per capita has suggested that there was clearly more money about after the Black Death than there was before, it is possible that there was still a shortage of silver for small domestic transactions—we cannot be entirely certain to what extent gold was able to liberate silver for use at the lower end of the economy. In Scotland, it was evident that there was a general

shortage of money from the late fourteenth century onwards, as demonstrated by the frequent and aggressive debasements, and the issuance of black money. Though the per capita mint output of Flanders and Brabant has indicated that there might have been more bullion per head than there was in England, to what extent this was the case is unclear because the Low Countries almost certainly ran a balance of payments deficit. It is therefore clear that England's monetary and demographic trends in the post-Black Death period were unique among her trading partners. The rest of this thesis examines the impact of such a unique economic backdrop. By having such a stable currency, it is possible that this will translate into an almost 'neutral' effect on the economy, allowing other factors—such as population change—to have a greater impact on prices, wages and rents than might otherwise have been possible for Scotland and the southern Low Countries. If this proves to be the case, it would certainly support Postan's argument for the neutrality of money on the English economy.

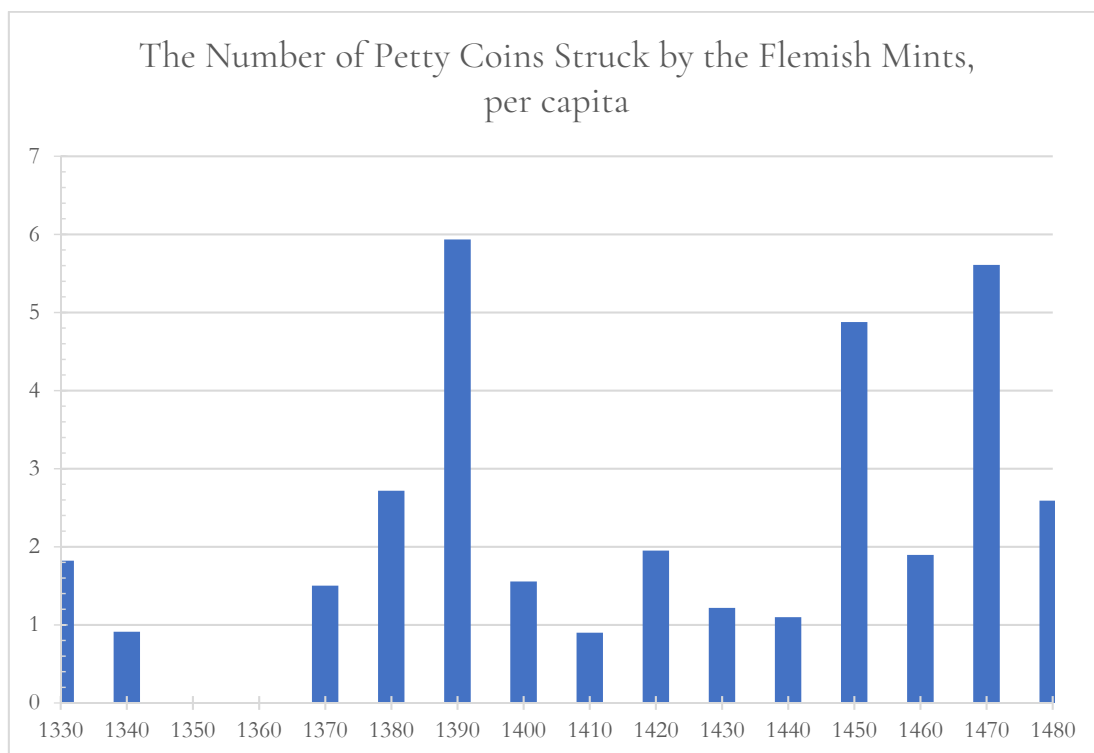


FIGURE 2.28

[Derived from Munro, 'Deflation and the Petty Coinage', p. 396; Prevenier and Blockmans, *Burgundian Netherlands*, p. 392; Blockmans *et al.*, 'Tussen Crisis en Welvaart', pp. 44–5, 49, 52.]

CHAPTER 3: COMMODITY PRICES

Chapter 2 has shown that England's population was apparently remarkably slow to recover after the Black Death; the intrinsic weight of its currency was unusually stable; and the cyclical nature of the mint output was unique among her trading partners. But to what extent do England's commodity price trends differ from those of Scotland, Flanders and Brabant? As discussed in Chapter 1, there is an ongoing debate in the study of the late medieval English economy as to whether long-term price trends were driven by changes in the size of the population, or by changes in the size of the money stock. The impact of population on the general price level has tended not to be quantified, presumably because of difficulties with the estimates of the population size. In contrast, there have been a number of attempts to measure the quantitative impact of changes in the quality and quantity of money produced by the mints.³²³ Most notable is that of Munro, whose work has tended to utilise statistical testing—such as regression analysis—to discern the long-term impact of these monetary factors on the general price level.³²⁴ This chapter builds on Munro's work in a number of ways. My regression models consider not only debasement and mint output for England, Flanders and Brabant, but also incorporate Scotland, using the data set out in Chapter 2. Like Munro, I have been forced to use mint output as an imperfect proxy for the size of the money stock, for there have been

³²³ See for example Mayhew, 'Quantity Theory of Money in Historical Perspective', pp. 62–96; Munro, 'Mint Outputs, Money, and Prices'; Campbell, *Great Transition*, pp. 367–9; Palma, 'Money Supply'.

³²⁴ See Munro, 'Mint Outputs, Money, and Prices', pp. 31–122.

no attempts to construct regular money stock estimates for Scotland, Flanders and Brabant.³²⁵ I also include the population data for England, Brabant and Flanders in the regression model, which serves to make this chapter a uniquely comprehensive study of the impact of population, debasement and mint output on commodity price trends.

In this chapter, the overall trends are set out by presenting graphs of the nominal prices of each commodity, with a short description of general trends. I do not offer graphs of prices expressed in grains of silver, because I accept Desan's argument for English nominalism and thus the primacy of nominal prices.³²⁶ To gain an overall impression of the impact of demographic and monetary factors on the *general* price level, this chapter ends by discussing the baskets of consumables for England, Flanders and Brabant. It also offers some estimates for a Scottish basket of consumables. Regression analysis confirms the conclusions gained from the analysis of individual commodity price trends.

To preserve the sanity of the reader, this chapter avoids repetition of a standard model for each commodity. Instead, to simplify a great deal of complex data, after the

³²⁵ As discussed in Chapter 2, mint output can only ever serve as a general indication of the changing availability of money because it cannot tell us to what extent its relationship with the money stock was cumulative. Challis has suggested that money stayed in circulation for about thirty years, yet there is also hoard evidence to suggest that the longevity of gold coins was far greater. See C. E. Challis, *The Tudor Coinage* (Manchester, 1978), p. 247; and for evidence of the longevity of gold coins in the late fifteenth century, see Ball, 'Royal Wealth'. Coin could also be lost through a negative balance of payments, an issue which was particularly pertinent to Scotland, Flanders and Brabant (see p. 46). It is thus with caution that we draw conclusions about the fluctuation of *M* by examining mint output data. Nevertheless, until there are money stock estimates for Scotland, Flanders and Brabant, this is the only way to test the validity of the monetary theory.

³²⁶ Desan, *Making Money*, pp. 125–38. Nominal prices are the prices as they were quoted to customers, i.e. 1d. for a loaf of bread. This is in contrast to silver prices, where the equivalent in grains of silver is used to quote the price. However, silver prices are more commonly used by economic historians rather than contemporaries and are thus an unrealistic representation of value.

overview of price trends, the rest of this chapter analyses the price data thematically, addressing in turn the different factors most likely to have influenced prices. It first looks at where the price trends can be explained by changes in the population level, which could have manifested themselves as fluctuations in the supply and demand balance. It then looks at the extent to which debasement and fluctuations in the mint output can explain general price trends. The impact of the environment and fluctuations in crop yields are then discussed. When all these factors are used as part of regression analysis, we are testing the impact of these independent variables on *long-term* price trends.³²⁷ Thus, we cannot expect demographic, monetary or environmental factors to explain all price movements. With this in mind, the next section looks at the impact of politics, trade and conflict, taking a more short-term approach. Finally, it is conceded that there are some price fluctuations that cannot easily be explained.

3.1 THE TRENDS OF COMMODITY PRICES

This section outlines the general trends of each commodity by presenting a graph of the nominal prices and offering a brief commentary. To facilitate straightforward comparison of all commodity prices in different countries, I have presented the data as indices.³²⁸ This is shown by giving the base period in the title, e.g. '(1491–1500=100)'. Using indices provides a better way of making the data comparable than expressing prices in grains of silver because the latter hides the impact of debasement, which is counterproductive

³²⁷ In the case of crop yields, regression analysis tests whether there was a consistent long-term reaction to short-term supply shocks.

³²⁸ Indices are calculated by dividing each year's (or decade's) price by the base period's price and multiplying by 100.

since it is one of the factors with which this thesis is most concerned. At this point, no explanation of the price trends will be offered—that will come later in Section 3.2 and beyond.

Barley's use as a vital grain for brewing drinks meant that it was an essential commodity for everyday living throughout medieval Europe—and therefore the best one to start the analysis.³²⁹ Figure 3.1 shows the trends of nominal barley prices. In England, barley prices rose up to the 1360s, then fell dramatically until the 1380s. They then rose slightly again around the turn of the fourteenth century; thereafter they declined for most of the fifteenth century, broken only by two peaks of inflation in the 1430s and 1480s. Price depression appears to have been slightly more dramatic in the 1440s, though recovery was under way by the 1450s. Barley prices then rose into the sixteenth century. In Flanders and Brabant, however, the trends are rather different. Price inflation still occurred at the beginning of the series and endured until the 1370s, but the subsequent general trend is one of inflation punctuated with periods of deflation. These deflationary periods are especially prominent around the end of the fourteenth century and in the middle of the fifteenth. As in England, there is clear inflation in the 1430s and 1480s, and though the series ends for Flanders at the end of the fifteenth century, the Brabant data shows that there was still the same inflation in the early sixteenth century as was present in England. In Scotland, the barley price data shows even more consistent inflation. Though prices appear to have remained flat in the fourteenth century, they generally rose

³²⁹ Gemmill and Mayhew, *Changing Values*, p. 180; Campbell, *English Seigniorial Agriculture*, pp. 243–5.

throughout the fifteenth. There were again peaks in the 1430s and 1480s. Like Flanders and Brabant, there also appears to have been a slightly deflationary period in the middle of the fifteenth century, which began in the 1440s and lasted until recovery started in the 1460s. Scottish barley prices were also inflationary in the sixteenth century, though the inflation appears to have peaked in the 1510s; thereafter it seems to have plateaued.

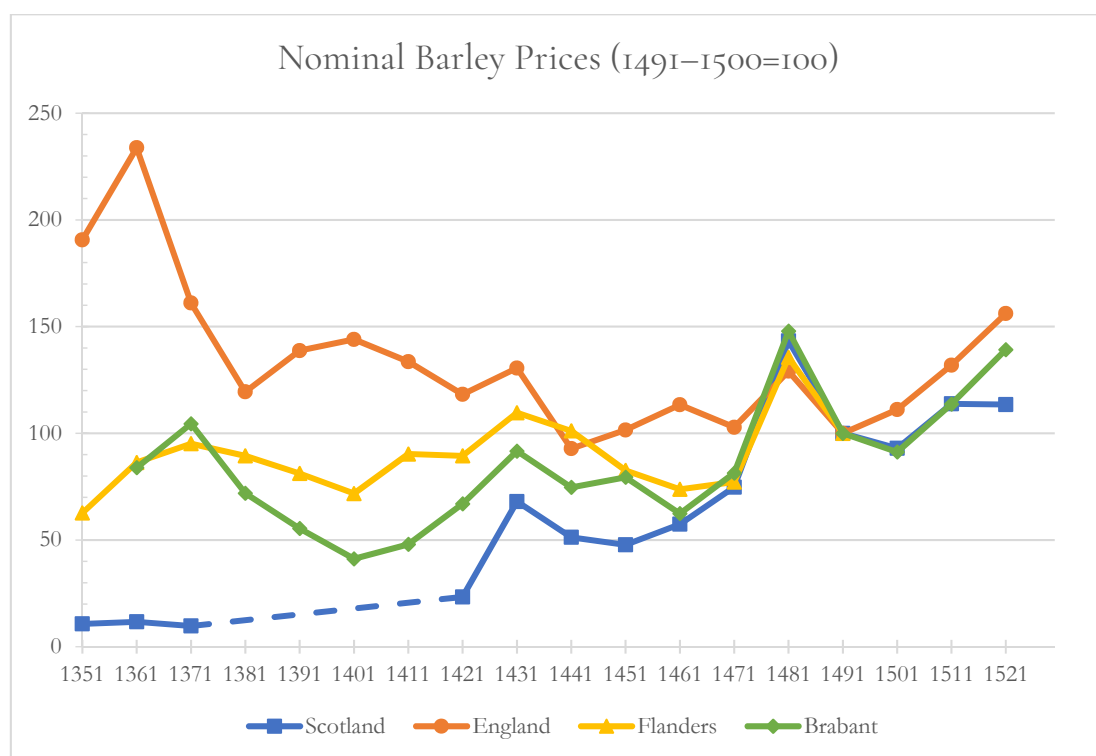


FIGURE 3.1

[Gemmill and Mayhew, *Changing Values*, pp. 166–77; Clark, ‘Price History’, pp. 41–123; van der Wee, *Growth of the Antwerp Market*, i, pp. 189–93; Munro, ‘English Prices and Wages Data’ (29 June 2018); Munro, ‘Flemish Prices and Wages Data’ (29 June 2018); Munro, ‘Brabantine Prices and Wages Data’ (29 June 2018).]

Figure 3.2 shows that the nominal prices of wheat in England were slightly different from barley prices: the general trend of English wheat prices appears to have been one of stagnation rather than deflation. Like barley prices, wheat price inflation was present in

England until the 1360s, followed by a period of deflation until the 1380s. The same inflation around the end of the fourteenth century is still present. Likewise, there was a period of high prices in the 1430s, yet this was followed by deflation in the 1440s which appears to have been more dramatic for wheat than barley. Prices then rose for most of the remainder of the fifteenth century, with inflation particularly noticeable in the 1480s. The sixteenth-century inflation appears to have been more dramatic for wheat than for barley.

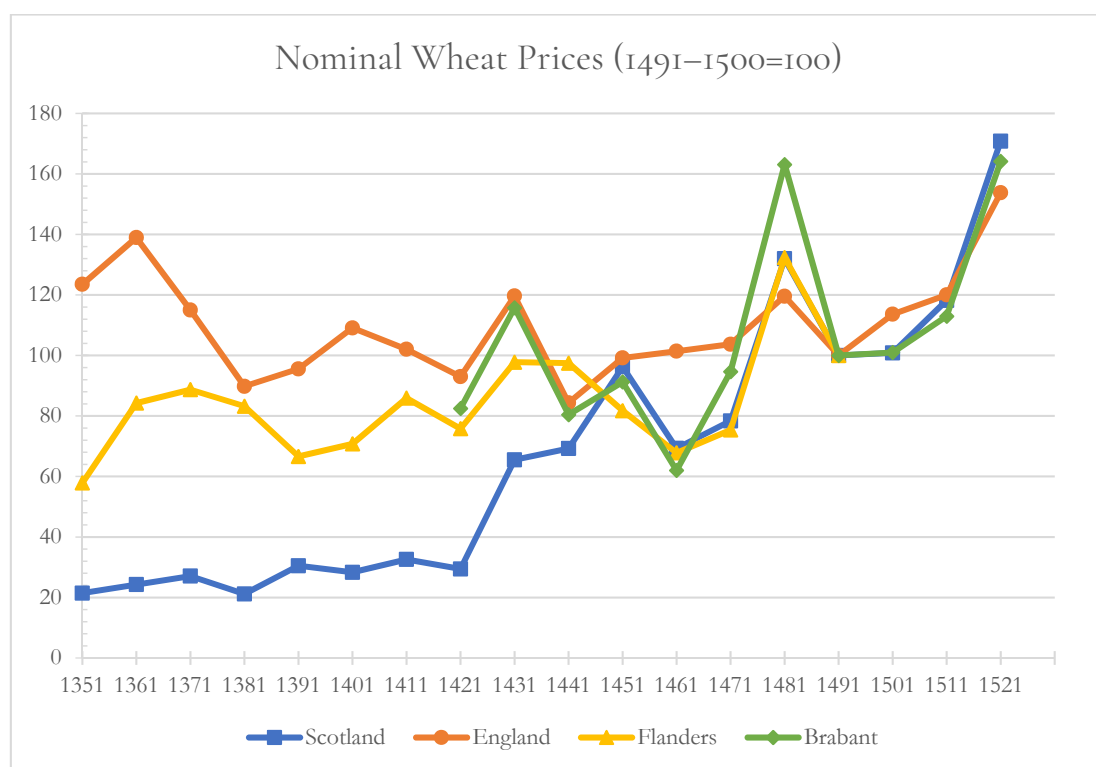


FIGURE 3.2

[Gemmill and Mayhew, *Changing Values*, pp. 151–61; Clark, ‘Price History’, pp. 35–105; van der Wee, *Growth of the Antwerp Market*, i, pp. 183–8; Munro, ‘English Prices and Wages Data’ (29 June 2018); Munro, ‘Flemish Prices and Wages Data’ (29 June 2018); Munro, ‘Brabantine Prices and Wages Data’ (29 June 2018).]

In Flanders and Brabant, wheat prices also appear different from barley; the wheat

prices seem far more volatile. There was still inflation up to the 1370s, followed by deflation around the end of the fourteenth century. There is inflation in the 1410s which is more pronounced than it was for barley. Likewise, the price inflation of the 1430s and 1480s is also more dramatic for wheat prices. There is still deflation in the middle of the fifteenth century, and this too appears more pronounced. After prices levelled out in the 1490s and 1500s, Brabantine wheat prices display dramatic inflation in the early sixteenth century. In Scotland, like barley prices, wheat prices are also fairly flat in the second half of the fourteenth century—and the greater availability of price data shows that serious price inflation did not begin until the 1430s. Prices continued to rise after that point, with particularly high peaks in the 1450s and 1480s. There was again a period of lower prices in the middle of the fifteenth century. Like barley prices, wheat prices levelled out at the end of the fifteenth century, but the price inflation that followed in the early sixteenth century appears far more dramatic for wheat.

Figure 3.3 shows that oat prices in England were fairly deflationary, as was the case for barley prices. They were also far less volatile than wheat prices. Instead of the characteristic inflation that persisted until the 1360s, oat prices remained flat in the 1350s and 1360s, before falling thereafter. Again, there was a slight rise in prices around the end of the fourteenth century, followed by a gentle decline in prices. This deflation endured for most of the fifteenth century, with a particularly noticeable period of deflation in the 1440s. Prices only began to rise from the 1490s onwards, and this inflation was far less pronounced than it had been for barley and wheat. Interestingly, the peak inflationary decades—the 1430s and 1480s—do not show the same inflation for England.

In Flanders and Brabant, nominal oat prices show much the same trends as have been seen in the nominal barley prices. There was the same rise in prices to the 1370s, followed by the decline, and then the inflation in the early fifteenth century. This inflation was broken by a period of deflation in the middle of the fifteenth century. Periods of inflation were present in the 1430s and 1480s, though the price inflation of the early sixteenth century was less dramatic than it was for wheat prices. In Scotland, the data is patchy for the fourteenth century, but it appears that there was little inflation until the 1440s. Oat prices were particularly low in the 1430s—a marked contrast to the inflation seen in barley and wheat prices. The inflation of the 1480s remains present, and appears more dramatic for oats than it did for barley and wheat. After the price stagnation at the end of the fifteenth century, Scottish oat prices endured the characteristic inflation of the early sixteenth century, though this was more pronounced than it was for barley prices, and less than it was for wheat prices.

Figure 3.4 shows the trends of nominal cow prices in England and Scotland—unfortunately there is no data for Flanders or Brabant. Like barley and oat prices, the trend of nominal cow prices in England is deflationary. There was little inflation from the 1350s to the 1360s, and the volatility of cow prices appears to have been very low. There was no pronounced inflation in the 1430s or 1480s, and there was also no dramatic deflation in the 1440s. Prices appear to have risen slightly towards the end of the fifteenth century, though the series ends in the 1490s, meaning that we cannot ascertain whether there was still price inflation in the early sixteenth century. In Scotland, the data is again patchy for the fourteenth century and, though there does not appear to have been rampant price

inflation during this period, it still appears to be the case that cow prices increased by 50% between the 1360s and 1390s. Rampant inflation did characterise the overall trend of cow prices in the fifteenth century, though dramatic inflation in the 1450s broke the trend. Absent data makes it unclear whether there was price inflation in the 1430s, but there does appear to have been inflation in the 1480s. This was followed by deflation in the 1500s, but the commonplace inflation of the sixteenth century again endured thereafter.

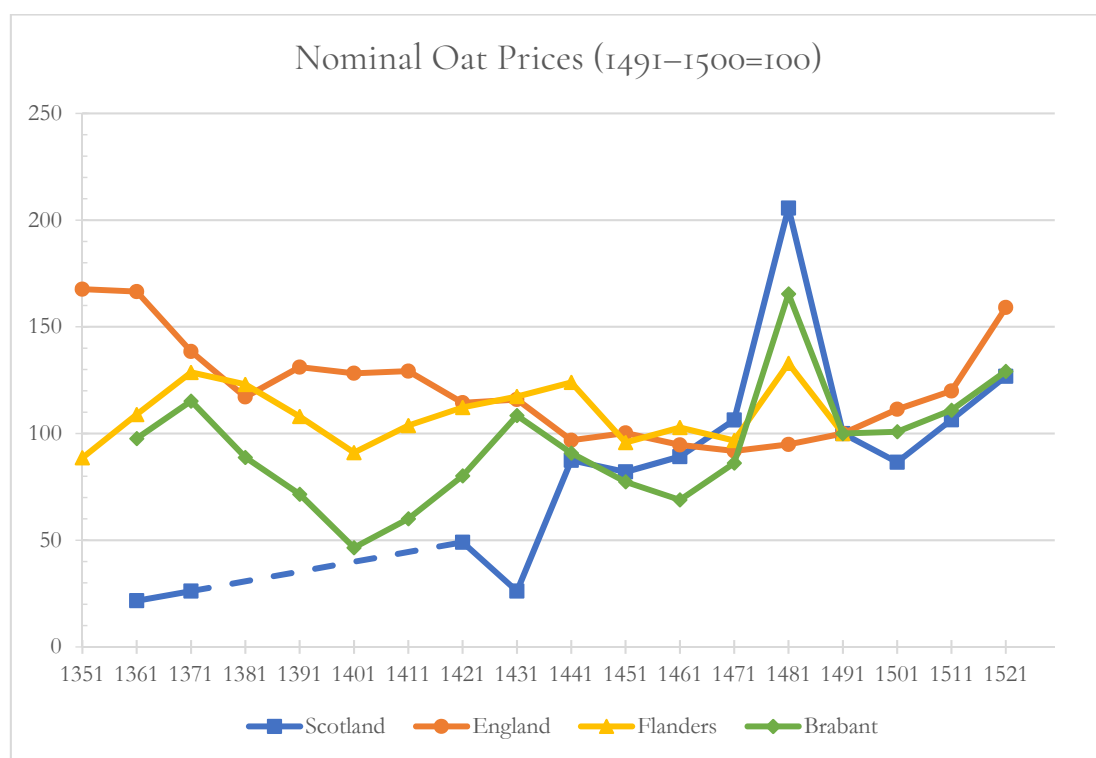


FIGURE 3.3

[Gemmill and Mayhew, *Changing Values*, pp. 192–201; Clark, ‘Price History’, pp. 35–105; van der Wee, *Growth of the Antwerp Market*, i, pp. 194–8; Munro, ‘English Prices and Wages Data’ (29 June 2018); Munro, ‘Flemish Prices and Wages Data’ (29 June 2018); Munro, ‘Brabantine Prices and Wages Data’ (29 June 2018).]

Figure 3.5 shows the trends of nominal herring prices. For English herring prices, there are a number of differences from the other commodity prices seen so far. The bout

of inflation from the 1350s to the 1370s that was seen with many other commodities has been replaced by deflation. This deflation is followed by the same inflation which occurred around the end of the fourteenth century. Thereafter, prices largely remained flat, experiencing a slight fall in the 1430s (in contrast to the inflation incurred by many other commodities in this decade). Prices rose in the 1460s, but then fell and continued a slow decline for the remainder of the fifteenth century, and into the sixteenth century.

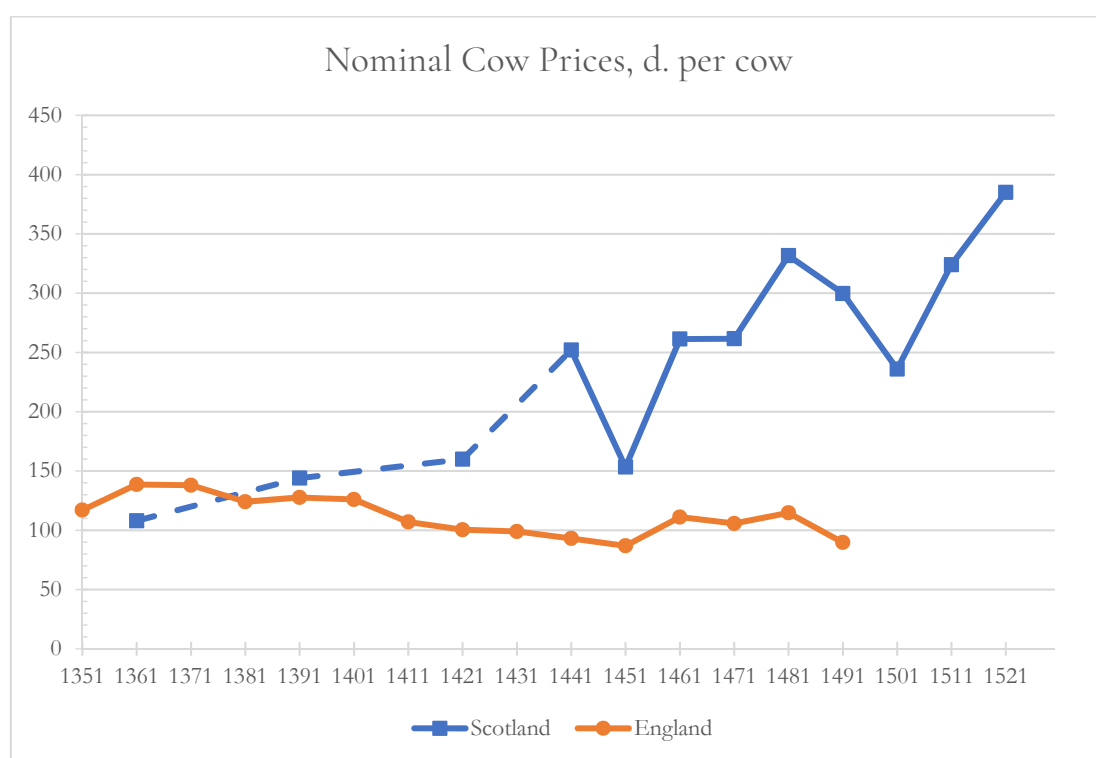


FIGURE 3.4

[Farmer, 'Prices and Wages', pp. 508–12; Gemmill and Mayhew, *Changing Values*, pp. 252–5.]

This forms a strong contrast to the price inflation seen in the price trends of barley, wheat and oats. In Brabant, after the brief deflation in the 1400s, herring prices were fairly inflationary throughout the fifteenth century. There was no pronounced rise in

prices in the 1430s, but the 1480s did see dramatically higher prices. After the price stability of the 1490s and 1500s, herring prices increased in the early decades of the sixteenth century. In Scotland, the patchiness of the data makes it more difficult to discern a clear trend in nominal herring prices. It does appear that herring prices inflated more readily in the late fourteenth and early fifteenth centuries than other commodity prices. Herring prices appear extremely low in the 1500s, and there was no price inflation in the early sixteenth century.

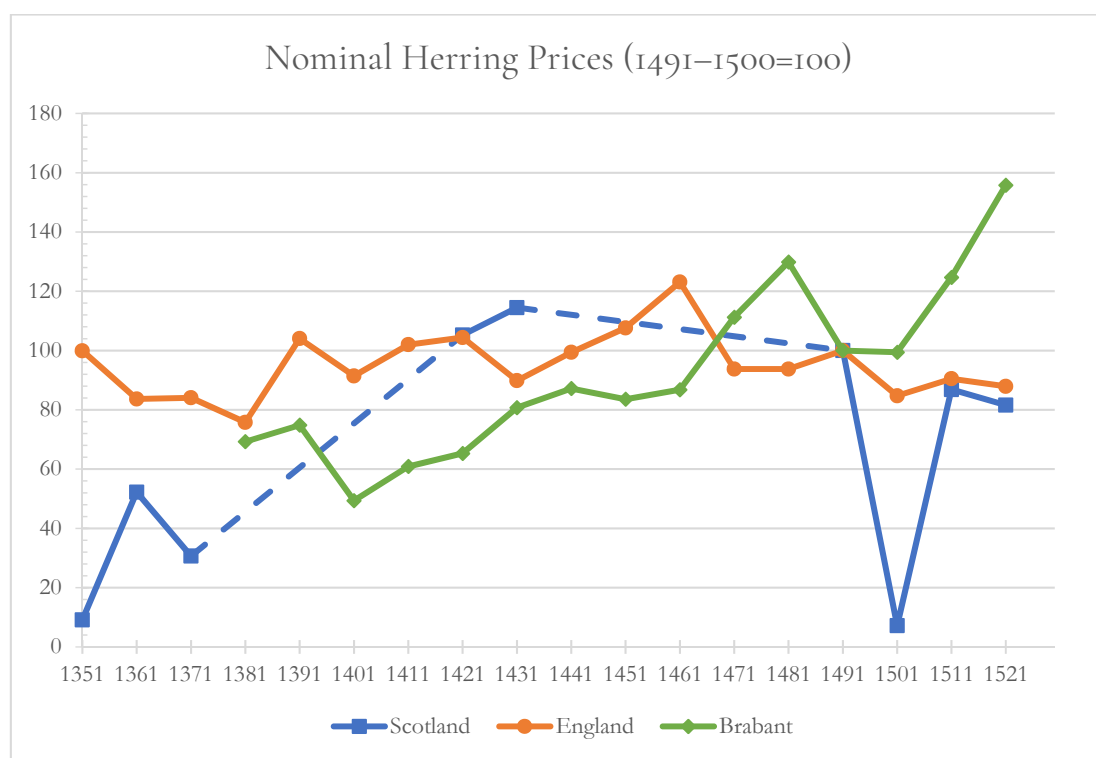


FIGURE 3.5

[Gemmill and Mayhew, *Changing Values*, pp. 321–4; Clark, ‘Price History’, pp. 35–105; van der Wee, *Growth of the Antwerp Market*, i, pp. 277–86.]

The trends of nominal salmon prices can be seen in Figure 3.6. In England, salmon prices were high in the 1420s, but suffered from deflation in the middle of the fifteenth century, with the worst decade being the 1440s. As was the case with herring prices, there

was no dramatic inflation in the 1430s, but there is clear inflation in the 1480s. Prices again stabilised in the 1490s and 1500s, before gradually rising into the sixteenth century. In Scotland, salmon prices appear to have been more clearly inflationary than herring prices, though the trends of the fourteenth century are again obscured by a lack of data. Salmon prices were slightly higher in the 1430s and 1480s. They suffered from deflation in the 1450s, though this period of price depression had less longevity than other commodities and lasted for just one decade. Prices were again depressed in the 1490s and 1500s, and then rose into the sixteenth century.

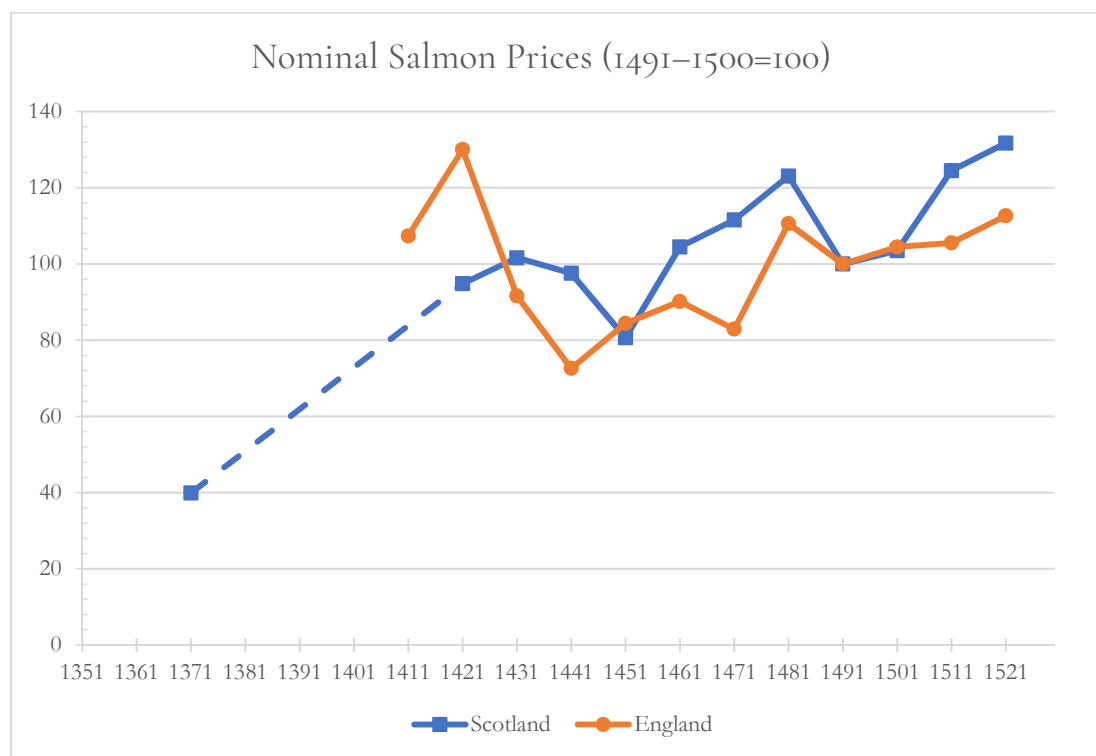


FIGURE 3.6

[Gemmill and Mayhew, *Changing Values*, pp. 311-19; Clark, 'Price History', pp. 35-105.]

Figure 3.7 shows the trends of nominal cheese prices. In England, after the initial deflation of the 1350s and 1360s, cheese prices were mostly flat for the remainder of the

fourteenth century. They remained so until a minor period of price inflation in the 1430s, before declining in the 1440s. This lower price level was mostly maintained until the inflation of the 1480s. Prices then levelled out in the 1490s and 1500s, before rising dramatically in the 1510s. Nominal cheese prices then fell in England in the 1520s, though they still maintained a level far higher than any prices seen in the fourteenth and fifteenth century. Nominal cheese prices in Flanders show far more pronounced inflation in the second half of the fourteenth century compared with what has been seen in other commodities so far. The inflation increased consistently from the 1350s to the 1380s, which is a marked difference from other commodity prices, where inflation normally persisted only until the 1370s. Thereafter, cheese prices fell heavily until the 1400s. This same trend appears to have been repeated in Brabant, though the absence of price data before the 1380s prevents confirmation of this observation. Nominal cheese prices in both Flanders and Brabant rose from the 1400s to the 1430s; thereafter they suffered from depression until the 1460s. Cheese prices then rose, peaking in the 1480s—a decade of extremely high inflation. The price stability of the 1490s and 1500s apparent in other commodities is again repeated, as is the inflation that followed in the early sixteenth century. Data for Scottish cheese prices is lacking before the 1430s, but the general trend seems to fall in line with other commodities. There was deflation around the middle of the fifteenth century, then gradual inflation as the fifteenth century came to a close. Notably, there was no dramatic inflation in the 1480s and, relative to the 1470s, cheese prices actually fell slightly in this decade.

Constructing a comparison of salt prices first requires a brief discussion of the different price series available for Brabant. The most salt data is for Malines, in Brabant. Data also exists for Lier, but the prices were identical, so Lier has been excluded. There are two salt datasets for Malines: Zeeland salt and French-Iberian salt, Figure 3.8. Both of these have been plotted in Brabant *groots* per Lier salt barrel to give a direct price comparison.³³⁰ Prices of Zeeland salt were extremely flat until 1421, when the flood of St Elisabeth effectively caused the Zeeland salt industry to grind to a halt.

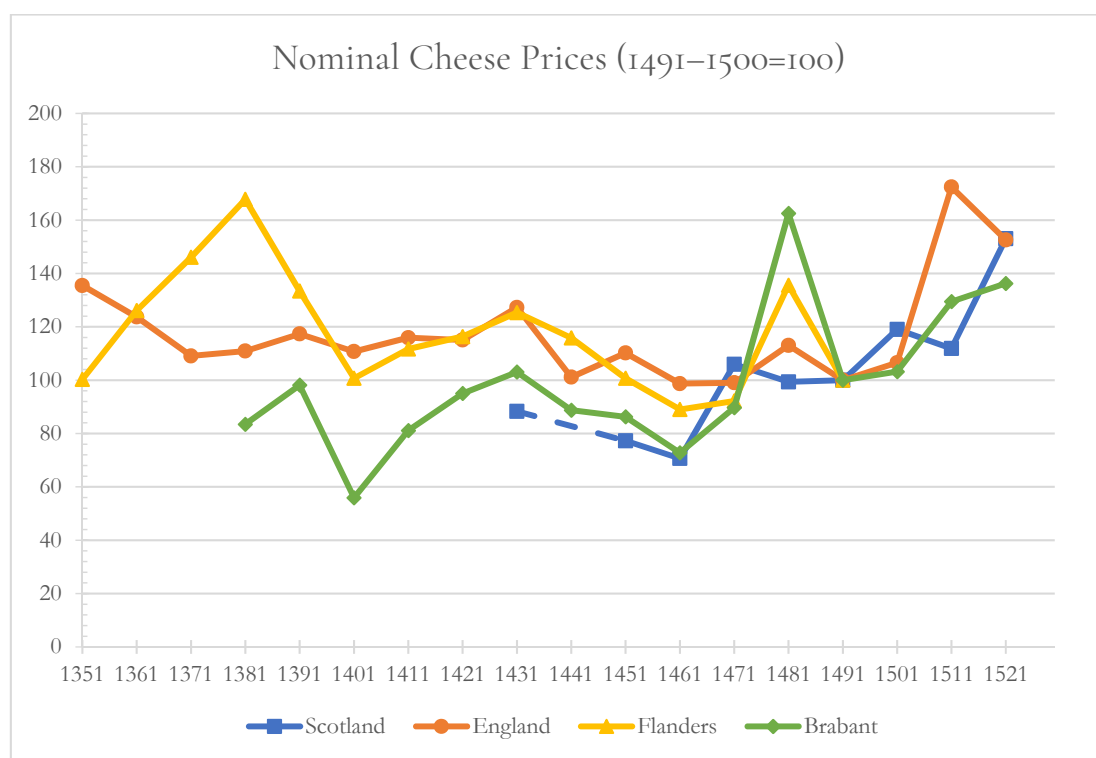


FIGURE 3.7

[Gemmill and Mayhew, *Changing Values*, pp. 293–4; Clark, ‘Price History’, pp. 35–105; van der Wee, *Growth of the Antwerp Market*, i, pp. 217–24; Munro, ‘English Prices and Wages Data’ (29 June 2018); Munro, ‘Flemish Prices and Wages Data’ (29 June 2018); Munro, ‘Brabantine Prices and Wages Data’ (29 June 2018).]

³³⁰ Note that a ‘Lier salt barrel’ is a unit of measurement rather than a description of the salt’s origin.

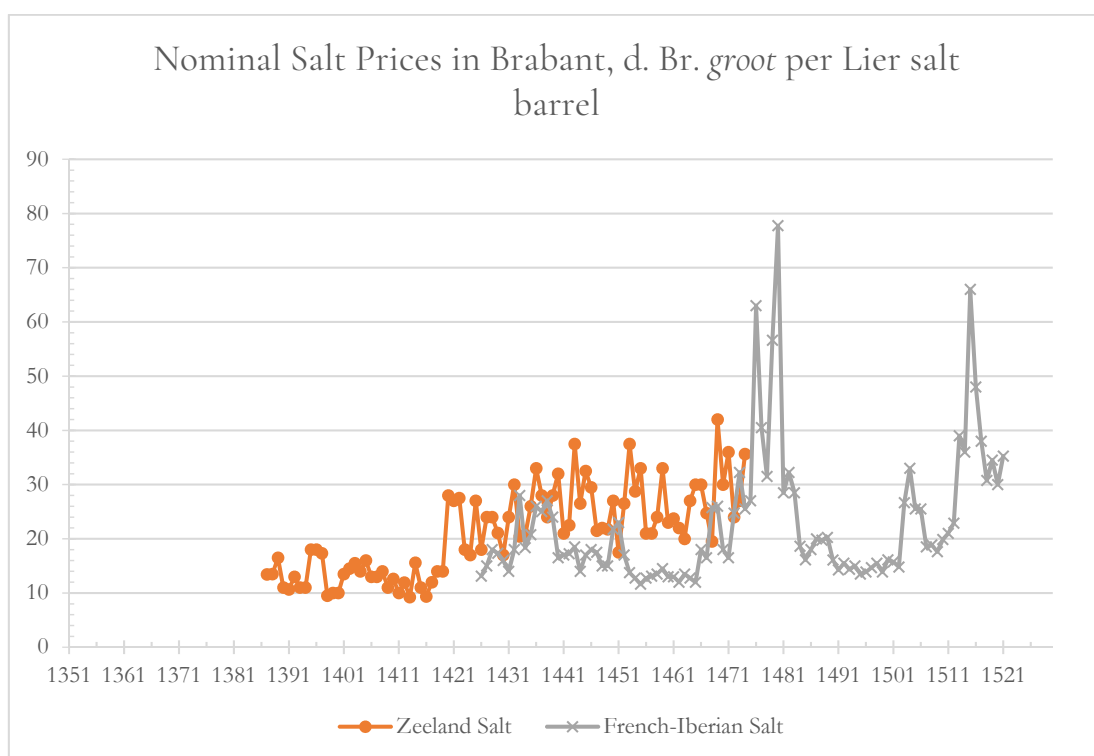


FIGURE 3.8
[van der Wee, *Growth of the Antwerp Market*, i, pp. 287–93.]

The quantity of salt produced by Zeeland had already been inadequate for the needs of much of the Low Countries, and this supply deficit exacerbated the issue and drove prices up.³³¹ Then followed a swap to French salt, which remained much cheaper than Zeeland salt for the rest of the period. The cheaper French salt was able to effectively destroy the Zeeland salt industry: in 1407–8 Biervliet had produced 7 million litres of salt, but this had fallen to just 1.6 million by the middle of the fifteenth century.³³² Zeeland salt prices could not fall to compete with French salt prices because there was not enough

³³¹ P. Spufford, 'Debasement of the Coinage and Its Effects on Exchange Rates and the Economy: In England in the 1540s, and in the Burgundian-Habsburg Netherlands in the 1480s', in J. H. Munro (ed.) *Money in the Pre-Industrial World: Bullion, Debasements and Coin Substitutes* (London, 2012), p. 73.

³³² Nicholas, *Medieval Flanders*, pp. 286–7.

supply to actually facilitate the cheapening of salt, which in turn made Zeeland salt less desirable to the market than the cheaper French-Iberian salt. Thus, Zeeland salt prices were trapped in a circular supply and demand conflict. As the Zeeland salt industry was in decline during the fifteenth century, and French salt dominated the salt trade during this period, French-Iberian salt will be compared to the salt prices of England and Scotland.

Figure 3.9 shows the comparison of nominal salt prices. English salt prices, like many of the animal product prices (and in contrast to grain prices), show deflation from the 1350s to the 1370s. Prices fell to the 1390s, and then had a brief decade of inflation in the 1400s. They then remained largely flat in the first half of the fifteenth century, with just one decade of inflation—the 1430s. Salt prices were deflationary in the 1460s and 1470s, but the inflation of the 1480s broke the trend. From there, salt prices rose into the sixteenth century. In Brabant, the French-Iberian salt prices show that there was inflation in the 1430s, and then price depression into the middle of the fifteenth century. There was an enormous amount of price inflation in the 1480s, which was followed by price stability in the 1490s and some deflation in the 1500s. In the 1510s and 1520s, French-Iberian salt prices inflated rapidly. In Scotland, salt prices show that there was generally little inflation in the fourteenth century. Salt prices rose in the 1410s, but then fell again. They crept up until the 1430s, and then declined in the 1440s. Salt prices then rose to the 1460s, fell in the 1470s, and increased in the 1490s. They maintained a low price during the 1500s and 1510s, but inflated heavily in the 1520s. Though the overall trend of Scottish salt prices is clearly inflationary, there was a lot more price variation between decades

than has been the case for most of the other commodities.

Figure 3.10 offers an overview of nominal wine prices. The bulk of English wine appears to have come from Gascony, as demonstrated by the numerous pieces of legislation passed by parliament concerning the Anglo-Gascon wine trade.³³³ Unfortunately the only available price series of English wine is from Portugal, not Gascony. Prices do not appear to have been overly volatile in England and, like salt prices, they again showed deflation from the 1350s to the 1390s. In the fifteenth century, English Port wine prices show smooth gradual inflation, yet there was no extraordinary inflation in the 1430s and 1480s. Likewise, there was no deflation in the 1440s.

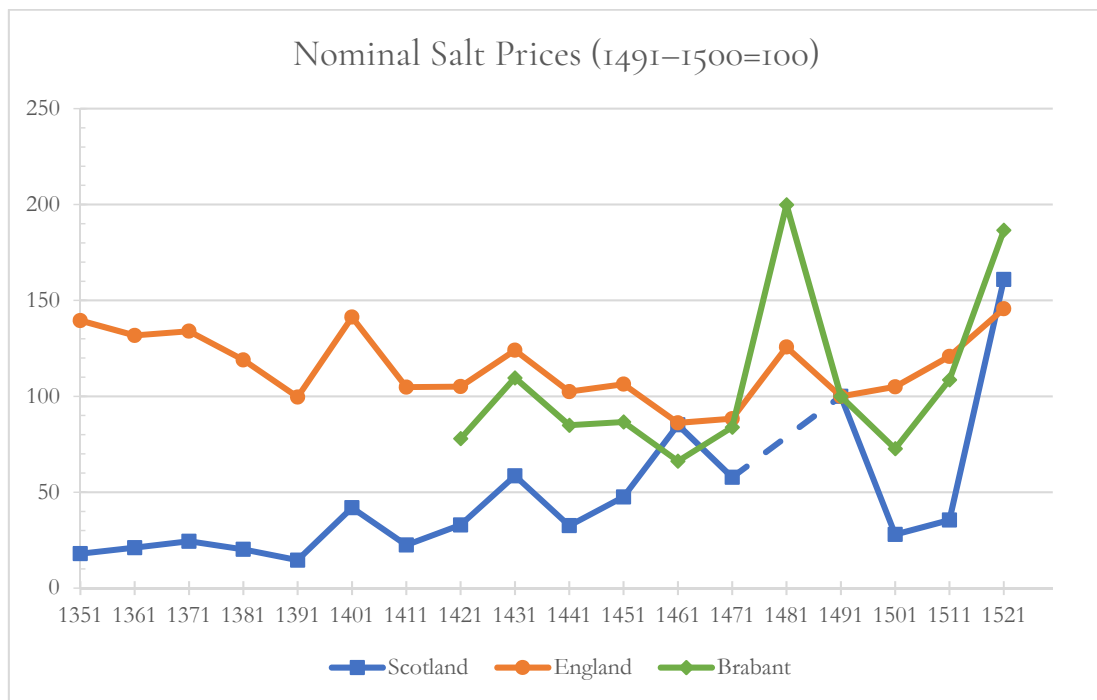


FIGURE 3.9

[Gemmill and Mayhew, *Changing Values*, pp. 328–31; Clark, ‘Price History’, pp. 35–105; van der Wee, *Growth of the Antwerp Market*, i, pp. 287–93.]

³³³ See *PROME*, viii, pp. 29–30 for legislation concerning complaints from Gascon wine merchants about customs taxation in October 1318; *ibid.*, ii, p. 166 for the 1348 subsidy; *ibid.*, ii, p. 287; *ibid.*, ii, p. 306.

Prices still rose in the sixteenth century, but the inflation appears less pronounced than it was for other commodities. The price series for wine in Brabant is for young Rhenish wine. Medieval wine was often preferred young, probably because it did not age well.³³⁴ Like cheese, herring, oat and many other commodity prices, Brabantine wine prices fell in the 1400s. They then rose until the 1430s, fell slightly in the 1440s and stabilised until the price inflation of the 1480s. There was still price inflation in the sixteenth century but, like in the case of England, the inflation was less dramatic for wine prices compared with other commodities. Scottish wine prices exist in good quantity, though they are not straightforward to interpret. Scottish wine mainly came from the Rhine or Gascony, but occasionally it came from Beaune. As wine was a luxury commodity, the Scottish burghs appear to have spent far less time constructing regulations to control its prices.³³⁵ Wine prices in Scotland were flat in the fourteenth century, but fell in the 1400s. They then had peaks of inflation in the 1430s, 1450s and 1480s. After a brief period of price stability in the 1490s and 1500s, Scottish wine prices inflated rapidly in the 1510s and 1520s.

Figure 3.11 shows that English wool prices in the fourteenth century followed a similar pattern to that of grain prices—they rose until the 1370s and then fell. Wool prices declined throughout the first half of the fifteenth century, reaching their nadir in the 1450s. Volatility was high in subsequent decades. Prices then stabilised in the 1490s and 1500s, and then inflated in the 1510s. This inflation does not appear to have continued to increase

³³⁴ Gemmill and Mayhew, *Changing Values*, p. 216.

³³⁵ *Ibid.*, pp. 217–19.

in the 1520s, however. In Scotland, wool prices show some inflation in the late fourteenth century. They then rose in the 1400s, fell in the 1410s, recovered in the 1420s, and then slumped in the middle of the fifteenth century. Scottish wool prices rose from the 1460s to the 1470s, but declined thereafter. Again, like other commodities, the overall trend of Scottish wool prices is still one of inflation.

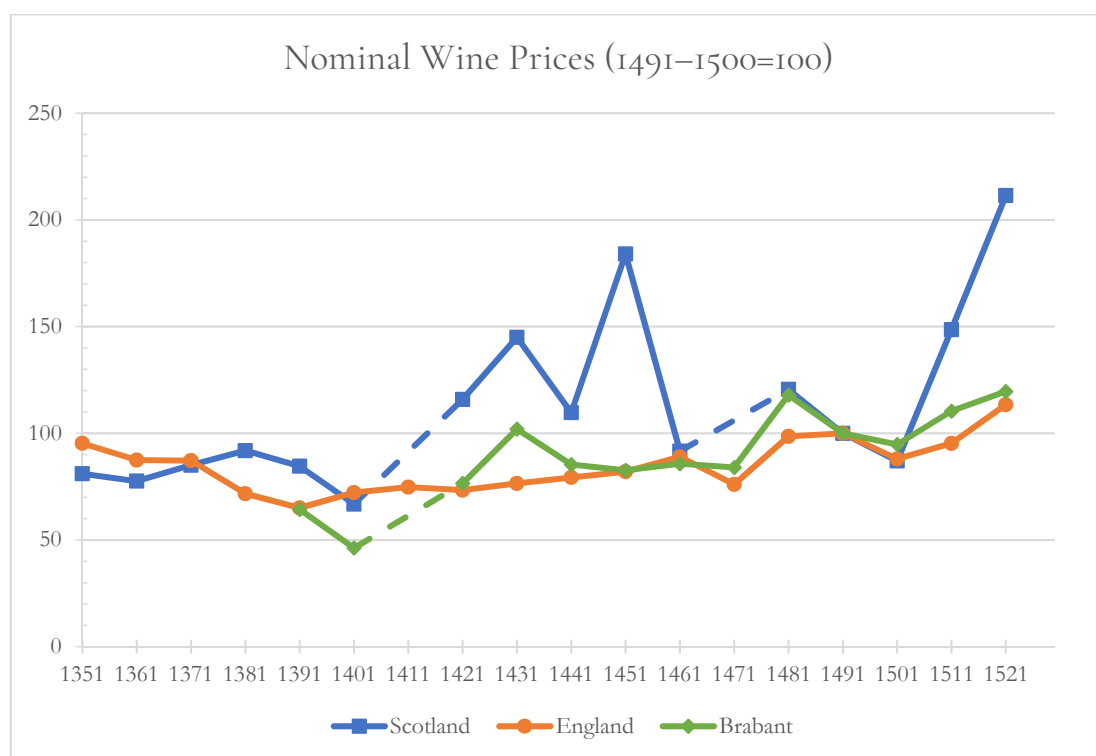


FIGURE 3.10

[Gemmill and Mayhew, *Changing Values*, pp. 222–32; Clark, ‘Price History’, pp. 35–105; van der Wee, *Growth of the Antwerp Market*, i, pp. 294–9.]

Though we do not have raw wool prices for the Low Countries, there are a few price datasets for different types of cloth in Flanders. The same is also true for England and Scotland. In the late medieval period, there were a number of different types of cloth. Canvas was frequently used for sacking, tents and sails. It was made from hemp rather

than wool. In contrast, linen was made from flax and was more commonly used for clothing.³³⁶ Coarse woollens were, of course, made from wool. This type of wool was more likely to have been used as outerwear.³³⁷ Scottish ‘black’ was a cheaper woollen cloth that was dyed black, in accordance with fifteenth-century fashion.³³⁸

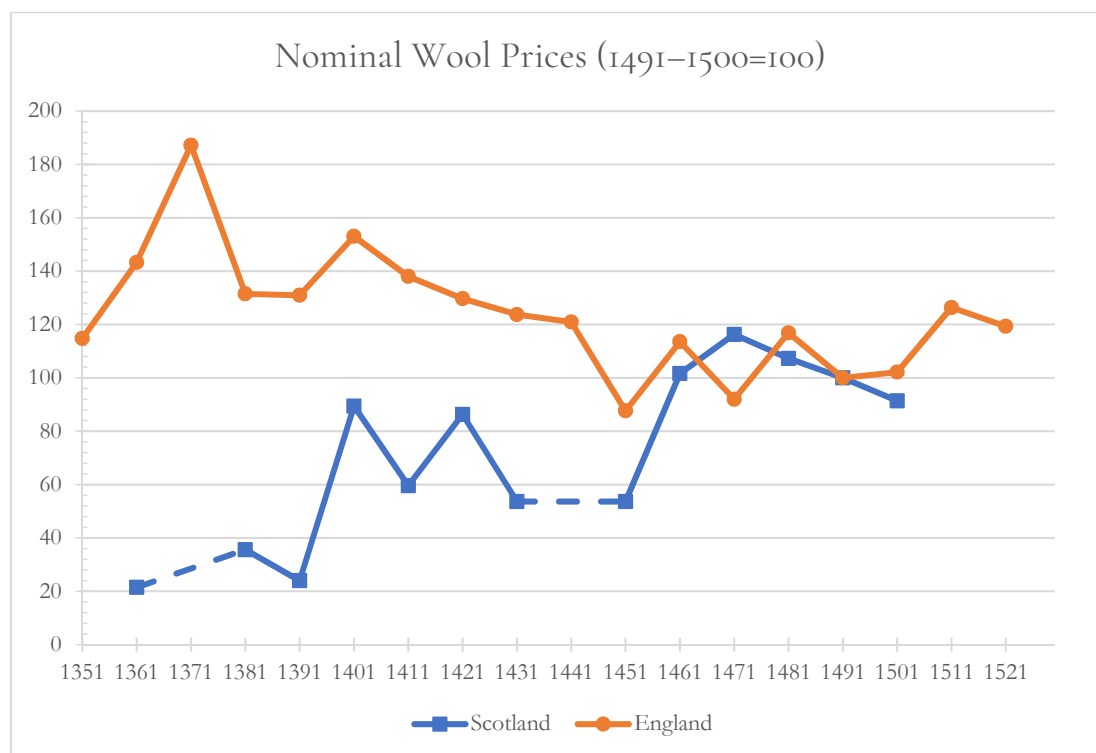


FIGURE 3.11

[Gemmill and Mayhew, *Changing Values*, pp. 288–91; Clark, ‘Price History’, pp. 35–105.]

It is now possible to compare cloth trends in England, Scotland and Flanders, Figure 3.12. After the initial inflation from the 1350s to the 1360s, English linen prices were clearly deflationary for the rest of the late medieval period. There was no dramatic price inflation in the early sixteenth century. English canvas prices were deflationary from the 1350s, and

³³⁶ Gemmill and Mayhew, *Changing Values*, p. 331.

³³⁷ Van der Wee, *Growth of the Antwerp Market*, i, p. 269.

³³⁸ Gemmill and Mayhew, *Changing Values*, pp. 353–4.

prices continued to fall until the 1390s. They then rose until the 1450s, thereafter they fell and maintained a trend of stagnation. As was the case for English linen prices, English canvas prices did not incur inflation in the early sixteenth century. In contrast, English coarse woollen prices were the least volatile of the English cloths and they show clear and sustained inflation for the entirety of the late medieval period. Flemish linen and stiff cloth prices seem to follow a similar pattern, though stiff cloth was slightly more inflationary. Both trends show inflation from the 1350s to the 1380s, followed by a slight decline in the 1390s. Linen and stiff cloth prices then inflated until the 1430s, but suffered from price decline until the 1470s. They appear to have peaked in the 1490s. Scottish canvas prices show that there was an overall trend of inflation. A lack of data makes it difficult to discern whether there was price stability in the fourteenth century, however. Scottish canvas prices peaked in the 1480s, but fell in the 1490s. They then incurred heavy inflation in the 1520s. Scottish 'black' prices show a similar trend to canvas prices, though the overall trend of inflation is more pronounced.

3.2 ACCOUNTING FOR PRICE TRENDS

It has become clear that there are some general recurring trends in the commodity prices of England, Scotland, Flanders and Brabant. Prices in England were generally prone to long periods of stagnation and even deflation. In contrast, though prices in Scotland were fairly stagnant across the later fourteenth century, they incurred heavy inflation in the fifteenth century, especially during the second half. Inflation was also a common feature of commodity prices in Flanders and Brabant, though there were particularly prominent troughs of deflation around the end of the fourteenth century and in the middle of the

fifteenth century. How do we account for these general trends, and how can we explain particular deviations from them? The next four sections will examine how population, debasement, mint output, climate and political/trade factors affected price trends.

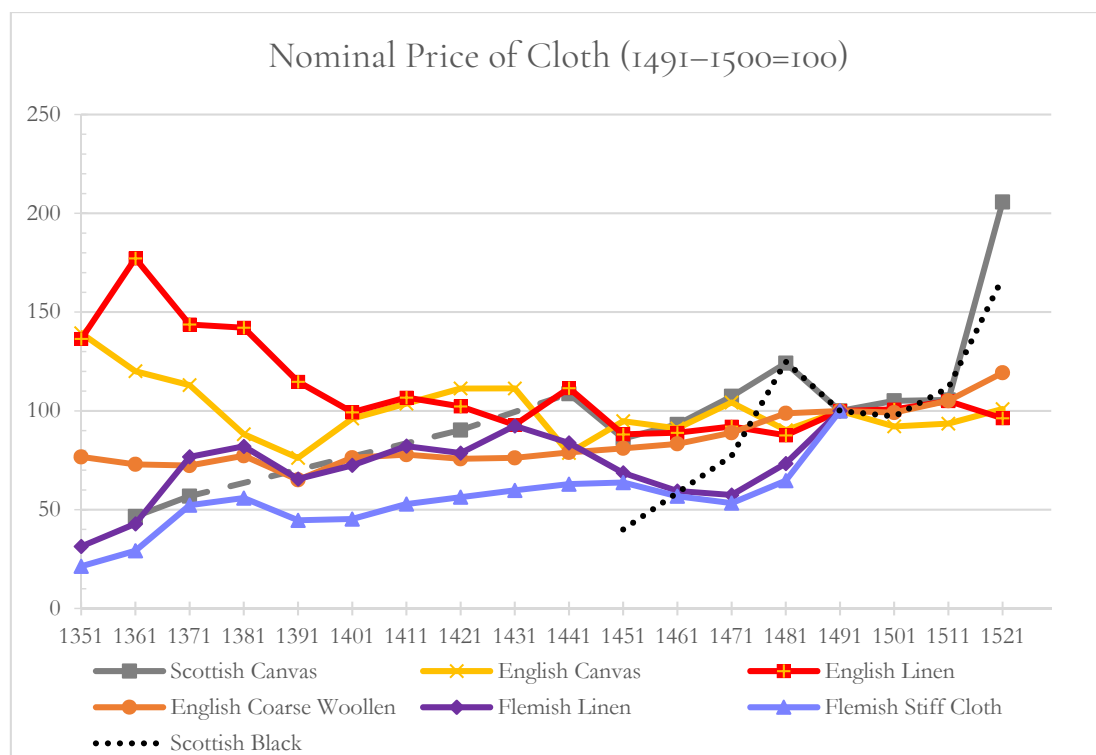


FIGURE 3.12

[Gemmill and Mayhew, *Changing Values*, pp. 332–7, 359–60; Clark, ‘Price History’, pp. 35–105; Munro, ‘English Prices and Wages Data’ (29 June 2018); Munro, ‘Flemish Prices and Wages Data’ (29 June 2018).]

3.2.1 POPULATION

The demographic theory places the greatest emphasis on the power of fluctuations in the size of the population to influence the general price level.³⁹⁹ This is because higher demand relative to supply could be expected to cause an increase in prices, while lower demand relative to supply could cause prices to fall. The previous section suggested that English

³⁹⁹ See Chapter 1, Section 1.2.

prices were commonly flat or deflationary, which already coincides with the narrative of persistently low population levels for most of the fifteenth century. The general inflation of Scottish prices from the fifteenth century onwards could well have coincided with the earlier recovery of the population following the Black Death. Likewise, it seems possible that the general inflationary trend of Flemish and Brabantine prices also coincided with the recovery of the population, yet this relationship was possibly damaged by the periods of deflation around the end of the fourteenth century, and in the middle of the fifteenth century.

This section quantitatively demonstrates the extent to which population could influence long-term price trends in England, Flanders and Brabant.³⁴⁰ Regression analysis is used to test the quantitative relationship between population levels and price movements. Unfortunately, it is not possible to include Scotland in this part of the analysis because there is insufficient population data to allow for the quantification of the relationship between the size of the population and the changes in the price level.

The clearest evidence of population acting to drive long-term price trends in England can be seen in the regression analysis of oat prices. To do this, the nominal oat prices are set as the dependent variable. Population, debasement, mint output and crop yield act as independent variables. In the form of an equation, this regression is expressed as:

$$\ln X_t = \beta_0 + \ln \beta_1 \text{Penny}_t + \ln \beta_2 \text{Yield}_t + \ln \beta_3 \text{Mint}_t + \ln \beta_4 \text{Pop}_t + \varepsilon_t$$

³⁴⁰ In order to keep the conclusions of this chapter as clear as possible, rather than examine all of the commodities for each section, I have selected the most pertinent results for each.

X_t is the nominal price of a unit of oats of England, Flanders and Brabant respectively in year t , β_0 is a constant, ε_t is an error term to account for the influence of other factors. The variable $\beta_2 Yield$ is the average annual crop yield of oats in England.³⁴¹ $\beta_3 Mint_t$ represents the tale value of the combined gold and silver mint output of a country in year t and $\beta_4 Pop_t$ is the respective population level. I have used annual data and transformed it into natural logarithms to smooth the figures, thus making this a ‘log-log’ regression model.³⁴²

To understand the extent to which each independent variable can account for the movements of the price level, the coefficient of determination (r^2) is used. R^2 is a figure ranging from 0 to 1, where 0 demonstrates that none of the dependent variable can be explained by the independent variable. An r^2 of 1 indicates that all the dependent variable’s movements can be accounted for by the movements of the independent variable.³⁴³ To express the r^2 as a percentage, the figure is simply multiplied by 100, i.e. an r^2 of 0.1 means that the independent variable accounts for 10% of the dependent variable’s movements.

Within this percentage, we can use the coefficient to work out the quantitative relationship between the two variables—i.e. the amount by which the dependent variable

³⁴¹ The English grain yield data is applied to Scotland, Flanders and Brabant, because there is no equivalent complete set of yields for these regions.

³⁴² I have not, however, lagged the price data against the independent variables. I decided not to do this because it would demand that it took at least a year for prices to react to changes in population, mint output or coin weight. We do not know how much of mint output made it into the money stock, or how long it would take. Spufford has argued that price reactions could follow a debasement in as little time as one or two months. See Spufford, ‘Debasement of the Coinage’, p. 64.

³⁴³ For a more detailed explanation of r^2 , see C. H. Feinstein and M. Thomas, *Making History Count: A Primer in Quantitative Methods for Historians* (Cambridge, 2002), pp. 105–9.

will move if the independent variable increases by 1%. Because I use log-log regressions, this percentage is obtained by taking the coefficient as a percentage.³⁴⁴ Thus, a coefficient of 0.4 will mean that if the independent variable's value rises by 1%, the dependent variable's value will rise by 0.4%. Finally, it is important to note the significance of each coefficient. This is indicated by the presence of asterisks next to the coefficients.

To discern the effects of population within the context of other independent variables, it is necessary to begin with a combined regression analysis, where all independent variables are regressed simultaneously, therefore showing the effect of each within the context of the others. To explain price changes by movements in the population level, we would expect the population coefficient to be positive—as population increased, demand rose and thus prices should have risen if the supply could not increase in tandem. Beginning with the strongest of the results among all the commodities, Figure 3.13.1 shows that this result is found within the combined regression analysis for England, where a 1% increase in population is suggested to have caused a 0.631% increase in oat prices. For Flanders, the negative coefficient and lack of statistical significance calls into question any sort of demographic driver on oat prices. In Brabant, however, a coefficient of 2.681, significant at the 10% level, suggests that there was probably some influence of population levels on prices.³⁴⁵

³⁴⁴ When variables have been logarithmically transformed, the coefficient can be read as representative of a one-unit change in *A* equating to the change in *B*. See Kenneth Benoit, 'Linear Regression Models with Logarithmic Transformations' (London, 2011), <<http://kenbenoit.net/assets/courses/ME104/logmodels2.pdf>> (27 July 2018), p. 3.

³⁴⁵ The significance results given in this thesis are based on the $p > |t|$ value given in a two-tailed significance test. For a detailed explanation of statistical significance, see Feinstein and Thomas, *Making History Count*, pp. 117–44.

	<i>England</i>	<i>Scotland</i>	<i>Flanders</i>	<i>Brabant</i>
<i>d. Weight (silver)</i>	0.769*** (0.131)	-1.107*** (0.36)	-0.028 (0.082)	-1.214*** (0.359)
<i>Oat Yield</i>	-0.017 (0.026)	-0.043 (0.107)	0.034 (0.032)	0.04 (0.05)
<i>Mint Output</i>	0.03*** (0.015)	0.114 (0.146)	0.003 (0.015)	0.013 (0.043)
<i>Population</i>	0.631*** (0.214)	N/A	-0.483 (0.479)	2.681* (1.518)
<i>N</i>	138	21	94	41
<i>R²</i>	0.4594	0.2485	0.0289	0.4253

FIGURE 3.13.1

Combined Log-Log Regression Analysis of Nominal Oat Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.3; Campbell, ‘Three Centuries of English Crop Yields’ (4 February 2018).]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

When the independent variables are regressed separately, it becomes clearer still that population was the main driver of long-term oat prices in England, Figure 3.13.2. In England, the r^2 suggests that population accounted for 34.55% of oat price movements, and that a 1% increase in population could have caused a 1.55% increase in oat prices. This result is sensible, given that Chapter 2 showed England’s population was suffering from gradual decline over most of the fifteenth century, and Section 3.1 showed that England’s commodity prices were generally flat or deflationary over the same period. In contrast, the regression of individual independent variables leaves both Flanders and Brabant with statistically insignificant negative coefficients, suggesting that there was little individual driving power of population on oat prices.

	<i>England</i>				<i>Scotland</i>				<i>Flanders</i>				<i>Brabant</i>			
<i>d. Weight (silver)</i>	0.533*** (0.116)				-0.94*** (0.09)				-0.037 (0.059)				-0.683*** (0.058)			
<i>Oat Yield</i>	-0.036 (0.052)				-0.074 (0.099)				0.024 (0.025)				0.021 (0.039)			
<i>Mint Output</i>	0.054*** (0.0161)				-0.008 (0.112)				0.003 (0.014)				0.11*** (0.036)			
<i>Population</i>	1.55*** (0.162)				N/A				-0.107 (0.36)				-0.347 (0.454)			
<i>N</i>	176	138	176	176	80	42	32	N/A	150	138	123	131	163	122	82	155
<i>R²</i>	0.1389	0.0059	0.0606	0.3455	0.4091	0.0053	0.0001	N/A	0.0035	0.0036	0.004	0.0010	0.5080	0.0009	0.1209	0.0039

FIGURE 3.13.2

Individual Log-Log Regression Analysis of Nominal Oat Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.3; Campbell, 'Three Centuries of English Crop Yields' (4 February 2018).]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Similar conclusions can be found in other commodities. Barley, which was far more widely consumed by humans in England than oats, was still most clearly driven by fluctuations in the population level than by any other independent variable, Figure 3.14.1. Here it can be seen that a 1% increase in the population size could have increased prices by 1.509%. Yet for Flanders and Brabant, it is even more evident that ascertaining a clear link between demographic change and prices is impossible—a lack of statistical significance and negative coefficients cast into doubt whether population decline caused price depression when other factors were also at play.

	<i>England</i>	<i>Scotland</i>	<i>Flanders</i>	<i>Brabant</i>
<i>d. Weight (silver)</i>	0.321* (0.172)	-1.189*** (0.119)	-0.428*** (0.115)	-0.363 (0.304)
<i>Barley Yield</i>	-0.212 (0.042)	0.064 (0.084)	0.117** (0.058)	0.158* (0.088)
<i>Mint Output</i>	0.036** (0.017)	-0.1* (0.05)	-0.007 (0.016)	0.032 (0.047)
<i>Population</i>	1.509*** (0.274)	N/A	-0.613 (0.528)	-2.4 (1.684)
<i>N</i>	138	28	94	41
<i>R²</i>	0.4332	0.8543	0.1762	0.3447

FIGURE 3.14.1

Combined Log-Log Regression Analysis of Nominal Barley Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.1; Campbell, ‘Three Centuries of English Crop Yields’ (4 February 2018).]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

These conclusions become clearer still when the independent variables are regressed individually against nominal barley prices. Figure 3.14.2 shows that population change accounted for 31.43% of nominal barley price movements in England. Within that percentage of price movements, a 1% increase in population could have caused a 1.826%

	<i>England</i>				<i>Scotland</i>				<i>Flanders</i>				<i>Brabant</i>			
<i>d. Weight (silver)</i>	0.6336*** (0.076)				-1.19*** (0.062)				-0.284*** (0.0757)				-0.773*** (0.052)			
<i>Barley Yield</i>	-0.119** (0.056)				-0.363** (0.14)				-0.065 (0.051)				-0.059 (0.08)			
<i>Mint Output</i>	0.07** * (0.019)				-0.109 (0.139)				-0.164 (0.016)				0.127*** (0.034)			
<i>Population</i>	1.826*** (0.206)				N/A				-0.034 (0.462)				-0.059 (0.509)			
<i>N</i>	180	138	180	180	85	46	40	N/A	150	138	123		161	120	82	153
<i>R²</i>	0.1317	0.0329	0.0684	0.3143	0.7611	0.054 1	0.0250	N/A	0.1167	0.0121	0.0061	0.0001	0.5449	0.004	0.1356	0.0001

FIGURE 3.14.2

Individual Log-Log Regression Analysis of Nominal Barley Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.1; Campbell, 'Three Centuries of English Crop Yields' (4 February 2018).]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

increase in English barley prices. This is slightly stronger than the coefficient given in the case of combined regression [Figure 3.14.1], which suggests that other independent variables clearly had some impact on barley price trends. In the case of Flanders and Brabant, individually regressing the independent variables against nominal barley prices further illustrates the lack of statistical relationship between population change and prices. As was the case for the combined regression analysis, there is no statistically significant relationship between nominal barley prices and population change. Again, the weak and negative coefficients for both Flanders and Brabant suggest that, if anything, prices fell as population rose. This is certainly contrary to what we would expect if population levels were clearly driving price trends in the Low Countries.

The primacy of demographic drivers in English price trends is not confined to the prices of farinaceous goods and the findings are repeated in a number of other commodity price trends. This can be seen, for example, by regressing the nominal price trends of salmon against the English population estimates. In the combined regression, all the independent variables together explain a total of 29.28% of nominal salmon price fluctuations in England, Figure 3.15.1. However, only population is statistically significant to the 1% level. Within the context of the other independent variables, therefore, a 1% increase in population could have caused a 1.52% rise in salmon prices in England.

	<i>England</i>	<i>Scotland</i>
<i>d. Weight (silver)</i>	3.359 (2.518)	0.125 (0.55)
<i>d. Weight (gold)</i>	-2.124 (1.882)	-0.47 (0.549)
<i>Mint Output</i>	0.055* (0.03)	-0.054 (0.036)
<i>Population</i>	1.52*** (0.367)	N/A
<i>N</i>	68	25
<i>R</i> ²	0.2928	0.37

FIGURE 3.15.1

Combined Log-Log Regression Analysis of Nominal Salmon Prices

[As Figures 2.5, 2.9, 2.14, 2.18 and 3.6]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

The regression of individual independent variables against salmon prices further highlights the importance of population levels as a driver of long-term price trends. Figure 3.15.2 shows that the size of the English population could have been responsible for 19.8% of the nominal salmon price fluctuations. Within that parameter, a 1% increase in population possibly caused a 1.213% increase in prices.

	<i>England</i>				<i>Scotland</i>			
<i>d. Weight (silver)</i>	-0.47** (0.23)				-0.407*** (0.081)			
<i>d. Weight (gold)</i>	-0.369** (0.178)				-0.358*** (0.084)			
<i>Mint Output</i>	0.077*** (0.024)				0.0002 (0.027)			
<i>Population</i>	1.213*** (0.294)				N/A			
<i>N</i>	68	68	68	68	71	71	25	N/A
<i>R</i> ²	0.0688	0.0725	0.1674	0.198	0.2689	0.23	0.0000	N/A

FIGURE 3.15.2

Individual Log-Log Regression Analysis of Nominal Salmon Prices

[As Figures 2.5, 2.9, 2.14, 2.18 and 3.6]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is

significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Though the importance of population changes as a long-term driver of price trends in England can also be seen in the data of many other commodities,³⁴⁶ this conclusion cannot be applied indiscriminately across all English price series. Indeed, there are a few examples where the influence of population is less statistically significant than other independent variables, or has a weaker r^2 . One such example of the latter can be found by conducting a regression analysis of wheat prices. Though Figure 3.16.1 shows that when the independent variables are combined, population is the only factor with statistical significance at the 1% level, this is not the case when the independent variables are regressed individually. Figure 3.16.2 suggests that wheat yields accounted for more of the overall trend of English wheat prices—the r^2 of 19.39% is far superior to the 9.69% of population.³⁴⁷

	<i>England</i>	<i>Scotland</i>	<i>Flanders</i>	<i>Brabant</i>
<i>d. Weight (silver)</i>	-0.363** (0.179)	-0.746*** (0.088)	-0.474*** (0.109)	-0.088 (0.256)
<i>Wheat Yield</i>	-0.056 (0.042)	-0.123** (0.337)	-0.1** (0.049)	-0.236** (0.092)
<i>Mint Output</i>	-0.017 (0.018)	-0.076 (0.05)	-0.014 (0.016)	0.004 (0.043)
<i>Population</i>	1.176*** (0.308)	N/A	-0.974 (0.587)	-2.71** (1.014)
<i>N</i>	136	33	91	33
<i>R²</i>	0.26237	0.7989	0.2432	0.2934

FIGURE 3.16.1

Combined Log-Log Regression Analysis of Nominal Wheat Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.2; Campbell, ‘Three Centuries of English Crop Yields’ (4 February 2018).]

³⁴⁶ I have also found that population was the greatest and most statistically significant driver of English price trends in the cases of cows, cheese and salt.

³⁴⁷ The relationship between crop yields and grain prices will be discussed later in Section 3.2.4.

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Population also fails to adequately account for the long-term trend of herring prices in England. Figure 3.17.1 shows that while population was significant to the 1% level in the combined regression analysis, the coefficient is negative. This suggests that as population fell, prices rose. This is clearly contrary to the expectation of the demographic model. The negative coefficient is not the result of multicollinearity or some other symptom of combined regression, however, because Figure 3.17.2 shows that the negative coefficient remains when the independent variables are regressed individually.

	<i>England</i>	<i>Scotland</i>	<i>Brabant</i>
<i>d. Weight (silver)</i>	-0.453 (0.762)	-6.517 (4.1)	-0.74*** (0.145)
<i>d. Weight (gold)</i>	0.453 (0.635)	5.16 (3.254)	-0.161 (0.148)
<i>Mint Output</i>	0.03** (0.014)	0.167 (0.441)	-0.011 (0.027)
<i>Population</i>	-0.692*** (0.204)	N/A	1.292*** (0.39)
<i>N</i>	170	10	73
<i>R</i> ²	0.0726	0.5624	0.5063

FIGURE 3.17.1

Combined Log-Log Regression Analysis of Nominal Herring Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.5]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

It is evident that the impact of population on long-term prices in England cannot be ignored. Only in a very small minority of commodity prices does it appear that population was a weaker driver of long-term trends than the other independent variables. In contrast, it has become clear that there was little consistent influence of population in

the trends of most Flemish and Brabantine prices—it was common for population to have a negative coefficient or little statistical significance.

Though this section has shown that fluctuations in the population level were an important factor in long-term price movements in England, it also demonstrated that population cannot explain all the English price trends. Indeed, the failure of the population variable's r^2 to account for even half of price fluctuations in England suggests that there was still a great deal of influence from other independent variables. Likewise, it is evident that other independent variables were more significant drivers of price trends in Flanders and Brabant. Thus, the remainder of this chapter explores the impact of monetary, environmental and political factors on price trends.

3.2.2 DEBASEMENT AND MINT OUTPUT

It became clear in the previous section that while demographic forces were able to explain the overall long-term trends of the majority of commodity prices in England, there were still some exceptions. Furthermore, demographic forces fell short of explaining long-term price trends in Flanders and Brabant. Thus, it is necessary to explore the role of other independent variables in the determination of long-term price trends. Testing the impact of debasement on price trends is straightforward, more so than testing the effect of population. This is because we have greater certainty of the fine metal weight of denominations than we do of national population levels. However, because it is unknown whether payments were made in gold or silver and I utilise both gold and silver denominations to test the impact of debasement, I have only included the gold currency if the individual unit price of the commodity exceeded the value of the main gold coin.

	<i>England</i>				<i>Scotland</i>				<i>Flanders</i>				<i>Brabant</i>			
<i>d. Weight (silver)</i>	-0.188 (0.13)				-0.88*** (0.063)				-0.268*** (0.079)				-0.644*** (0.104)			
<i>Wheat Yield</i>	-0.194*** (0.066)				-0.494*** (0.106)				-0.21*** (0.064)				-0.056 (0.05)			
<i>Mint Output</i>	0.033* (0.018)				-0.173* (0.089)				-0.02 (0.017)				0.094** (0.037)			
<i>Population</i>	0.928*** (0.222)				N/A				-0.29 (0.463)				-0.424 (0.594)			
<i>N</i>	180	136	180	180	109	72	44	N/A	150	136	123	131	100	58	75	96
<i>R²</i>	0.0139	0.1939	0.0177	0.0969	0.68	0.1549	0.1108	N/A	0.0847	0.1574	0.0076	0.0032	0.2479	0.0141	0.0737	0.007

FIGURE 3.16.2

Individual Log-Log Regression Analysis of Nominal Wheat Prices

[As Figures 2.5, 2.12, 2.16, 2.18, 2.21 and 3.2; Campbell, 'Three Centuries of English Crop Yields' (4 February 2018).]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

	<i>England</i>				<i>Scotland</i>				<i>Brabant</i>			
<i>d. Weight (silver)</i>	-0.564 (0.092)				-0.574*** (0.117)				-0.728*** (0.045)			
<i>d. Weight (gold)</i>	-0.026 (0.078)				-0.516*** (0.12)				-0.687*** (0.102)			
<i>Mint Output</i>	-0.0004 (0.013)				-0.294** (0.098)				0.131*** (0.0291)			
<i>Population</i>	-0.563*** (0.169)				N/A				0.372 (0.493)			
<i>N</i>	170	170	170	170	39	39	10	N/A	144	95	80	140
<i>R²</i>	0.0018	0.0006	0.0000	0.0552	0.3365	0.3230	0.2587	N/A	0.6647	0.4036	0.2068	0.0047

FIGURE 3.17.2

Individual Log-Log Regression Analysis of Nominal Herring Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.5]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

For England and Scotland, this sets the benchmark at 60d., and at 40d. for the Low Countries. The rate of debasement of the gold and silver currencies is expressed by calculating a penny's worth of grains of gold or silver. In the case of the silver currency, this means that I have normally been able to use the weight of a penny. For gold, it has been necessary to divide the weight of the coin by its nominal 'tale' value in pence. In addition to debasement, this section also examines the impact of mint output on price trends. Using the data assembled in Chapter 2, I examine the relationship between the total value of the mint output and the price trends of a number of commodities. Though Chapter 2 acknowledged that gold and silver served different roles in the economy, and thus separating the mint output into gold and silver would be a more preferable means of accounting for this acknowledgement within quantity theory, I have kept mint output as a combined total of gold and silver. This is because the Fisher Identity ($MV=PT$) does not allow for the subdivision of M with respect to its impact on P .

As was the case for population, quantitatively measuring the impact of both debasement and the changes in mint output can be done with regression analysis. To hint at causality, the results would be expected to fall within the following two paradigms: 1) if the debasement of the currency was driving prices, then a negative coefficient is expected because as the intrinsic value of the currency fell, prices would have needed to increase to offset the loss; 2) a positive coefficient is expected if mint outputs (and the money stock) were driving prices—if the money stock increased, the Fisher Identity dictates that

there should have been an increase in the general price level.³⁴⁸

Seeing the short- and medium-term impact of debasement on prices is rather easy. For England, we can examine the price trends of any commodity around the decades where debasements took place and find that there is rarely any pronounced reaction to the change in the currency's weight. For example, most commodity prices do not show any sort of nominal price increase in the 1410s, following the 1411 debasement.³⁴⁹ It is more common to see rising prices in England in the 1460s, following the 1464 debasement, but this appears to be part of a general upward drift in prices, which began a decade or two earlier.³⁵⁰ In the cases of oats, cheese, salt, canvas and linen, prices actually fell in the 1460s relative to the previous decade.³⁵¹ The impact of the 1526 debasement is also difficult to discern because it falls within a period of general price inflation in England, which began at the end of the fifteenth century. We must, of course, acknowledge the possibility that the 1526 debasement exacerbated the inflation that was already prevalent.

In Scotland, there appears to have been little price reaction to the debasement of 1367, presumably on account of David II's ransom payments draining much of the new money from Scotland.³⁵² The price inflation of the fifteenth century is more consistent with the policy of fairly frequent debasement throughout the fifteenth century. Particularly evident is the price peak in the 1480s, which coincides with James III's flooding the market

³⁴⁸ See above, p. 15.

³⁴⁹ The exceptions are herring, cheese, wine, canvas, linen and coarse woollen cloth prices.

³⁵⁰ Such as in the price trends of barley, wheat, herring, salmon and wine. See Figures 3.1, 3.2, 3.5, 3.6 and 3.10 respectively.

³⁵¹ See Figures 3.3, 3.7, 3.9 and 3.12 respectively.

³⁵² See Chapter 2, p. 94.

with black money.³⁵³ Prices quoted in this black money rose dramatically.³⁵⁴ When debasement continued in the late fifteenth and early sixteenth centuries, it was also common to see protracted inflation in a number of commodity price trends during this period.³⁵⁵

In Flanders and Brabant, there are also instances where the role of debasement affected price trends in the short to medium term. Section 3.1 showed that most commodity price trends in the Low Countries incurred inflation from the 1350s to the 1380s/90s. This also aligns with expectations of inflation resulting from debasement, as this period was one in which a series of frequent debasements and reinforcements to the Flemish and Brabantine currencies were made. With more debasement in the early fifteenth century, it is unsurprising that prices generally increased after the bullion famine's effects were dying down. Philip the Good's currency unification of 1433, which came with a mild reinforcement of the currency's weight, did not cause price deflation immediately, however. Instead, prices tended to rise in this decade. In the Low Countries, prices declined thereafter, but inflation resumed when a new bout of debasement was initiated in the 1460s. As we have seen in England, and Scotland, prices were particularly prone to inflation towards the end of the fifteenth century and in the early sixteenth century. This coincided with the reopening of the silver mines in Central Europe, and with the more regular debasement in this period.

³⁵³ *Ibid.*, p. 73.

³⁵⁴ Malt was quoted at 360d. of black money per bol in 1482, whereas a bol had been about 120d. of white money in 1480. Oatmeal went from c.60d. per bol in 1480 to c.120 d. per bol in 1482. Gemmill and Mayhew, *Changing Values*, p. 185, 194.

³⁵⁵ This is especially clear in the price trends of wheat, oats and wine. See Figures 3.2, 3.3 and 3.10 respectively.

The role of debasement as a determinant of long-term commodity price trends in England is most clearly, and exclusively, seen in the data concerning internationally traded commodities. This point is most clearly illustrated by examining the relationship between debasement and cloth prices. Figure 3.18.1 shows that when the independent variables are combined, the strongest coefficient for England can be seen in the debasement of the silver currency, with a 1% increase in the weight of the penny translating into a 1.742% decrease in cloth prices. Notably, the coefficient for gold is positive. Though this theoretically suggests that as the gold currency was debased, English cloth prices fell, this does not seem plausible given that Chapter 2 showed that the gold and silver denominations were debased in tandem and proportion. Thus it is likely that this is evidence of multicollinearity, which can arise when one independent variable can act as the predictor of the other.³⁵⁶ These same conclusions are also true of Scotland, where the debasement of the silver currency was strongly and negatively linked to cloth prices, while there was a positive relationship between cloth prices and the debasement of the gold currency. In Flanders, it is also evident that the debasement of the currency was the most important independent variable for cloth price trends because the debasement of the gold currency generates the desired negative coefficient, and a significance level below 1% strengthens the finding. As has been the case for England and Scotland, multicollinearity also appears to ail the Flemish data, for there is a weak positive coefficient for the debasement of the silver currency.

³⁵⁶ For a detailed explanation of multicollinearity, see Feinstein and Thomas, *Making History Count*, pp. 321–3.

	<i>England</i>	<i>Scotland</i>	<i>Flanders</i>
<i>d. Weight (silver)</i>	-1.742*** (0.403)	-1.97** (0.695)	0.216 (0.152)
<i>d. Weight (gold)</i>	0.637* (0.339)	0.28 (0.441)	-0.667*** (0.139)
<i>Mint Output</i>	-0.047*** (0.009)	-0.009 (0.058)	-0.042*** (0.011)
<i>Population</i>	0.913*** (0.109)	N/A	-1.116*** (0.275)
<i>N</i>	180	11	97
<i>R²</i>	0.6799	0.7445	0.5159

FIGURE 3.18.1

Combined Log-Log Regression Analysis of Nominal Coarse Woollen, Stiff Cloth and Scottish 'Black' Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.12]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

The appearance of multicollinearity is eliminated when the independent variables are regressed individually. Figure 3.18.2 demonstrates that the debasement of both the gold and the silver currencies was statistically significant to the 1% level, and had the expected negative coefficient for England, Scotland and Flanders. It is also notable that for England and Scotland, the coefficient is more negative for silver than for gold. This suggests that silver was more inflationary than gold, a conclusion found by Casson and Casson's simultaneous equation model of the medieval English economy.³⁵⁷ The same conclusion is not repeated for Flanders, where the coefficient for gold is slightly stronger than for silver.

³⁵⁷ Casson and Casson, 'Modelling the Medieval Economy', p. 65.

	<i>England</i>				<i>Scotland</i>				<i>Flanders</i>			
<i>d. Weight (silver)</i>	-0.805*** (0.064)				-1.34*** (0.293)				-0.768*** (0.068)			
<i>d. Weight (gold)</i>	-0.684*** (0.053)				-1.098*** (0.274)				-0.802*** (0.065)			
<i>Mint Output</i>	0.014 (0.012)				0.089 (0.074)				-0.086*** (0.023)			
<i>Population</i>	0.135 (0.17)				N/A				-0.678 (0.358)			
<i>N</i>	180	180	180	180	25	25	11	N/A	150	115	123	131
<i>R</i> ²	0.5526	0.5589	0.0075	0.0045	0.6354	0.5367	0.0893	N/A	0.6452	0.6826	0.1083	0.0412

FIGURE 3.18.2

Individual Log-Log Regression Analysis of Nominal Coarse Woollen, Stiff Cloth and Scottish ‘Black’ Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.12]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

We can create further certainty of the role of debasement in the long-term price trends of England’s imported and exported commodities by examining the price trends of wine. Port wine—which is the data we have for England—was, by its nature, entirely imported to England. Though the role of population remains important, like cloth prices there is evidence of an inverse relationship between the weight of the English silver currency and the value of Port wine. Multicollinearity presumably prevents an inverse relationship between the weight of the English gold currency and Port wine prices from manifesting itself. The same inverse relationship is present in the weight of the Scottish gold currency, and in the weights of both the Brabantine gold and silver currencies.

	<i>England</i>	<i>Scotland</i>	<i>Brabant</i>
<i>d. Weight (silver)</i>	-1.101 (0.945)	0.552 (1.082)	-0.208 (0.126)
<i>d. Weight (gold)</i>	0.399 (0.798)	-0.672 (1.018)	-0.217 (0.133)
<i>Mint Output</i>	-0.032** (0.014)	-0.024 (0.038)	-0.001 (0.019)
<i>Population</i>	1.159*** (0.205)	N/A	0.705*** (0.219)
<i>N</i>	166	38	73
<i>R²</i>	0.329	0.1247	0.3447

FIGURE 3.19.1

Combined Log-Log Regression Analysis of Nominal Wine Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.10]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Though Figure 3.19.1 suggests that the role of population also helped to drive wine prices in Brabant, it is likely that this is predominantly a statistical oddity arising from the combined regression; Figure 3.19.2 shows that when the independent variables are

regressed individually, the positive coefficient of the Brabantine population falls dramatically and loses statistical significance. Instead, the strongest coefficients are seen in the debasements of the gold and silver Brabantine currencies, both of which are significant at the 1% level. In Brabant, the debasement of the silver currency explains 47.35% of wine price movements, while the debasement of the gold currency explains 30.65%. The primacy of debasement as a determinant of wine prices is also more evident in England and Scotland when the independent variables are regressed individually. In England, the debasement of the gold currency accounts for the greatest amount of wine price fluctuations, explaining 17.17%. The debasement of the silver currency accounts for 15.69% of wine price movements. Even the gold currency accounts for a slightly greater percentage of wine price fluctuations in England; the coefficient for the silver currency is more negative, suggesting that, as was the case for cloth prices, silver had more inflationary power than gold. For Scotland, the debasement of the silver currency has a slightly higher r^2 than gold, accounting for 22.94% of wine price fluctuations. As was the case for England, the coefficient is more strongly negative for silver than gold, further suggesting that silver might have been more inflationary.

It has become evident that in the case of traded goods, the role of debasement was far more prominent in England than it was for other commodities. Why are traded goods the only commodities whose price trends reflect English debasement? One possible explanation is that English traded commodities reflected the gradual debasement of the currency *because* their value was at least partly based on the value of the currency.

	<i>England</i>				<i>Scotland</i>				<i>Brabant</i>			
<i>d. Weight (silver)</i>	-0.483*** (0.094)				-0.247*** (0.047)				-0.517*** (0.059)			
<i>d. Weight (gold)</i>	-0.422*** (0.077)				-0.224*** (0.043)				-0.374*** (0.078)			
<i>Mint Output</i>	0.028** (0.013)				-0.065** (0.031)				0.052*** (0.019)			
<i>Population</i>	0.726*** (0.158)				N/A				0.152 (0.333)			
<i>N</i>	166	166	166	166	70	70	38	N/A	115	94	79	111
<i>R</i> ²	0.1569	0.1717	0.0234	0.1004	0.2294	0.2207	0.0487	N/A	0.4735	0.3065	0.0909	0.0021

FIGURE 3.19.2

Individual Log-Log Regression Analysis of Nominal Wine Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.10]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Indeed, Chapter 2 suggested the plausibility that merchants were more likely to weigh gold coins because of their role in trade.³⁵⁸ The fact that the silver currency was debased in proportion to the gold currency meant that the act of weighing gold coins took into account changes in both the gold and the silver denominations. Thus, it can be convincingly argued that the prices of these traded commodities more consistently reflected changes in the weight of the English currency because this information mattered on the international market. Furthermore, Chapter 2 showed that English woollen exports spiked after the 1464 debasement, suggesting that the relative debasement of the English currency was able to cheapen exports and increase trade volume.³⁵⁹ So, it is entirely plausible that goods heavily involved in trade might have been more prone to following the value of the English currency because they derived part of their value from it.

Yet we must also consider the possibility that this relationship between traded goods and the debasement of the English currency is at least somewhat spurious. Chapter 2 showed that the weight of the English gold and silver currencies fell over time, and thus to get a negative coefficient from the regression analysis, prices need to have followed an upward trend. Though the majority of English commodity price trends showed a flat or deflationary pattern, those of traded goods tended to show mild inflation. While inflation could have been caused by the debasement of the currency, as was commonly the case in Scotland, Flanders and Brabant, there are other reasons why these commodities might have broken from the general price trends. One reason why the prices of traded

³⁵⁸ See p. 59.

³⁵⁹ See p. 51.

goods might have been more inflationary than other commodities is because there was greater demand for them in the post-Black Death period. It is well noted that the late fourteenth and fifteenth centuries saw an increase in demand for luxury items.³⁶⁰ Cloth and Port wine certainly fell into this category. But so did meat, and it has been seen that cow prices in England were deflationary, Figure 3.4. Thus, while it is possible that there was greater demand for wine and cloth, and this rise in demand caused some price inflation, it is not reasonable to conclude with certainty that shifting consumer patterns were to blame.

It is also possible that 'value added' of commonly traded goods interfered with the general price trends and helped to prevent traded goods from suffering the same decline in value as raw commodities. Indeed, most of the commodities that were traded had a high labour input. For example, by examining wool prices it can be suggested that the additional labour (i.e. 'value added') involved in the cloth-making process was the cause of the deviations from the long-term price trends of other English commodities. Figure 3.20.1 shows that the debasement of the silver currency was significant at the 5% level, and that a 1% increase in the weight of the silver penny would have caused a 1.557% decrease in wool prices (or vice versa). Again, multicollinearity interferes with the findings as the debasement of the gold currency's coefficient presents itself as positive. Though the debasement of neither the silver nor the gold Scottish currencies had statistically significant relationships, it is nonetheless clear that the negative coefficients suggest that there was

³⁶⁰ Dyer, *Standards of Living*, pp. 158–60; V. N. Bateman, *Markets and Growth in Early Modern Europe* (London, 2012), p. 25; A. Alcock, *A Short History of Europe: From the Greeks and the Romans to the Present Day* (Basingstoke, 1998), p. 90.

still the expected inverse relationship between debasement and inflation.³⁶¹

	<i>England</i>	<i>Scotland</i>
<i>d. Weight (silver)</i>	-1.557** (0.669)	-0.983 (5.579)
<i>d. Weight (gold)</i>	1.684*** (0.571)	-0.262 (5.737)
<i>Mint Output</i>	-0.018 (0.016)	-0.355 (0.502)
<i>Population</i>	0.881*** (0.206)	N/A
<i>N</i>	180	7
<i>R</i> ²	0.2781	0.4208

FIGURE 3.20.1

Combined Log-Log Regression Analysis of Nominal Wool Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.18 and 3.11]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Yet when the independent variables are regressed individually, it becomes evident that it is unreasonable to argue that there was an inverse relationship between the weight of the English gold and silver currencies and the value of English wool—the coefficients of both become positive in Figure 3.20.2. For Scotland, the regression of individual independent variables only seeks to strengthen the conclusion that the debasement of the Scottish gold and silver currencies strongly contributed to the inflation of wool prices, for both accounted for over 60% of wool price fluctuations.

While it is clear that the role of debasement was consistently linked to the inflation of wine, cloth and wool in Scotland, this was not the case for England. The fact that wool

³⁶¹ It is quite probable that the Scottish domestic market was more resistant to payment by tale as a result of the extreme nature of Scottish debasement.

prices were more deflationary than cloth prices in England suggests that mercantile responses to English debasement cannot have been the only factor inflating the value of certain commodities. It thus seems entirely possible that the ‘value added’ in cloth and Port wine was at least partly accountable for the price inflation in England.³⁶²

	<i>England</i>				<i>Scotland</i>			
<i>d. Weight (silver)</i>	0.567*** (0.079)				-0.838*** (0.098)			
<i>d. Weight (gold)</i>	0.475*** (0.067)				-0.788*** (0.096)			
<i>Mint Output</i>	-0.014 (0.014)				0.012 (0.447)			
<i>Population</i>	0.738*** (0.171)				N/A			
<i>N</i>	180	180	180	180	28	28	7	N/A
<i>R</i> ²	0.2031	0.2007	0.0053	0.0988	0.6601	0.6234	0.0002	N/A

FIGURE 3.20.2

Individual Log-Log Regression Analysis of Nominal Wool Prices

[As Figures 2.5, 2.9, 2.12, 2.14, 2.18 and 3.11]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Though in England the importance of debasement appears to have been confined to the price trends of manufactured and traded goods, this is not true for Scotland, Flanders and Brabant. In these regions, the primacy of debasement as a driver of price trends remains evident for even the most basic of foodstuffs. For barley prices, the debasement of the silver currency was by far the most important independent variable for Scotland and the southern Low Countries. Figure 3.14.1 (above) shows that when the independent variables were used in a combined regression analysis, the weight of the silver penny was

³⁶² The changing value of labour in the post-Black Death period will be explored in detail in Chapter 4.

significant at the 1% level for both Scotland and Brabant. In Scotland, a 1% increase in the weight of the silver penny could have triggered a 1.189% decrease in Scottish barley prices; in Brabant the same percentage increase in a silver penny's weight could have caused a 0.428% decrease in Brabantine barley prices. These findings become even more apparent when the independent variables are regressed individually, Figure 3.14.2 (above). The weight of the silver currency accounted for an impressive 76.11% of barley price movements in Scotland, with a 1% increase in the currency's weight translating to a 1.189% decrease in barley prices. Though there was no statistically significant coefficient for Flanders in the combined regression, the individual regression shows that the weight of the silver currency accounted for 11.67% of Flemish barley price movements, with a 1% increase in the silver penny's weight possibly causing a 0.284% decrease in barley prices. In Brabant, the silver penny's weight was even more important than in Flanders, with it accounting for 54.49% of nominal barley price fluctuations. Here a 1% reinforcement in the penny's weight could have led to a 0.773% decrease in barley prices.

These conclusions are repeated in oat prices. The combined regression—Figure 3.13.1 (above)—demonstrates that there was still a very clear inverse relationship between the weight of the silver penny in Scotland and Brabant, and nominal oat prices. In the combined regression, a 1% increase in the silver penny's weight could have caused a 1.107% decrease in oat prices. In Brabant, a 1% increase in the weight of a silver penny might have translated to a 1.214% decrease in Brabantine oat prices. For both Scotland and Brabant, these coefficients are significant at the 1% level. Though there is also an inverse relationship between the Flemish silver currency's weight and nominal oat prices, the lack of

statistical significance makes it more difficult to draw conclusions with as much certainty. The individual regression of oat prices, Figure 3.13.2 (above), further solidifies these results. In Scotland, debasement of the silver currency accounted for 40.91% of nominal oat price fluctuations, with a 1% reinforcement of the currency equating to a 0.94% decrease in oat prices. In Brabant, the weight of the silver currency accounted for 50.80% of oat price fluctuations, while a 1% increase in the penny's silver content could have depressed oat prices by 0.683%. In both cases, these findings are significant at the 1% level. This was the case with the combined regression. Though there was a negative coefficient for the Flemish silver currency's debasement, indicating an inverse relationship between silver currency weight and oat prices, the results are weak and not statistically significant.

The comparison of the barley and oat regression analysis has shown that there was a consistent role for debasement in the determination of price trends. Yet the effect of debasement was not consistent for the two grains—for both Scotland and Brabant, the r^2 was stronger for barley than for oats. While the importance of debasement as a driver of general prices seems evident, one explanation for this difference between barley and oats could be that the origin of these basic foodstuffs affected their exposure to debasement-induced inflation; when supplies were sourced from outside the domestic market, there was a greater tendency for prices to react more reliably (i.e. have a stronger r^2) to changes in the weight of the currency. Barley, for example, was grown domestically in Scotland,

but there was also a market for imported barley from England, on account of it consistently fetching a higher price in Scotland than it did in England.³⁶³ There was a significant import trade in barley to the Low Countries, as it was needed for the brewing industry.³⁶⁴ Yet it was still produced domestically in the Low Countries: in Flanders, barley was commonly grown towards Ghent and in the coastal areas, and in Brabant it was grown in the wider countryside.³⁶⁵ Oats were grown domestically in England, Scotland, Flanders and Brabant. In contrast to barley, oats do not seem to have been as readily imported to Scotland and the Low Countries; there is only one example in the Gemmill and Mayhew price series of oats being imported, which is in marked contrast to wheat and barley.³⁶⁶ In the southern Low Countries, oats were the dominant grain, with some parts of Flanders and Brabant producing only oats.³⁶⁷ Furthermore, though it appears that essential commodities produced and traded entirely within the domestic market were less prone to debasement-induced inflation than essential goods sourced in part (or solely) from abroad, we have not seen this same strong r^2 result in wine [Figure 3.20.2], which suggests that luxury imported goods were less likely to reflect debasement patterns if their cost rose beyond the market's tolerance. In this instance, it is reasonable to assume that a fall in demand would have helped to depress prices.

³⁶³ Gemmill and Mayhew, *Changing Values*, pp. 161–3.

³⁶⁴ R. Unger, 'Medieval Ships and the Birth of Technological Societies', in C. Villain-Gandossi, S. Busuttill and P. Adam (eds), *Medieval Ships and the Birth of Technological Societies* (Malta, 1989), p. 129.

³⁶⁵ J. Dijkman, *Shaping Medieval Markets: The Organisation of Commodity Markets in Holland, c.1200–c.1450* (Leiden, 2011), p. 329; G. Astill and J. Langdon, *Medieval Farming and Technology: The Impact of Agricultural Change in Northwest Europe* (Leiden, 1997), pp. 95, 102.

³⁶⁶ Gemmill and Mayhew, *Changing Values*, pp. 188–9.

³⁶⁷ N. Pounds, *An Historical Geography of Medieval Europe, 450 B.C.–A.D. 1330* (Cambridge, 1973), p. 286; Nicholas, *Medieval Flanders*, p. 101.

The role of debasement was clearly very prominent for many Scottish, Flemish and Brabantine goods, and it played a crucial part in the price trends of English traded commodities. For Scotland, Flanders and Brabant, though the impact of debasement was clear across the general pattern of commodity prices—and especially so for essential foodstuffs that were imported—the role of debasement declined when the goods were sourced domestically, or when they were luxury imports.

Debasement, however, is only half the monetary story, and thus this section now turns to an examination of the impact of mint output on commodity price trends. It has been stressed that mint output cannot act as an infallible proxy for the money stock because it takes no account of accumulation, nor any instances of currency being lost from domestic circulation. Even though maintaining a background awareness of the outputs of gold and silver is crucial, for the regression analysis I have also left mint output as a combined figure of both gold and silver because the Scottish mint output data is too sparse. Splitting the Scottish data into gold and silver would dramatically reduce the number of observations on account of the instances where we have only data for one metal, and further weaken the statistical strength of the results. Despite these limitations, mint output is still useful for the sake of testing—albeit imperfectly—quantity theory, to gauge whether periods of particularly high or low mint output triggered inflationary or deflationary reactions in price trends.

In terms of gauging the short-term effect of mint output on commodity prices, the examination of the general trends of commodity prices in Section 3.1 has offered some preliminary conclusions. In England, it was common to see a brief period of deflation in

prices during the 1440s. This corresponds with the dip in both total and per capita mint output seen in this decade.³⁶⁸ It also supports—to an extent—the argument for a mid-fifteenth-century ‘slump’. However, the price depression lasted for just a decade, calling into question the severity and longevity of the slump, which Hatcher has placed from the 1440s to the 1470s.³⁶⁹ England’s mint output—both nominal and per capita—also increased in the late fifteenth and early sixteenth centuries, when the Central European silver mines were reopened and output was increased following technological innovation. This also corresponds with the general shift towards inflation from stagnation/deflation in most commodity prices, which took effect after the 1480s. There is also evidence of short- to medium-term price trends reflecting mint output in the Low Countries. In Flanders and Brabant, it was common to see commodity price deflation around the end of the fourteenth century, when mint output began to slump in the midst of the bullion famine. Likewise, a characteristic feature of Flemish and Brabantine commodity prices has been seen to have been a protracted era of deflation from the 1430s to the 1460s. This corresponds closely with the decline of mint output after Philip the Good’s monetary unification in 1433 signalled the start of a period of light-touch monetary policy. In these decades, the Burgundian monetary policy emulated that of England, where no debasements were carried out for a protracted period of time. The deflationary trough was only reversed by the resumption of debasement in the 1460s, which ushered in a fresh bout of

³⁶⁸ See Figures 2.11, 2.12, 2.22 and 2.23.

³⁶⁹ See Hatcher, ‘Great Slump’.

price inflation in the 1470s. As in England, the rising output of the Flemish and Brabantine mints in the late fifteenth and early sixteenth centuries also generally corresponded with price inflation. The patchy and inconsistent nature of the Scottish mint output data makes it difficult to be sure of causation when examining the short- to medium-term effects of mint output on prices. It does appear, however, that the high mint output in the 1360s and 1370s (which followed the initial debasement of the currency in 1367) did not cause corresponding price inflation. This was most likely because of mass-currency export to England for the payment of David II's ransom. This phenomenon appears to have been unique to the fourteenth century. Despite the paucity of Scottish mint output data, it is probable that there was a period of high black money output in the 1480s. This coincides with the extreme price inflation of the 1480s. However, the 1480s was a decade of particularly severe weather across Europe, and while some of the inflation might have been caused by the Scottish market being flooded with black money, we cannot disregard other factors. As we have seen in England and the Low Countries, there is also evidence of Scottish mint output rising in the late fifteenth and early sixteenth centuries. Similarly to the other regions, Scottish prices were also prone to inflation in this period.

It thus seems reasonable to suggest that the size of the mint output could well have affected commodity price trends in the short- to medium-term, if the change was dramatic enough. Measuring the long-term impact of mint output on price trends can again be done with regression analysis. If prices were rising as mint output increased, then we expect the coefficient to be positive. In England, regression analysis shows that in almost

all commodities—apart from herring, salt and wool—there is a positive relationship between English mint output and commodity prices. This relationship is often very weak, or not statistically significant, but it remains present nonetheless.

The role of mint output on English prices can be seen most clearly in the regression analysis of nominal salmon prices. In the combined regression [Figure 3.15.1 above], the independent variables explained 29.28% of salmon price fluctuations. Within that percentage, a 1% increase in mint output could have caused a 0.055% increase in prices. Likewise, the regression of individual independent variables [Figure 3.15.2 above] shows that mint output explained 16.74% of price trends, and could have inflated prices by 0.077% if mint output rose by 1%. In this case, mint output was second in its importance as a driver of salmon prices, only surpassed by population.

Similar conclusions can be found in the regression of nominal oat prices. Figure 3.13.1 (above) showed that, for England, the combined effect of the independent variables explains 45.94% of oat price fluctuations. A positive coefficient, significant at the 5% level suggests that a 1% increase in mint output might have triggered a 0.03% increase in oat prices. Likewise, Figure 3.13.1 showed that there was a positive coefficient for mint output and oat prices in both Flanders and Brabant. Though neither of the coefficients was statistically significant, they point to the suggestion that there was at least a possible causal relationship. These conclusions manifest themselves more clearly when the independent variables are regressed individually. Figure 3.13.2 (above) shows that mint output explains 6.06% of nominal English oat price fluctuations, while a 1% increase in mint output could have caused prices to rise by 0.054% (significant at the 1% level). In Brabant, mint output

explains 12.09% of Brabantine oat price fluctuations, and a 1% rise in mint output equates to a 0.11% rise in oat prices. For Flanders, the positive coefficient remains but the conclusions are weakened by a lack of statistical significance.

These same findings can also be seen in the regression of nominal cheese prices. Though the coefficients for mint output are positive, they lack statistical significance when they are used in a combined regression, Figure 3.21.1. When used in an individual regression, however, it is evident that the results are more statistically significant [Figure 3.21.2]. In England, mint output accounts for 3.22% of cheese price fluctuations, and a 1% rise in mint output could have caused a 0.026% rise in cheese prices. In Brabant, mint output explains 5.02% of nominal cheese price movements, and a 1% increase in mint output could have caused cheese prices to rise by 0.066%. For Flanders, the results hint at conclusions but are again less statistically conclusive. The r^2 is very weak, with mint output explaining just 0.87% of Flemish cheese price fluctuations.

	<i>England</i>	<i>Scotland</i>	<i>Flanders</i>	<i>Brabant</i>
<i>d. Weight (silver)</i>	-0.014 (0.106)	0.265 (0.257)	0.319** (0.129)	-0.789*** (0.127)
<i>Mint Output</i>	0.01 (0.001)	-0.088 (0.07)	0.011 (0.019)	-0.041 (0.025)
<i>Population</i>	0.0485*** (0.177)	N/A	-0.422 (0.458)	1.051** (0.436)
<i>N</i>	165	9	104	78
<i>R²</i>	0.0923	0.2324	0.1009	0.3544

FIGURE 3.21.1

Combined Log-Log Regression Analysis of Nominal Cheese Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.7]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

	<i>England</i>			<i>Scotland</i>			<i>Flanders</i>			<i>Brabant</i>		
<i>d. Weight (silver)</i>	0.049 (0.09)			-0.731*** (0.115)			0.105 (0.082)			-0.522*** (0.056)		
<i>Mint Output</i>	0.026*** (0.01)			-0.051 (0.05)			0.019 (0.016)			0.066** (0.032)		
<i>Population</i>	0.526*** (0.129)			N/A			-0.862* (0.463)			0.078 (0.456)		
<i>N</i>	165	165	165	24	9	N/A	150	123	131	146	82	142
<i>R</i> ²	0.026	0.0322	0.0878	0.5062	0.1053	N/A	0.0166	0.0087	0.0346	0.4260	0.0502	0.002

FIGURE 3.21.2

Individual Log-Log Regression Analysis of Nominal Cheese Prices

[As Figures 2.5, 2.12, 2.14, 2.16, 2.18, 2.21 and 3.7]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

It might well be the result of inconsistent or incomplete mint output data, but it appears that there are only a couple of examples where there is a positive relationship between Scottish mint output and Scottish price trends—more common is a negative coefficient for mint output. Only salmon and wool prices have a positive relationship to Scottish mint output. In the case of wool [Figure 3.20.2 above], the stronger of the two, the r^2 for the individual regression shows that mint output accounted for only 0.0002% of wool price fluctuations, and that a 1% rise in mint output likely translated into only a 0.012% increase in Scottish wool prices. For salmon, the results are weaker still [Figure 3.15.2 above]: the r^2 shows that the explanatory power of mint output was so weak it was not visible to four decimal places, with the statistical software returning a result of 0.0000. The coefficient is almost as weak, with a 1% rise in Scottish mint output equating to just a 0.0002% rise in nominal Scottish salmon prices. In all other commodity regression analyses, we are presented with a negative coefficient of varying strengths and statistical significance for Scottish mint output.

The general impression given by the regression analysis of various commodities shows that in England, mint output is, more often than not, positively correlated to price inflation. It is common for the r^2 to be very low, and for the coefficient to be quite weak, but the importance of mint output is clearly there in the background. The same is true for Brabant, where there was always a positive coefficient. For Flanders, it is more difficult to discern a statistical link between mint output and price inflation. While a positive coefficient is present in the regression analysis of oats and cheese, these are the only two examples where this is the case. For Scotland, similar results have presented themselves—

only for wool and salmon prices did mint output have a positive coefficient. It is possible that mint output really was less significant for Flanders and Scotland, or it might be a flaw in the data—or its use—that has led us to these conclusions.

It has repeatedly been stressed that mint output can only act as an imperfect proxy for the money stock. But there are further problems with considering the role of the money stock as a whole in the determination of general price trends. The Fisher Identity's failure to differentiate between gold and silver M means that we are forced to consider the money stock as a combination of gold and silver denominations when, in reality, it has been emphasised that they served different purposes within the economy.³⁷⁰ If we assume that silver was more essential for the fluidity of the domestic market, then should the mint produce predominantly gold currency, it would be possible to see prices fall while total mint output increased. Likewise, by not differentiating between gold and silver, M does not allow for a distinction between different denominations.

This is problematic because, while Chapter 2 showed that there was probably a good amount of money *per capita* coming out of the English mints, there is a great deal of evidence to suggest that England suffered from a chronic shortage of small change throughout the late medieval period.³⁷¹ This was almost certainly the result of England taking a unique approach to the management of a bimetallic, multi-denominational currency. England, unlike Scotland and the Burgundian Netherlands, did not commonly lower the intrinsic value of silver small change relative to larger silver denominations. England also

³⁷⁰ See Section 2.1.2.

³⁷¹ See Section 2.2.

did not issue token small change. Indeed, by maintaining a proportional relationship between its petty and larger silver denominations, England kept the relative cost of producing petty coins high, which discouraged both the mint and mint customers from converting bullion into small change. The need to incentivise mint-goers to convert their bullion to small change was crucial because a great deal of those bringing bullion to the mint would have been merchants, and those involved in trade, rather than ordinary peasants.³⁷² Conducting trade with small change could have been impractical because transporting masses of coins would have been costly and inconvenient.³⁷³

The problem of small change manifested itself in the fourteenth century, when an exclusive debasement of the farthings and halfpennies was initiated in August 1335. The halfpennies were reduced by 3.6% and the farthings by 5.36%.³⁷⁴ However, this did not mark a new sustained output of small change, for Allen notes that the production of halfpennies and farthings was suspended between May 1335 and December 1343, and again between 1351 and 1355.³⁷⁵

In October 1362, Edward III's parliament heard that they needed to strike more quarter nobles,³⁷⁶ but by January 1394 the problem appears to have become more specific to silver. Richard II's parliament was told that there was a 'great scarcity in the realm of halfpennies and farthings', with the result that people were unable to get change for their

³⁷² Munro, 'Deflation and the Petty Coinage', p. 404.

³⁷³ Spufford, *Money and Its Use*, p. 271; Pounds, *Economic History*, p. 430. Even though a lot of trade was tied up in bills of exchange, settlement was still eventually required. For a description and worked example of how bills of exchange functioned, see Pounds, *Economic History*, pp. 415–20.

³⁷⁴ Derived from the figures given in Allen, *Mints and Money*, p. 154.

³⁷⁵ *Ibid.*, p. 82, 176.

³⁷⁶ *PROME*, ii, 271.

purchases costing less than a penny.³⁷⁷ The king's solution was to order that the mints strike halfpennies and farthings, and he also stated that it was now illegal to melt down pennies, halfpennies and farthings.³⁷⁸ The king also banned the circulation of Scottish money in England, and forbade Englishmen changing their money for Scottish coins.³⁷⁹ In September 1402 Henry IV's parliament was told that the shortage of small change had not improved. The English had continued to use debased foreign coins to keep low-level domestic transactions flowing.³⁸⁰ The Commons was told that this was to the detriment of English money because it would push out the higher quality coin, indicating an early understanding of the principles of Gresham's Law.³⁸¹ Though the king's solution was to order that a third of the silver brought to the melting house should be made into halfpennies and farthings,³⁸² the problem did not improve. In 1404 the Commons heard that there was a problem with counterfeiting gold and silver coins,³⁸³ and in 1415 there were more complaints that debased Scottish coins were used to partly address the void of native small change.³⁸⁴ By 1423, not only did the issue with Scottish money remain, but there

³⁷⁷ *Ibid.*, iii, 319.

³⁷⁸ Groats were excluded from this ban, suggesting that the issue was specifically with small change.

³⁷⁹ *PROME*, iii, 320.

³⁸⁰ Indeed, the parliament of January 1401 had also found that there were issues with Flemish, Scottish and other foreign coin coming into England. *Ibid.*, iii, 470. From 1400 there was also a good number of Venetian galley-halfpence in circulation. These were about the same size as an English halfpenny, but 'of a considerably worse alloy'. They were only firmly banned after Easter 1416, and the reluctant tolerance of them up to this point suggests that the issue of small change had become significant. P. Spufford, 'Continental Coins in Late Medieval England', *BNJ*, Vol. 32 (1963), pp. 132–6.

³⁸¹ *PROME*, iii, 498.

³⁸² *Ibid.*, iii, 498.

³⁸³ *Ibid.*, iii, 540.

³⁸⁴ *Ibid.*, iv, 69.

was also circulation of ‘blanks’—token coins of no intrinsic value.³⁸⁵ Despite the number of measures taken by parliament, such as ordering that a certain quantity of small change be churned out by the mint,³⁸⁶ the parliament of 1445 heard that there was still a shortage of halfpennies and farthings. As had been the case in 1394, people wishing to buy goods of a value below a penny had to accept that they might not receive change.³⁸⁷ In 1447, it was agreed that the mints would issue lighter halfpennies. They were reduced in weight from 7.5 grains to 6.8 grains, a reduction of 9.3%.³⁸⁸ Following the 1447 halfpenny debasement, there seems to have been far fewer complaints of a lack of small change, and of foreign coin coming into circulation. However, the problem of small change still persisted to an extent into the 1470s and beyond because there were more reiterations in parliament that halfpennies and farthings should not be melted down.³⁸⁹

This evidence speaks of a probable lack of small change in England, which was an issue that persisted for most of the fourteenth and fifteenth centuries. The quantification of the amount of small change in circulation is impossible because the mint records do not give denominational breakdowns for most of the late medieval period, but we must consider the possibility that, while there was only a weak positive relationship between

³⁸⁵ *Ibid.*, iv, 255. Allen suggests that these blanks were Anglo-Gallic and French *blancs* ‘and probably also billon coins of broadly similar weight and fineness from France’. Allen, *Mints and Money*, p. 364.

³⁸⁶ Allen, ‘Proportions of the Denominations’, p. 193.

³⁸⁷ *PROME*, te, v, 108. Incidentally, this emphasises that credit could only expand the money stock in communities where there was sufficient trust between individuals. Thus, travellers were disadvantaged as they did not have the means to run up debt caused by insufficient small change.

³⁸⁸ Allen, *Mints and Money*, p. 154; M. Allen, ‘Currency Depreciation and Debasement in Medieval Europe’, in D. Fox and W. Ernst (eds), *Money in the Western Legal Tradition: Middle Ages to Bretton Woods* (Oxford, 2016), p. 44.

³⁸⁹ *PROME*, vi, 184.

the lower total mint output in the fifteenth century and price stagnation/deflation, the long-term price trends could have been more strongly linked to a chronic lack of small change than to the combined gold and silver M has suggested.

This section has shown that debasement was a particularly important driver of commodity prices in Scotland, Flanders and Brabant, especially in the case of imported goods with inelastic demand. For England, commodity prices only tended to reflect debasement when the goods were heavily involved in trade. An examination of the impact of mint output on commodity prices has suggested that there was a weak positive relationship between English mint output and commodity prices. The same was found for Brabant. However, the results were inconclusive for Flanders and Scotland, where there was a far weaker, and even inverse, relationship between mint output and price trends. Clearly mint output cannot fairly test Quantity Theory, nor can Quantity Theory fairly take account of denominational shortages. It is so far clear, however, that while the size of the population has proved to be the most important determinant of prices in England, the quality and quantity of the money in circulation *did* matter—especially for Brabant, Flanders and Scotland. It is almost certainly the case that the relative stability of English currency was what enabled the sluggish population recovery after the Black Death to play such a prominent role in long-term price trends. By the same measure, the aggressive debasement policies in the Low Countries appear to have offset the impact of population recovery. Thus, looking at England's post-Black Death economic experience cannot tell the economic historian what to expect in *all* post-Black Death economies—it tells them what to expect in a post-Black Death economy with an unusually stable coinage. Yet we

cannot escape from the reality that neither demographic nor monetary factors can entirely account for the entirety of price trends in England, Scotland, Flanders and Brabant. We must therefore cast the net wider still.

3.2.3 CLIMATE AND CROP YIELDS

While the role of fluctuating population, debasement and mint output levels have been demonstrated and discussed in the previous two sections, the impact of weather and harvest performance has not. Thus, it is now necessary to set out the general climate patterns of late medieval north-western Europe and examine their impact on commodity price trends. There are four potential sources of data which can be used to produce a quantitative long-term measure of the impact of climate on grain prices. The first is the recent work by Kathleen Pribyl, which has offered a year-on-year estimate of summer temperatures and precipitation levels in late medieval England.³⁹⁰ The second is the work of A. V. F. van Engelen, J. Buisman and F. Ijnsen, who have produced annualised data of weather fluctuations in the Low Countries spanning from 751 AD to 2000 AD.³⁹¹ The third option is the long-run temperature estimates for Europe in the work of Guiot *et al.*, which combines a number of other climate studies to create an overview of amalgamated climate

³⁹⁰ K. Pribyl, *Farming, Famine and Plague: The Impact of Climate in Late Medieval England* (New York, 2017). See also the earlier work by K. Pribyl, R. C. Cornes and C. Pfister, 'Reconstructing Medieval April-July Mean Temperatures in East Anglia, 1256–1431', *Climatic Change*, Vol. 113, No. 2, (2012), pp. 393–412.

³⁹¹ A. V. F. van Engelen, J. Buisman and F. Ijnsen, 'A Millennium of Weather, Winds and Water in the Low Countries', in P. D. Jones, A. E. J. Ogilvie, T. D. Davies and K. R. Briffa (eds), *History and Climate: Memories of the Future?* (New York, 2001), pp. 101–24.

data.³⁹² The fourth option is to use crop yield data produced by Bruce Campbell.³⁹³ These datasets have individual merits and flaws. The work of Pribyl *et al.* is particularly impressive, constructing annual temperature estimates by drawing upon about 1,000 manorial accounts from Norfolk where the authors were able to find 616 indications of when grain harvest began between the years of 1265 and 1431.³⁹⁴ This data is repeated in Pribyl's *Farming, Famine and Plague*, where she deploys it to examine the (predominantly) short term impact of extreme weather shocks (of both precipitation and temperature) on grain prices.³⁹⁵ However, her data is unsuitable for inclusion in my regression model because it falls significantly short of my time period's span, leaving 100 years without data (from the 1430s to 1530).

Van Engelen, Buisman and Ijnsen's work on the construction of a weather series for the Low Countries spans a much wider time period than Pribyl's dataset, though there are potential problems with the data relating to the medieval period. While the observations after 1700 are able to draw on scientific instrumental observational data, the climate figures before this period are drawn from diary entries, mill accounts, chronicles, annals and toll accounts. The authors have examined these qualitative sources and assigned a value to each description of weather, based on the thermal aspect, duration and intensity of climate events, where these factors contribute to a points-based system used to give a

³⁹² J. Guiot, A. Nicault, C. Rathgeber, J. L. Edouard, F. Guibal, G. Pichard. and C. Till, 'Last-Millennium Summer-Temperature Variations in Western Europe Based on Proxy Data', *The Holocene*, Vol. 15, No. 4 (2005), pp. 489–500.

³⁹³ Campbell, 'Three Centuries of English Crop Yields' (4 February 2018).

³⁹⁴ Pribyl, Cornes and Pfister, 'Reconstructing Medieval April-July Mean Temperatures', pp. 394–8.

³⁹⁵ Pribyl, *Farming, Famine and Plague*, pp. 187–98.

final weather ‘score’ for each year.³⁹⁶ The results produced by the authors are extremely impressive, though the qualitative nature of their underlying sources makes the dataset unsuitable for inclusion within a regression model where the other variables are derived from quantitative sources. This is because, while the overall trend of weather patterns in the Low Countries offered by the authors is most likely generally accurate, the nature of the methodology jeopardises statistical significance in the regression results because it is not possible to place the same level of confidence in the *absolute* values assigned to weather events as we can for the quoted price of grain. Indeed, given their climate figures for my period range from 1–8, and use integers only, any change in year-on-year weather at all—no matter how slight—will be reflected in the data as a minimum of a 12.5% shift in temperature.³⁹⁷ This can lead to dramatic overstatements of climate fluctuations, and with a minimum unit change of 12.5%, it is clear that the data is entirely unsuitable for comparison with price data, where shifts could be as small as 0.1% if prices moved by a quarter penny.

The problems with van Engelen *et al.*'s and Pribyl's datasets are remedied in Guiot *et al.*, whose analysis of historic temperatures in Europe based on dendrochronology, Chuine *et al.*'s grape harvest data,³⁹⁸ ice core data, and qualitative sources, spans from the

³⁹⁶ van Engelen, Buisman and Ijnsen, 'A Millennium of Weather', pp. 102–8.

³⁹⁷ It is important to note that the data on p. 114 of their article, which shows non-integers, is the result of the annual data on pp. 109–13 being averaged into 25-year means, rather than being a separate dataset of more precise weather estimates.

³⁹⁸ The original work on grape harvest data (another avenue I explored for gaining a climate proxy) can be found in I. Chuine, P. Yiou, N. Viovy, B. Seguin, V. Daux and E. Le Roy Ladurie, 'Historical Phenology: Grape Ripening as a Past Climate Indicator', *Nature*, Vol. 432 (2004), pp. 289–290.

700s to the modern period.³⁹⁹ The data is given with reference to the base period (1961–1990), and is able to show more precise fluctuations than seen in van Engelen *et al.*, while covering a far greater period than Pribyl’s data. Thus, it is theoretically possible to incorporate Guiot *et al.*’s data into my regression model and test the impact of climate on grain prices. However, there is an issue with doing this: not all grains reacted to weather in the same way. Indeed, it is common knowledge that wheat can tolerate heat and dryness more than oats and barley can, while oats and barley are able to cope with higher levels of precipitation and lower temperatures.⁴⁰⁰ This would suggest that to test the impact of climate on wheat, oat and barley prices, we would simply look for a positive correlation between temperature and wheat, and a negative correlation between temperature and barley/oats. Yet it is not as simple as that. Of course, while wheat might tolerate higher temperatures better than other grains can, there will come a point when the temperature rises beyond the tolerance of the plant. Likewise, oats and barley can still suffer if temperatures fall dramatically. Consequently, we would expect for there to be little evidence of a linear relationship between temperature and grain prices. Indeed, I found this to be the case when I ran test regressions on Pribyl’s and Guiot *et al.*’s data against grain prices:

³⁹⁹ Guiot *et al.*, ‘Last-Millennium Summer-Temperature Variations’, p. 496. Compared with Pribyl’s data, that of Guiot *et al.* is far more comprehensive because it seems to draw on all known sources of climate estimates, though there is no data for Scotland. The reliability of Guiot *et al.*’s climate data must be held in high esteem on account of the breadth of the sources included, especially with regards to dendrochronology. The dendrochronological data included in Guiot *et al.*’s climate estimates incorporate data from trees which are known to be the best indicators of historic temperature—including the European larch, the Swiss pine and the Norway spruce. My thanks to Dr Guiot for his advice on climate reconstruction and for allowing me access to his dataset. I am also grateful to Professor Michael Baillie for his advice regarding dendrochronology as a means of gauging historic climate fluctuations, especially with regard to tree species.

⁴⁰⁰ See Pribyl, *Farming, Famine and Plague*, pp. 95–141, for a detailed discussion of various temperature shocks on different agricultural produce.

in no case was there statistical significance—not even to the 10% level—and correlations were very close to 0.⁴⁰¹ Thus, counterintuitively, estimates of historic temperature do not provide a suitable means to test for a linear relationship between climate and grain prices.

Therefore, we must turn to the fourth option of quantitatively measuring climate's impact on grain prices: crop yields. Campbell's crop yield data spans from the early thirteenth century to the end of the fifteenth century, and his figures are taken from manorial records.⁴⁰² Though crop yields appear to be a more indirect measure of weather than the datasets provided by Pribyl, and by van Engelen, Buisman and Ijnsen, they provide the best current means of quantitatively measuring the impact of long-term climate trends on long-term grain prices. While crop yields were also subject to the influence of other factors such as labour input, soil quality and rotation, Campbell notes that 'few agencies had greater influence upon yields than the weather; of all the key agricultural inputs, it was the one over which producers had least control'.⁴⁰³ Because crop yield data is available for each individual grain, it allows us to get a general impression of climate trends and its direct impact on each particular grain, something which straight temperature figures

⁴⁰¹ Using the temperature data available in Pribyl, when I attempted to run coefficient tests against the prices of wheat, barley and oats in England, the r^2 in all three cases fell below 4%, and none of the results were statistically significant—that is to say, where we have wanted results to be significant to *at least* the 10% level for other regressions, these all fell well below that mark, with the worst being wheat which was significant only to the 90% level! I believe that the weak results are due to the straight temperature estimates making no allowance for a tailored effect on each individual grain. This is presumably why Pribyl uses her data for comparison against wheat prices in *specific* years rather than in the long-term sense as I seek to do in this thesis. See Pribyl, *Farming, Famine and Plague*, pp. 187–98. The results were similar when I ran the same tests on the Guiot *et al.* data.

⁴⁰² Campbell, 'Three Centuries of English Crop Yields' (4 February 2018).

⁴⁰³ B. M. S. Campbell, 'Grain Yields on English Demesnes After the Black Death', in M. Bailey and S. H. Rigby (eds), *Town and Countryside in the Age of the Black Death: Essays in Honour of John Hatcher* (Turnhout, 2012), pp. 122–4, 159.

would not have allowed. This is particularly useful when we remember that some grains were more tolerant to heat than others—wheat would fare better than oats and barley, but in years of cold and damp, wheat would suffer most. Therefore, by utilising crop yield data, we can measure some of the direct impact of climate on each particular grain against that grain's respective price trend. With this in mind, we must therefore consider that crop yields provide the best proxy for medieval climate trends in cases such as this, where the intention is to examine the long-term impact of weather on long-term grain prices.

Indeed, we can clearly see the extent to which climate patterns were linked to crop yields by comparing Campbell's data with known periods of poor weather in England. Where weather was especially poor, we would expect grain yields to fall. Figure 3.22 shows that in the period after 1350, yields were declining until about 1370. This coincides with the *general* trend of declining temperatures shown in Pribyl's data for English summer temperatures.⁴⁰⁴ This is also consistent with Guiot *et al.*, whose data shows a general decline in temperature from the middle of the fourteenth century.⁴⁰⁵ Thereafter, crop yields improved until they reached their zenith around 1390–1400. This matches with Pribyl's precipitation estimates, where they are at their most stable and remain fairly consistently close to zero between the late 1380 and early 1400s. Likewise, Pribyl's estimates suggest that temperatures were slightly warmer in this same period, as does the data of Guiot *et al.* Warm weather and drier soil would have been particularly beneficial to wheat yields.⁴⁰⁶

⁴⁰⁴ Pribyl, *Farming, Famine and Plague*, p. 274.

⁴⁰⁵ Guiot *et al.*, 'Last-Millennium Summer-Temperature Variations', p. 496.

⁴⁰⁶ Pribyl, *Farming, Famine and Plague*, pp. 137, 274, 275; Guiot *et al.*, 'Last-Millennium Summer-Temperature Variations', p. 496.

This suggests that weather was particularly poor in the period from the 1350s to the 1370s, but improved towards the end of the century. However, grain yields declined throughout the fifteenth century. In this period, though Pribyl's data no longer aids us, the 1430s, 1450s and the 1480s have been identified as decades of particularly poor weather, which is confirmed in Guiot *et al.*'s data.⁴⁰⁷ This is replicated in Campbell's crop yield data, where yields fell to lower levels in these decades, further suggesting that crop yields act as a reasonable indicator of climate.⁴⁰⁸ The poor weather in the 1480s had come in the form of severe flooding, the same horrendous flooding that caused the River Severn to burst its banks during the Duke of Buckingham's rebellion against Richard III in October 1483.⁴⁰⁹ Hoskins has offered a detailed study of harvest fluctuations for the period 1480–1619, allowing us to go beyond the scope of Campbell's work.⁴¹⁰ Particularly bad harvests occurred in 1438, 1481–3, 1500–3, 1519–21 and 1527–9; otherwise, harvests were generally at least 10% better than average.⁴¹¹

⁴⁰⁷ Guiot, *et al.*, 'Last-Millennium Summer-Temperature Variations', p. 496.

⁴⁰⁸ C. J. Harrison, 'Grain Price Analysis and Harvest Qualities, 1465–1634', *Agricultural History Review*, Vol. 19, No. 2 (1971); J. S. Lee, 'Grain Shortages in Late Medieval Towns', in B. Dodds and C. Liddy (eds), *Commercial Activity, Markets and Entrepreneurs in the Middle Ages: Essays in Honour of Richard Britnell* (Woodbridge, 2011), p. 64; A. J. Pollard, *North-Eastern England During the Wars of the Roses: Lay Society, War and Politics, 1450–1500* (Oxford, 1990), pp. 78–80; W. G. Hoskins, 'Harvest Fluctuations and English Economic History, 1480–1619', *Agricultural History Review*, Vol. 12, No. 1 (1964), pp. 28–46; A. T. Brown, *Rural Society and Economic Change in County Durham: Recession and Recovery, c.1400–1640* (Woodbridge, 2015), pp. 48–51; N. R. Amor, *Late Medieval Ipswich: Trade and Industry* (Woodbridge, 2011), p. 191; C. Dyer, 'Poverty and Its Relief in Late Medieval England', *Past and Present*, Vol. 216, No. 1 (2012), p. 63.

⁴⁰⁹ The flooding was so severe that it left Buckingham stranded and ultimately contributed to the failure of his plot. L. Gill, *Richard III and Buckingham's Rebellion* (Stroud, 1999), p. 74; A. Corbet, *Edward IV, England's Forgotten Warrior King: His Life, His People, and His Legacy* (Indiana, 2015), p. 128.

⁴¹⁰ Hoskins, 'Harvest Fluctuations'.

⁴¹¹ *Ibid.*, p. 39.

FIGURE 3.22

[Campbell, 'Three Centuries of English Crop Yields' (4 February 2018).]

It thus appears that there was a good degree of relation between climate in England and crop yields. But to what extent can we use Campbell's grain yields as a proxy for fluctuations in climate in Scotland and the southern Low Countries? Though it was stated in Chapter 1 that I have selected Scotland, Flanders and Brabant partly because their geographical proximity should help to eliminate weather variations, I also made the point that most historiography has tended to be Anglocentric. Thus, it is necessary to demonstrate that these other countries also experienced bad weather in the above periods. Certainly, the experts on climatology tend to treat western Europe as one homogenous entity when it comes to examining the long-term trends of climate.⁴¹² We can see the validity

⁴¹² See, for example, Guiot *et al.*, 'Last-Millennium Summer-Temperature Variations', pp. 489–500; I. García de Cortázar-Atauri, V. Daux, E. Garnier, P. Yiou, N. Viovy, B. Seguin, J. M. Boursiquot, A. K. Parker, C. van Leeuwen and I. Chuine, 'Climate Reconstructions from Grape Harvest Dates: Methodology and Uncertainties', *The Holocene*, Vol. 20, No. 4 (2010), pp. 599–608.

behind such treatment when we examine and compare information suggestive of weather patterns. In his study of crop yields, Campbell utilises the data for Low Countries climate fluctuations produced by van Engelen, Buisman and Ijnsen and notes that the trends shown in their data largely reflects the overview of climate trends implied by his English crop yield data.⁴⁴³ This overarching conclusion is confirmed on a more micro level: van der Wee's survey of the climate around Antwerp seems to confirm that weather was bad in the 1360s, though noting that there were fewer complaints up to 1400.⁴⁴⁴ Flooding is recorded in 1431, and the winters of 1432–3, 1434–5, 1436–7 and 1438–9 were particularly cold and severe. Likewise, 1483 and 1484 suffered from summer flooding and heavy rain. There was also poor weather throughout the 1520s.⁴⁴⁵

There is no climate data to this same degree of detail for Scotland,⁴⁴⁶ but Gemmill and Mayhew remarked that wheat and barley yields in the 1980s were broadly equal to those in England, and anecdotal evidence from medieval Scotland suggests that 'anticipated yields of Scots barley were very much in line with those expected in England'.⁴⁴⁷ There is also enough scattered data to suggest that the weather *largely* mirrored the trends seen in England and the Low Countries.⁴⁴⁸ Indeed, weather was extremely cold in 1355–6, and

⁴⁴³ Campbell, 'Grain Yields', pp. 144–5, 148, 154.

⁴⁴⁴ I consider Antwerp's weather trends to be generally representative of both Flanders and Brabant because it sat on the border between the two regions. The small size of both also reduces the likelihood that they would have experienced radically different weather patterns.

⁴⁴⁵ Van der Wee, *Growth of the Antwerp Market*, i, pp. 550–7.

⁴⁴⁶ And indeed, it was entirely absent from Guiot *et al.*'s dataset.

⁴⁴⁷ Gemmill and Mayhew, *Changing Values*, pp. 145, 163.

⁴⁴⁸ The time constraints and word limit have prevented me from attempting to build a similar crop yields time series for Scotland and the southern Low Countries. In an ideal world, I would have preferred to adjust for the slightly cooler temperature in Scotland.

generally wet in the 1350s and 1360s, which was in keeping with the known cold weather elsewhere.⁴¹⁹ Campbell's examination of speleothem band widths has also demonstrated that there was heavier rainfall in the mid 1350s and early 1360s in Scotland.⁴²⁰ Richard Oram's work on Scotland has also suggested that Scotland, like England and the Low Countries, appeared to enjoy a slight recovery in temperatures in the final few decades of the fourteenth century, before temperatures again fell in the fifteenth century.⁴²¹ Thus, the fifteenth century was far more prone to snow, with easterly winds frequently blowing off the European continent and into Scotland.⁴²² There was famine in 1429, and then a decade of very severe winters (when wine had to be melted by the fire before it could be drunk) leading to famines in 1433, 1434–5, 1437–8 and 1440. And although the middle of the century seems to have been milder, there were more exceptionally cold winters in the 1460s and late 1470s.⁴²³ As for the 1480s, T. C. Smout has suggested that Scotland again suffered from poor harvests, which seems likely given that the bad weather extended to the Low Countries—and indeed is corroborated by the statement in the poem, 'The Harp', from the later 1480s, that there was then a 'grete scantness of fude'.⁴²⁴ Next, heavy

⁴¹⁹ Campbell, *Great Transition*, pp. 279, 280.

⁴²⁰ *Ibid.*, p. 280.

⁴²¹ R. Oram, "'The Worst Disaster Suffered by the People of Scotland in Recorded History": Climate Change, Dearth and Pathogens in the Long 14th Century', *Proceedings of the Society of Antiquaries of Scotland*, Vol. 144 (2014), pp. 227–8.

⁴²² Dawson, *So Foul and Fair a Day*, p. 105.

⁴²³ R. Nicholson, *Scotland: The Later Middle Ages* (Edinburgh, 1974), p. 320; C. Walford, 'The Famines of the World: Past and Present', *Journal of the Statistical Society of London*, Vol. 41, No. 3 (1878), p. 440; Dawson, *So Foul and Fair a Day*, pp. 105–6; C. Camenisch *et al.*, 'The 1430s: A Cold Period of Extraordinary Internal Climate Variability during the Early Spörer Minimum with Social and Economic Impacts in North-Western and Central Europe', *Climate of the Past*, Vol. 12, No. 11 (2016), pp. 2110–11.

⁴²⁴ Dawson, *So Foul and Fair a Day*, p. 106; T. C. Smout, *Scotland and the Sea* (Edinburgh, 1992), pp. 49–50; *Book of Pluscarden*, i, p. 397.

rains damaged harvests in the summers and autumns of 1491, 1501 and 1505; and finally (with respect to this study) summer rains struck again in 1523, and autumn rains damaged the harvests in 1525.⁴²⁵

Given that the evidence from the southern Low Countries and Scotland appears to support the general impression of climate given by Campbell's crop yield data, it seems possible to use the English crop yield data as a basic and imperfect proxy for weather patterns in England, Scotland and the southern Low Countries. This will enable us to add a long-term climate independent variable to the regression analysis employed later in this section.

To ensure that the regression analysis is interpreted with precision, it is also necessary to consider the differing levels of crop robustness and demand elasticity: the hardier the crop, the more resistant to poor weather its yield; the higher the demand pressure, the more a crop failure can be expected to have inflated prices. Therefore, the next three paragraphs look at demand for the main grains, and whence they were sourced.

Wheat was an extremely important grain for north-western medieval Europe because of its role in bread-making after the Black Death, once improved living standards allowed people to consume more expensive foods.⁴²⁶ Even in Scotland, where oats were the primary grain, wheat became increasingly significant as a bread grain.⁴²⁷ Wheat was one of the most difficult crops to produce, with it performing poorly on low-quality soil and

⁴²⁵ Dawson, *So Foul and Fair a Day*, p. 106.

⁴²⁶ Pounds, *Economic History*, pp. 395–6; M. W. Adamson, *Food in Medieval Times* (Westport, 2004), pp. 2–3; C. Dyer, *Everyday Life in Medieval England* (London, 2000), p. 91.

⁴²⁷ Gemmill and Mayhew, *Changing Values*, pp. 30–42.

being particularly vulnerable to cold.⁴²⁸ It was sown in autumn, and was thus exposed to climate shocks for up to ten months a year.⁴²⁹ In England, its popularity increased at the expense of rye, another grain used in the production of bread, though rye bread was generally much cheaper.⁴³⁰ By 1300, Kent had been exporting significant quantities of wheat, with active merchants from Picardy and Flanders (especially Ghent) participating in the English grain trade.⁴³¹ It is quite likely that a good amount of wheat in Scotland was actually imported from England—its high value made it an attractive commodity for trade, as it was still profitable (when shipped in bulk), even after transport costs and other overheads had been factored in.⁴³² The English were clearly able to produce a surplus of wheat, as indicated by the wheat export trade, which ran as a bolt-on to the fish trade; and London fishmongers also shipped grain from Great Yarmouth and King's Lynn to Holland.⁴³³

In Flanders, rye was the main grain grown in winter and oats were the main summer grain. According to Nicholas, 'wheat was scarcely ever grown alone'.⁴³⁴ Wheat was also

⁴²⁸ Pounds, *Economic History*, p. 190.

⁴²⁹ B. M. S. Campbell and C. Ó Gráda, 'Harvest Shortfalls, Grain Prices, and Famines in Preindustrial England', *The Journal of Economic History*, Vol. 71, No. 4 (2011), p. 863.

⁴³⁰ Adamson, *Food*, pp. 2–3, 91.

⁴³¹ J. A. Galloway, 'London's Grain Supply: Changes in Production, Distribution and Consumption During the Fourteenth Century', *Franco-British Studies*, Vol. 20 (1995), pp. 29–33.

⁴³² Gemmill and Mayhew, *Changing Values*, p. 145. Wheat transport by land in England added about 0.25% per kilometre, but transport by water added just 0.1% per kilometre. See Dijkman, *Shaping Medieval Markets*, p. 285. For more on the wheat trade, see Miller and Hatcher, *Medieval England*, pp. 208–9.

⁴³³ N. J. M. Kerling, *Commercial Relations of Holland and Zeeland with England from the Late 13th Century to the Close of the Middle Ages* (Leiden, 1954), p. 108; Dijkman, *Shaping Medieval Markets*, pp. 308–10, 400.

⁴³⁴ Nicholas, *Medieval Flanders*, p. 125.

grown in northern France (whence it was imported to Flanders), and in the Scheldt regions of Flanders.⁴³⁵ In Brabant, wheat was only introduced at the start of the sixteenth century at the Infirmary of the *Grand Béguinage* in Louvain, but it became a regularly sown crop thereafter.⁴³⁶ Wheat was grown in the Scottish Lowlands,⁴³⁷ where possible—though, as on the Infirmary’s land in Louvain, it was probably not grown to the same extent as the tougher grains: oats, rye and barley. Thus, it is likely that the demand for wheat in Scotland and the Low Countries was more elastic than in England, and was more dependent on imports from abroad.

The demand for barley, however, was fairly inelastic because of its use as an important ingredient in ale-making.⁴³⁸ It was thus a substantial part of diets in England, Scotland and the southern Low Countries. As stated above, barley was produced domestically in Scotland, England, Flanders and Brabant, though it was imported when supplies fell short of demand.⁴³⁹ Barley was sown in spring and was a hardier crop than wheat, but more vulnerable than oats.⁴⁴⁰

Oats were one of the toughest crops, as their ubiquity in Scottish arable farming indicates. As they were sown in spring, if the autumn-sown wheat crops failed, oats could be planted on the same land to avoid a complete harvest crisis. This was not an option

⁴³⁵ *Ibid.*, p. 101. This conservative approach to wheat-growing in the southern Low Countries might have been the result of a general European approach: Pounds stated that, ‘wheat was grown only on restricted areas in western and central Europe’. See Pounds, *Historical Geography*, p. 285.

⁴³⁶ Tits-Dieuaide, ‘Cereal Yields Around Louvain’, p. 98. Rye, barley and oats had been far more popular on the Infirmary’s land before this point.

⁴³⁷ Gemmill and Mayhew, *Changing Values*, p. 148.

⁴³⁸ R. W. Unger, *Beer in the Middle Ages and the Renaissance* (Philadelphia, 2004), p. 186.

⁴³⁹ See above, p. 179.

⁴⁴⁰ Pounds, *Historical Geography*, pp. 285-6.

that existed for barley, on account of its being a late winter-sown crop.⁴⁴¹ In England, the very poorest of people would have consumed cheaper grains like oats. According to *Piers Plowman*, poor widows kept themselves and their children with what little money they had on a diet of milk and oatmeal (after paying rent).⁴⁴² Apart from feeding the very poorest inhabitants, and making up a shortfall in food during times of poor harvest,⁴⁴³ oats in London were mainly used to feed the many horses that served the city. In sharp contrast, oats in Scotland were not the preserve of the poor, but formed a large part of the medieval Scottish diet.⁴⁴⁴ Oats were also an important part of the diet of those living in the Low Countries. At least since the High Middle Ages, oats were the main grain crop grown in Western Flanders.⁴⁴⁵ The greater popularity of oats in Scotland and the Low Countries might have been the result of poorer populations, but it appears inescapable that oats were a fairly inelastic commodity in these places. There are no estimations of the poverty rates in medieval Scotland, but according to Grant the gulf between nobles and non-nobles was smaller than it was in medieval France.⁴⁴⁶ This suggests that income distribution might have been narrower. Rather than assume that the widespread consumption of oats in Scotland indicated that they were as poor as the poorest of London,

⁴⁴¹ *Ibid.*

⁴⁴² M. Carlin, 'Provisions for the Poor: Fast Food in Medieval London', *Franco-British Studies*, Vol. 20 (1995), p. 44. For the original quotation in *Piers Plowman*, see *Piers Plowman: The C Version*, ed. G. Russell and G. Kane (Berkeley, 1997), IX, lines 71–97.

⁴⁴³ Particularly in the form of oatcakes, which were especially prevalent in the north of England. P. C. D. Brears, *Cooking and Dining in Medieval England* (Totnes, 2008), p. 112; D. Banham, *Food and Drink in Anglo-Saxon England* (Stroud, 2004), p. 16.

⁴⁴⁴ Galloway, 'London's Grain Supply', p. 26.

⁴⁴⁵ Nicholas, *Medieval Flanders*, p. 100.

⁴⁴⁶ Grant, *Independence and Nationhood*, p. 88.

it seems more sensible to believe that the Scots ate oats in quantity simply because the climate lent itself to growing oats. Up to 20% of people living in late medieval Wells were considered poor,⁴⁴⁷ but in Hainaut, Artois, Brabant and parts of Holland, the poverty rate was between 20% and 30% during the same period.⁴⁴⁸ Though coastal Flanders witnessed the rise of agrarian capitalism in the fifteenth and sixteenth centuries, it is also likely that those living in the countryside were generally poorer than those who lived in urban centres.⁴⁴⁹ Thus we might expect that rural consumption of oats was higher than urban oat consumption, and that cities consumed more expensive grains (like wheat) in greater quantity.⁴⁵⁰ This would certainly have been exacerbated if rural grain prices were almost in keeping with city prices, since the countryside obtained grain from city distribution centres.⁴⁵¹

Having now established the climate trends of north-western Europe, the hardness of the three crops under discussion here, and the likely demand elasticity for each, it is now possible to ascertain how these factors influenced the price trends of farinaceous goods. Though we do not have crop yield data for Flanders, Brabant and Scotland to the same extent as for England, a reasonable case can be made for the use of the English data in these regions given the apparent similarity in climate.

⁴⁴⁷ D. G. Shaw, *The Creation of a Community: The City of Wells in the Middle Ages* (Oxford, 1993), p. 229.

⁴⁴⁸ M. Mollat and A. Goldhammer, *The Poor in the Middle Ages: An Essay in Social History* (New Haven, 1986), p. 81; Carlin, 'Fast Food', p. 46.

⁴⁴⁹ van Bavel, *Manors and Markets*, p. 262.

⁴⁵⁰ Nicholas suggests that during famines, the cities were the only places where bread could be bought. Nicholas, *Medieval Flanders*, p. 101.

⁴⁵¹ *Ibid.*, p. 360.

Short- to medium-term effects of climate can easily be seen in much of the commodity price data set out in Section 3.1. In England the price trends of many farinaceous goods show that the 1360s was a decade of inflation. This was particularly the case for barley and wheat [Figures 3.1 and 3.2], the two grains under most consistent demand pressure. These findings are consistent with those set out by Pribyl in her examination of the relationship between temperature, precipitation and grain prices. She finds many instances where extreme weather in the late medieval period did translate directly into higher grain prices. Pribyl notes that ‘many of the wet and cold spring–summers after 1350 fell within the following 25 years, a period commonly known as the “Indian summer” of demesne farming, when bad weather and subsequent poor harvests played a role in the sustained high grain prices after the Great Pestilence, and thereby helped to prolong the profitability of demesne farming’.⁴⁵² Oats, a more robust crop, and less essential to the English diet, did not suffer from price inflation in the 1360s, and prices stayed at a similar level to that of the 1350s, Figure 3.3. This corresponds with the poor crop yields, established by Campbell in (as shown in Figure 3.22), and his findings on the quality of weather in the 1350s and 1360s.⁴⁵³ There are a number of other instances in the English price data where the short-term impact of climate is evident. The 1430s, a decade of famously bad weather, saw fairly consistent price inflation in many commodities in England. Again, this is especially visible in wheat prices, but it is also clearly evident in barley, cheese and salt prices.⁴⁵⁴ The most apparent short-term influence of climate in England can be found in

⁴⁵² Pribyl, *Farming, Famine and Plague*, p. 192.

⁴⁵³ Campbell, *Great Transition*, pp. 280–1.

⁴⁵⁴ See Figures 3.2, 3.1, 3.8 and 3.9 respectively.

the 1480s. This period of severe flooding and rain caused almost all commodity prices to spike upwards—save for oats, herring, canvas and linen.⁴⁵⁵ Compared with the price reactions to the poor weather of the 1430s, this speaks of a more dramatic crisis, for even commodities not as heavily influenced by climate—like salmon and salt—suffered from inflation. It is probable that, as harvests failed, a shortage of grain meant demand for food shifted to other commodities, like animal and fish products. With this logic, it is plain to see how climate could influence price trends of non-farinaceous goods.⁴⁵⁶

Similar short-term climate effects are also visible in Scotland. Like England, it is probable that Scotland suffered from bouts of poor weather in the fifteenth century, especially (as already noted) in the 1430s and 1480s. During these two decades, price inflation was particularly common in farinaceous goods. Barley and wheat both incurred consistent inflation in these decades.⁴⁵⁷ Oats, though the hardiest of the grains, were the main grain for the Scots and the inelastic demand pressure meant that prices reacted particularly dramatically to the poor weather of the 1480s.⁴⁵⁸ Also, in Scotland, as we have seen for England, price inflation extended to many (but not all) non-farinaceous goods. The prices of salmon and salt, two commodities crucial to the Scottish diet, reflected the shortage of grains in the 1430s and 1480s, yet the prices of cheese were lower in the 1480s than in the 1470s.⁴⁵⁹ Thus, as was the case for England, it is evident that short-term climate

⁴⁵⁵ See Figures 3.3, 3.5, 3.9 and 3.12 respectively.

⁴⁵⁶ Salt, for example, which was used as a preservative, would also have become more valuable in a time of famine because it offered a means of prolonging the lifetime of a limited supply of perishable foodstuffs.

⁴⁵⁷ See Figures 3.1 and 3.2.

⁴⁵⁸ See Figure 3.3.

⁴⁵⁹ See Figures 3.6, 3.9 and 3.7.

shocks were more than capable of triggering price changes in Scotland.

We can find the same conclusions in the Flemish and Brabantine data. Figure 3.22 suggested that crop yields were possibly at their best during the bullion famine period. In contrast to England, where prices rose slightly, Flanders and Brabant tended to experience general deflation.⁴⁶⁰ This could well have been the result of a contracting money stock caused by the bullion famine, but, in the case of farinaceous goods, this monetary-induced deflation could also have been exacerbated by a more plentiful supply of grain. Indeed, the deflation in this period appears strongest in barley, wheat and oat prices,⁴⁶¹ which seems to confirm this supposition. As we have seen in England and Scotland, there were also fairly reliable inflationary responses to the poor weather of the 1430s and 1480s. This was especially clear for farinaceous goods, dairy and salt prices.⁴⁶²

It is evident that decades of particularly poor weather, or particularly bountiful harvests, tended to affect short-term price trends. Gauging the long-term effect of climate is more difficult, but it can be done for farinaceous goods by including the corresponding crop yield data in the regression analysis.⁴⁶³ Interpretation of the regression results is straightforward: a negative coefficient is expected if prices rose when grain yields fell. Interestingly, I have found that it was uncommon for grain yields to have played a strong role in the long-term price trends of farinaceous goods. The individual regression analysis shows that barley yields explain 3.29% of English nominal barley price fluctuations, and a

⁴⁶⁰ See Section 3.1, in particular Figures 3.1, 3.2, 3.3 and 3.7.

⁴⁶¹ See Figures 3.1, 3.2 and 3.3.

⁴⁶² Figures 3.1, 3.2, 3.3, 3.7 and 3.9.

⁴⁶³ In contrast to the other independent variables, I have offset grain yields and prices by a one-year lag to reflect the reality that prices would not have instantly responded to crop failure.

1% rise in yields could have caused barley to fall by 0.119% [Figure 3.14.2]. In Scotland, barley yields explain 5.41% of price fluctuations, and a 1% rise in yields could have deflated barley prices by 0.363%. The coefficients for both England and Scotland are significant only at the 5% level. For Flanders, yields explain only 1.21% of barley price fluctuations, and while the coefficient is negative, the lack of statistical significance weakens the results. Likewise, barley yields account for only 0.4% of Brabantine barley price movements, and produce an equally weak—yet negative—statistically insignificant coefficient. The results are even weaker for the individual regression of oat prices, with the r^2 for England being the highest, at 0.59% [Figure 3.13.2]. The coefficients are negative for England and Scotland, though they lack statistical significance. The results are even less telling for Flanders and Brabant, where the coefficients are actually slightly positive (0.024 and 0.021 respectively), but they too lack statistical significance.

The only instance where grain yields can be seen to have been a strong and clear determinant of long-term prices is for wheat. Figure 3.16.2 shows that when the independent variables are regressed individually, wheat yields are the most important independent variable for England. Here they explain 19.39% of wheat price fluctuations, and a 1% increase in wheat yield could have depressed prices by 0.194%. Though debasement still explains the majority of the Scottish wheat price trend, wheat yields are the second most important independent variable, explaining 14.49% of price fluctuations. The coefficient is even stronger than England's, with a 1% increase in wheat yields translating to a 0.494% fall in prices. As in England, wheat yields explain the majority of the Flemish wheat price trends, with the r^2 suggesting that 15.74% of price fluctuations can be accounted for by

grain yields. A negative coefficient again offers the desired causal relationship, and suggests that a 1% rise in wheat yields could have caused wheat prices to fall by 0.21%. These coefficients for England, Scotland and Flanders are all significant at the 1% level. For Brabant, the results are less clear. Though the coefficient is still negative, a lack of statistical significance and an r^2 of just 1.41% does not offer much to work with.

This comparison of grains has suggested that it is quite probable that the fluctuation of grain yields was less pronounced for more hardy crops. With oats being the least affected by crop yields and wheat the most, it indicates that more robust crops were therefore more resistant to climate shocks (and thus their supply was more stable). Consequently, the prices of hardier crops were less swayed by particularly bountiful or poor harvests, and were therefore more resistant to climate shocks. It is also likely that, as Campbell has noted, wheat was the grain that set the price levels for other grains, and thus the impact of climate would be expected to have been greater for wheat than for barley and oats.⁴⁶⁴ However, we still cannot ignore the impact of relative demand pressure for particular grains. For example, one would anticipate that the ficker the crop yield, the more volatile the price series. Yet a simple comparison of price volatility demonstrates that this was not always the case.

Price volatility can be measured by calculating the r^2 of a price series against its line

⁴⁶⁴ Campbell and Ó Gráda, 'Harvest Shortfalls', p. 864. Though the authors suggest that the correlation between grain prices is suggestive of market integration and interchangeability in demand between grains, this might well have been the case in England if poor weather reduced the supply of popular grains, but in Scotland it is unlikely that wheat was interchangeable with oats. This is because, as has already been discussed in this thesis, the Scots relied on oats as a dietary staple and this was the only grain that could be produced in vast quantities and with reliability in Scotland—wheat was commonly imported, and barley was still more difficult to grow than oats. See above, pp. 204 and 205.

of best fit.⁴⁶⁵ The closer the r^2 is to 1, the less the prices deviate from the line of best fit and thus the lower the volatility. Due to the patchy nature of the Scottish data, I have also included calculations for the standard deviations. Interpretation of standard deviation results is straightforward: the lower the figure, the lower the volatility.⁴⁶⁶ Figures 3.23, 3.24 and 3.25 give the volatility for wheat, barley and oat prices respectively. The results for England are as expected: wheat is the most volatile of all the grains, most probably the result of its vulnerability to poor weather and high demand pressure. For Flanders and Brabant, the r^2 and standard deviations give mixed results, but suggest that volatility was fairly close run between all three grains. The results for Scotland are the most interesting, however. They show that wheat prices were the least volatile of the three grains, with 73.876% of price fluctuations explained by the line of best fit. These results are closely followed by barley prices, which were slightly more volatile, with the r^2 showing that 73.144% of price movements can be accounted for by the line of best fit. By far the most volatile grain is oats, where the line of best fit explained just 33.956% of price movements. The ranking of these volatility results is confirmed by the standard deviations. This suggests that, at least in the case of Scotland, though the price trends of a more robust crop will not reflect harvest yields as closely as more vulnerable crops, the price volatility of more robust crops can be exacerbated by high demand pressure. This is because higher demand pressure amplifies any shortfalls in supply, and even though oats

⁴⁶⁵ I determined the most appropriate line of best fit by taking the type that returned the strongest r^2 .

⁴⁶⁶ I am aware that one should not use standard deviation for non-stationary data. However, the nature of the Scottish data has rendered it necessary to include two forms of measuring data volatility. The standard deviation simply acts to supplement the results of the r^2 .

were the most reliable of the grains, its centrality to the Scottish diet made its prices far more responsive to any small change in supply—regardless of whether this resulted from harvest failure or some other crisis.

This section has demonstrated the importance of climate and crop yields on short-, medium- and long-term grain prices. It is evident that climate crises had a particularly powerful effect on grain prices. It has also been seen that long-term grain prices were often negatively correlated with crop yields. However, it has become clear that the importance of crop yields on grain prices only manifests itself strongly when the crop in question was one particularly vulnerable to poor weather, i.e. wheat. Though this section has shown that there was a clear, albeit varying, link between the robustness of the crop and the impact of grain yields as a driving force of grain prices, this conclusion did not consistently translate into price volatility. For England, wheat was, as expected, the most volatile of the crops. In Flanders and Brabant, there was not a dramatic difference between the grains. For Scotland, however, oat prices were the most volatile of the grains, even though they were the most robust crop. It was concluded that this was the result of extremely high demand pressure for oats, which exacerbated any supply shortage. Thus, we can conclude that climate and crop yields were often an important factor in grain price trends, but it was possible for demand forces to interfere with some of their impact.

<i>Place</i>	<i>Commodity</i>	<i>Period</i>	<i>Line of Best Fit Type</i>	<i>Line of Best Fit Equation</i>	R^2	<i>Standard Deviation</i>
<i>Scotland</i>	Wheat	Entire	Exponential	$y = 27.285e^{0.0113x}$	0.73876	47.78
<i>England</i>	Wheat	Entire	Polynomial, order 4	$y = 6E-08x^4 - 2E-05x^3 + 0.0028x^2 - 0.1606x + 11.138$	0.14105	34.4
<i>Flanders</i>	Wheat	Entire	Polynomial, order 6	$y = -1E-11x^6 + 7E-09x^5 - 1E-06x^4 + 9E-05x^3 - 0.0036x^2 + 0.0602x + 0.0267$	0.24377	38.32
<i>Brabant</i>	Wheat	Entire	Polynomial, order 6	$y = -2E-08x^6 + 1E-05x^5 - 0.0045x^4 + 0.7739x^3 - 72.967x^2 + 3599.6x - 72508$	0.37533	42.43

FIGURE 3.23
Volatility of Nominal Wheat Prices
[As Figure 3.2]

<i>Place</i>	<i>Commodity</i>	<i>Period</i>	<i>Line of Best Fit Type</i>	<i>Line of Best Fit Equation</i>	<i>R²</i>	<i>Standard Deviation</i>
<i>Scotland</i>	Barley	Entire	Exponential	$y = 12.274e^{0.0141x}$	0.73144	40.97
<i>England</i>	Barley	Entire	Polynomial, order 4	$y = 4E-08x^4 - 1E-05x^3 + 0.0021x^2 - 0.1452x + 8.8512$	0.42403	46.00
<i>Flanders</i>	Barley	Entire	Polynomial, order 6	$y = -8E-12x^6 + 4E-09x^5 - 6E-07x^4 + 5E-05x^3 - 0.0019x^2 + 0.032x + 0.0188$	0.25278	38.62
<i>Brabant</i>	Barley	Entire	Polynomial, order 4	$y = 3E-07x^4 - 0.0002x^3 + 0.026x^2 - 1.6766x + 51.49$	0.40285	36.28

FIGURE 3.24
Volatility of Nominal Barley Prices
[As Figure 3.1]

<i>Place</i>	<i>Commodity</i>	<i>Period</i>	<i>Line of Best Fit Type</i>	<i>Line of Best Fit Equation</i>	<i>R²</i>	<i>Standard De- viation</i>
<i>Scotland</i>	Oats	Entire	Exponential	$y = 10.255e^{0.0102x}$	0.33956	58.27
<i>England</i>	Oats	Entire	Polynomial, order 4	$y = 3E-08x^4 - 9E-06x^3 + 0.0011x^2 - 0.0652x + 4.5501$	0.4814	32.74
<i>Flanders</i>	Oats	Entire	Polynomial, order 6	$y = -8E-11x^6 + 5E-08x^5 - 1E-05x^4 + 0.0015x^3 - 0.0843x^2 + 1.8112x + 10.067$	0.20872	30.36
<i>Brabant</i>	Oats	Entire	Polynomial, order 6	$y = -3E-12x^6 + 1E-09x^5 - 3E-07x^4 + 2E-05x^3 - 0.0009x^2 + 0.0169x + 0.0471$	0.20629	40.52

Figure 3.25
Volatility of Nominal Oat Prices
[As Figure 3.3]

3.2.4 POLITICS, CONFLICT AND TRADING RELATIONS

This chapter has offered a number of conclusions so far. It is apparent that population had the strongest long-term effect on English prices. In contrast, the effect of population on prices in Flanders and Brabant appears to have been fairly minimal. Debasement was often statistically insignificant as a driver of most English commodity prices, though it was more pertinent to goods that were commonly traded. Debasement was commonly a strong driver of prices for Scotland, Flanders and Brabant. Mint output, interestingly, has also been seen to play a consistent, low-level role in English price trends. In Brabant there was commonly a clear positive relationship between mint output and prices, but this was less clear for Flanders. In Scotland, mint output was only occasionally linked to price trends, but this might have been the result of patchy data. The role of climate, as indicated by the use of Campbell's crop yields as a proxy, suggested that it only had a strong long-term effect on grain prices in the case of wheat, the least tough of all the grains.

Of course, before we can draw any final conclusions, we must consider one last group of factors: politics. Therefore this section is concerned with the short-term impact of politics, conflict and trading relations on price trends. In contrast to population, debasement, mint output and crop yields, it is difficult to quantify these factors and apply them to the analysis of long-term price trends. Thus, they have remained absent from the previous regression analyses, their existence acknowledged under the umbrella of the 'error' term ε_c alone. The inability to quantify these factors does not mean that they were unimportant, however; on the contrary—as this section demonstrates—they contributed to

some of the most dramatic short-term price shifts in the entire post-Black Death period. Indeed, it has been seen that it was common for Flemish prices to show weaker responses to the impact of population, debasement and mint output than to political events/factors. In his own work on the Low Countries' economy, Munro suggested that this might have been because Flemish commercial economy was subjected to more supply shocks than was the case in Brabant.⁴⁶⁷ This section explores the presence and prevalence of these supply shocks and other phenomena. It takes a chronological approach to the price data, offering suggestions of where politics, conflict and trade might have been contributing to price fluctuations. Of course, it does not attempt to include every minor event but, using a chronological approach, focuses on the main ones seen in the historical narratives.

Let us begin with the 1360–1370s, when English prices generally fell in nominal terms. Scottish prices tended to remain quite flat because, despite the debasement, the ransom of David II prevented the Scottish money stock from increasing.⁴⁶⁸ In this period, so closely following the main Black Death outbreak, it is unlikely that any significant population recovery had begun. The so-called Children's Plague of 1361 further hampered population recovery in England, Scotland and, presumably, the Low Countries.⁴⁶⁹ In contrast to England's, Flemish and Brabantine prices were rising in the 1360s–70s. This is

⁴⁶⁷ Munro, 'Mint Outputs, Money, and Prices', p. 45. To ascertain whether this conclusion applied generally to the overall impression of price trends, I also reduced the regression analysis time parameters to 1420–1500 for both the Flemish and Brabantine baskets of consumables (see Sections 3.3.1 and 3.3.2 below) in order to ensure that the variation was not caused by the time difference. I found that there was no great divergence in the results, so we can therefore discount the date ranges as the cause of this variation.

⁴⁶⁸ See above, p. 94.

⁴⁶⁹ A. R. Bridbury, *Medieval England: A Survey of Social and Economic Origins and Development* (Leicester, 2008), p. 74.

especially clear in the price trends of barley, wheat, oats, cheese and cloth.⁴⁷⁰ Yet, even though the Low Countries' population might well have recovered from the plague more quickly than England's, at this point in time it is safe to rule out increasing demand pressure as the main driver behind the rise in Flemish and Brabantine nominal prices.⁴⁷¹ Changes to the Flemish currency might have been partly to blame. Flanders debased the gold coinage twenty-two times and the silver eighteen times between 1349 and 1384,⁴⁷² but England only debased once, in 1351.⁴⁷³ These Flemish debasements coincided with very high mint output between the 1350s and 1370s.⁴⁷⁴ Rising prices can also be caused by a lack of supply, but the Campbell crop yield data showed that all grains were generally increasing in yield from 1360 to 1400.⁴⁷⁵ The revolt in Ghent between 1359 and 1361 could have contributed to some of the inflation during these decades, given that Ghent was a major centre for grain distribution.⁴⁷⁶

However, civil discontent was not guaranteed to cause price inflation. In England, there was no rise in prices in 1381, suggesting that the Peasants' Revolt did not disrupt supply chains. Compared to the Ghent rebellions, the Peasants' Revolt was a short-lived affair, which might also have helped to negate the appearance of any economic repercussions. The general price reaction to revolt was not necessarily consistent in the Low

⁴⁷⁰ See Figures 3.1, 3.2, 3.3, 3.7 and 3.12 respectively.

⁴⁷¹ See Section 2.3.

⁴⁷² Nicholas, *Metamorphosis*, p. 120.

⁴⁷³ Allen, *Mints and Money*, 329; S. Waugh, *England in the Reign of Edward III* (Cambridge, 1991), p. 81.

⁴⁷⁴ See Sections 2.1.5 and 2.2.1.

⁴⁷⁵ See above, p. 200.

⁴⁷⁶ D. J. Harreld, *High Germans in the Low Countries: German Merchants and Commerce in Golden Age Antwerp* (Leiden, 2004), p. 50. For a summary of revolts and embargoes in Flanders, see Munro, 'Mint Outputs, Money, and Prices', p. 46.

Countries either. There was more civil discontent in Flanders in the 1380s: the 1379–83 Artevelde revolt meant that merchants from Bruges could not get safe passage to Antwerp in 1382. The frontier war between Brabant and Gelderland in 1386–7—in addition to the French military intervention—made travel by road in Brabant even less secure.⁴⁷⁷ But the falling prices of grains and other commodities in this decade suggest that these disruptions had less impact than revolts in earlier decades.⁴⁷⁸ It is possible, however, that the troubles in the 1380s simply acted to slightly offset declining prices caused by the currency reinforcement, and thus most of their effects were masked.

The price decline seen in the 1380s in Flanders and Brabant continued into the early fifteenth century. Unlike English grain prices, Flemish and Brabantine grain prices plummeted in both nominal and silver terms in the 1390s and 1400s.⁴⁷⁹ This could have been the result of good crop yields,⁴⁸⁰ but the disparity with the English trends suggests that a non-mutual factor was dominant. It is also possible to attribute the falling prices in the Low Countries in this period to a declining inflow of bullion, which occurred as the Flemish cloth industry's decline reached crisis point. The reinforcement of the currency in 1390 also probably helped to depress prices. In practice, the Flemish reinforcement of the silver currency in 1390 lowered the value of silver relative to the face value of the coin. Thus, incentive to bring coin to the Flemish mints also dried up. The outflow of bullion from the Low Countries was also exacerbated by the ransom of John the Fearless in 1396,

⁴⁷⁷ Van der Wee, *Growth of the Antwerp Market*, ii, pp. 12–13.

⁴⁷⁸ Munro, 'Mint Outputs, Money, and Prices', p. 46.

⁴⁷⁹ Scotland's grain price data is generally missing for this period.

⁴⁸⁰ See above, p. 200.

following his capture at the Battle of Nicopolis. His ransom was set at a substantial half a million *livres tournois*. It is thus unsurprising that the money market at Bruges was suffering from a lack of gold in this period.⁴⁸¹

Though Flanders and Brabant tended to experience price inflation from the early fifteenth century until the 1430s, this appears to have generally been more pronounced for Brabant than Flanders. This is clearest in the price trends of oats and cheese.⁴⁸² There are a number of reasons why this inflation was worse for Brabant. The sudden death of Anthony of Burgundy—the duke of Brabant—was followed by the minority of John IV; this must have caused general instability. The money of account deteriorated in Brabant between 1417 and 1420, and this had economic repercussions until c.1426. Northern Brabant also felt the impact of military unrest in Zeeland, Holland and Utrecht.⁴⁸³

The especially high salmon prices in England in the 1420s might have been a result of soured relations between England and Scotland, which could have interrupted the supply of salmon [Figure 3.6]. It was unlikely to have been a monetary phenomenon because no new Anglo-Scottish exchange rate had been imposed since 1390, and the English debasement had been a decade earlier (also the 1411 debasement did not appear to have triggered any price reactions). In 1421 the English had been defeated by the Scots at the Battle of Baugé,⁴⁸⁴ and the *Auld Alliance* had probably been proving problematic for the English salmon trade during the first decade of Henry V's reign. It is impossible to tell whether

⁴⁸¹ R. Vaughan, *John the Fearless: The Growth of Burgundian Power* (London, 1966), p. 120; van der Wee, *Growth of the Antwerp Market*, ii, p. 29.

⁴⁸² See Figures 3.3 and 3.7.

⁴⁸³ Van der Wee, *Growth of the Antwerp Market*, ii, pp. 33–4.

⁴⁸⁴ I. A. MacInnes, *Scotland's Second War of Independence, 1332–1357* (Martlesham, 2016), p. 223.

there was a negative impact on salmon prices from the Scottish piracy of the early fifteenth century, because there is insufficient data.

Scottish herring prices also appear high in the 1420s and 1430s.⁴⁸⁵ Though the latter is no doubt the result of increased demand for fish during the poor harvest years, the high prices in the 1420s might have been the result of disruption at sea caused by piracy. In the early fifteenth century the Scots had been conducting acts of piracy and, in 1412, the Hanseatic League responded by placing an embargo on Scottish wool that was not lifted until 1436. From 1416 onwards, Scotland's relationship with Burgundy deteriorated, following the piracy against Burgundian ships. In the 1420s, the Scottish-Flemish relationship also soured for the same reason.⁴⁸⁶

Though English prices tended to remain fairly flat throughout the fifteenth century, there was particularly prominent deflation in the value of English wool from 1400 onwards. This was almost certainly a symptom of the collapse of the Flemish cloth industry, which left the English wool market lacking demand for its exports. The impact of the Flemish cloth industry's collapse was to a certain extent offset by the rise in English woolen cloth production, but the outbreak of Anglo-Flemish war in the early decades of the fifteenth century, which often included bans on the sale of English cloth, further depressed demand for English cloth and, in turn, its value.⁴⁸⁷

Prices were high in England in the 1480s. This is evident in the price trends of grains,

⁴⁸⁵ See Figure 3.5.

⁴⁸⁶ Stevenson, *Power and Propaganda*, p. 164.

⁴⁸⁷ For a detailed narration and analysis of the Anglo-Burgundian conflict of the first half of the fifteenth century, and its impact on the wool and cloth trades, see Munro, *Wool, Cloth, and Gold*, pp. 93–154.

and also particularly clearly for salt.⁴⁸⁸ Salt price inflation in England in this period was probably exacerbated by further trade disruption. When Richard III came to the throne, he quickly engaged in a policy of piracy on the English Channel, attacking Breton ships and damaging relations with Francis, the duke of Brittany.⁴⁸⁹ This alone was probably not sufficient to damage the salt trade in both England and Brabant for a decade, however. The supply of French salt was probably further impeded because much of it came from the Bay of Bourgneuf, which sat across Brittany and Poitou.⁴⁹⁰ The import of French salt might well have been encouraged after England obtained Guyenne and Poitou in the 1360 Treaty of Bretigny; but after Aquitaine was lost in the middle of the fifteenth century, the salt trade from France became more vulnerable. This vulnerability was intensified after civil war broke out in France during the minority of Charles VIII. Anne of Beaujeu faced constant rebellion from the Duke of Orléans between 1483 and 1491. Brittany was dragged in when Duke Francis became frail and his over-powerful Treasurer, Pierre Landais, sought to take control. The Breton nobles sided with Anne of Beaujeu, and Landais with Orléans. This meant that both territories which had control of the Bay of Bourgneuf were embroiled in civil war for almost a decade.⁴⁹¹ Consequently, the supply of salt and other imports to England was probably disrupted.

It is also common to see particularly strong inflation in Flanders and Brabant during the 1480s. Though it was stated in Section 3.2.4 that the 1480s was a period of extremely

⁴⁸⁸ See Figure 3.9.

⁴⁸⁹ A. Grant, 'Foreign Affairs Under Richard III', in J. Gillingham (ed.), *Richard III: A Medieval Kingship* (London, 1993), pp. 123–4.

⁴⁹⁰ A. R. Bridbury, *England and the Salt Trade in the Later Middle Ages* (Oxford, 1955), p. 57.

⁴⁹¹ Grant, 'Foreign Affairs', pp. 123–31.

poor weather, this was common to England, Scotland, Flanders and Brabant, and thus the especially high prices of the 1480s must have been exacerbated by another factor. In addition to the reintroduction of debasement, and the consequential high mint output in Flanders and Brabant in the 1470s and 1480s, two political events possibly caused Flemish and Brabantine prices to inflate more than English prices. The first was when Louis XI of France closed the French frontier between 1477 and 1483; and the second was the Ghent rebellion against Duke Maximilian of Austria between 1482 and 1492.⁴⁹² It is quite likely that the effects of these political disruptions were not localised: Tits-Dieuaide has argued that in times of war, even in areas where there was no actual fighting, fear would keep farmers out of the fields which caused the agrarian sector to seize up.⁴⁹³ Thus, the supply of agrarian goods would be limited, both through transport issues and production. The combined effect of civil war and poor harvests—with no grain imports from France, and no distribution from Ghent—justifies the exceptionally high food price inflation in the 1480s. In particular, the civil war was the most likely cause of the high salt prices in Brabant and England because Zeelandish salt prices were much lower than the French-Iberian salt prices in this decade, Figure 3.8.

In Scotland, the 1480s was also a decade of war and civil unrest, which might also have contributed to the sharp rise in prices.⁴⁹⁴ The Anglo-Scottish war reignited in 1480,

⁴⁹² Spufford, 'Debasement of the Coinage', p. 73; H. Koenigsberger, *Monarchies, States Generals and Parliaments: The Netherlands in the Fifteenth and Sixteenth Centuries* (Cambridge, 2001), p. 58.

⁴⁹³ M. J. Tits-Dieuaide, 'Cereal Yields Around Louvain, 1404–1729', in H. van der Wee and E. van Cauwenbergh (eds), *Productivity of Land and Agricultural Innovation in the Low Countries (1250–1800)* (Leuven, 1978), p. 104.

⁴⁹⁴ This is seen most clearly for barley, wheat, oats, salmon, wine and canvas prices. See Figures 3.1, 3.2, 3.3, 3.6, 3.10 and 3.12 respectively.

having been encouraged by the offer of 10,000 crowns from Louis XI to James III, in exchange for keeping Edward IV busy with the Scottish border.⁴⁹⁵ There was also a renewal of the *Auld Alliance* in 1479 after Richard, duke of Gloucester, had supported the claim of Alexander, duke of Albany, to the Scottish crown.⁴⁹⁶ Thus, Gloucester led a series of campaigns north of the border, which eventually culminated in the capture of Berwick in 1482.⁴⁹⁷

After the 1480s, price trends varied less between England, Scotland and the Low Countries. As stated above, this was probably a combination of widespread population growth and a growing availability of silver.⁴⁹⁸ However, herring prices in England and Scotland resisted the inflationary trends of the late fifteenth and early sixteenth centuries. In England, there was decline and price stagnation from the 1470s onwards. Great Yarmouth, the main port for herring in the fourteenth and fifteenth centuries, had fallen into decline in the 1470s and local merchants began to move their business elsewhere.⁴⁹⁹ This decline could have been the result of an increasing demand for cheaper fish of better quality sold by the Low Countries and Hanseatic fishermen. The influx of cheaper, yet better quality, fish would have forced the price of English herring down as the English fishermen frantically tried to keep business.⁵⁰⁰ In Scotland, though the decennial average

⁴⁹⁵ Macdougall, *James III*, pp. 114–15.

⁴⁹⁶ S. G. Ellis and C. Maginn, *The Making of the British Isles: The State of Britain and Ireland, 1450–1660* (Harlow, 2007), p. 51.

⁴⁹⁷ M. Prestwich, 'The Enterprise of War', in R. Horrox and W. M. Ormrod (eds.), *A Social History of England, 1200–1500* (Cambridge, 2006), p. 85.

⁴⁹⁸ See above, p. 73 and Section 2.3.

⁴⁹⁹ *Calendar of Patent Rolls: Edward IV–Henry VI A.D. 1467–1477* [CPR], Public Record Office (London, 1900), 1467–77, p. 393.

⁵⁰⁰ Gemmill and Mayhew, *Changing Values*, p. 319.

for the 1500s shows that prices fell heavily, this is skewed by the entire decade containing just one data entry. But it is likely that prices did not continue to rise in the early sixteenth century because there was an increase in the supply of herring when the shoals returned.⁵⁰¹ Like England, it is also possible that herring prices were depressed by the competition from the Dutch fishermen, who offered cheap fish.⁵⁰²

This section has demonstrated that there were a number of major political, trade and civil unrest events which potentially made a significant contribution to the fluctuation of general and specific commodity prices. These phenomena could have damaged the transportation of goods, drained bullion from the country, or otherwise depressed consumer demand. Though it is not possible to quantify the precise impact of these factors, it is important to acknowledge that their role could have been as significant for short-term prices as other factors have proved for long-term price trends.

3.3 BASKETS OF CONSUMABLES

3.3.1 BASKETS OF CONSUMABLES: STRUCTURE AND WEIGHTING

So far we have established that population was the main driver of long-term prices in England, while debasement was more important for Scottish, Brabantine and Flemish

⁵⁰¹ It has been argued that the fifteenth century was a time of poor herring hauls in Scotland because the shoals migrated. Gemmill and Mayhew, *Changing Values*, p. 318.

⁵⁰² As argued by Rorke: 'The Scots viewed the success of the Dutch fisheries with considerable envy'. They became determined to increase their fishing efforts, and on 8 May 1493 made an explicit move towards emulating the Dutch fishing approach. However, it was not until the sixteenth century that the Scottish fishing industry began to play a larger role in the European fish trade. M. Rorke, 'The Scottish Herring Trade, 1470–1600', *Scottish Historical Review*, Vol. 84, No. 2 (2005), pp. 151–2; *RPS*, 1493/5/21.

prices. Mint output was consistently significant in England, albeit at a low level. In Brabant, mint output was positively linked to prices in many cases. Flemish prices were far less consistently linked to mint output, and the same was true of Scotland. Crop yield data has shown us that climate was only a significant driver of long-term prices in the case of wheat, but short-term effects of weather crises are fairly evident. Political factors have also been seen to have generally manifested themselves in the price data, especially where traded commodities were concerned. Having now established the extent to which population, debasement, mint output, climate, crop yields, political factors, trade and civil discontent influenced prices, it is possible to test the general overview of the conclusions by examining baskets of consumables.

Baskets of consumables are price indices of commodities constructed to reflect average consumption patterns of an individual. As such, they contain different goods and varying weighting for each country. Though it is possible to work out roughly what people were eating, the precise weights are largely dictated by data availability. There has already been a substantial amount of research conducted on medieval English baskets of consumables. In 1981, the pivotal work by Phelps Brown and Hopkins, *A Perspective of Wages and Prices*,⁵⁹³ opened up the area of study. A number of adaptations have since been made to the baskets. This chapter utilises those made by John Munro, who made a number of alterations to the Phelps Brown and Hopkins baskets. For example, where Phelps Brown and Hopkins did not include dairy products after 1430, the Munro adaptation

⁵⁹³ H. Phelps Brown and S. V. Hopkins, *A Perspective of Wages and Prices* (London, 1981). See also H. Phelps Brown and S. V. Hopkins, 'Seven Centuries of Building Wages', *Economica*, Vol. 22, No. 87 (1955), pp. 195–206.

does. This chapter uses Munro’s weights for England, applied to Munro’s and Clark’s price data. Munro also created a basket for Flanders and has used the basket weights that van der Wee created for Brabant, and made adjustments to allow their commodity groups to fluctuate depending on price levels.⁵⁰⁴ Here, these are used without alteration.⁵⁰⁵

<i>Place</i>	<i>Number of Commodities</i>	<i>Farinaceous Goods</i>	<i>Drink</i>	<i>Animal Proteins</i>	<i>Industrial Goods</i>
<i>England</i>	15	20%	22.50%	37.50%	20%
<i>Flanders</i>	8	24.19%	20.43%	35.37%	20.01%
<i>Brabant</i>	10	18.24%	17.08%	38.87%	25.81%

FIGURE 3.26
Weighting of the English, Flemish and Brabantine Baskets of Consumables
[Munro, ‘Wage-Stickiness’, p. 231.]

Figure 3.26 shows the variations between the English, Flemish and Brabantine baskets. The English basket is the broadest of the four used and contains fifteen commodities.⁵⁰⁶ The weights for Brabant are based upon a narrower set of commodities, drawing upon

⁵⁰⁴ With the exception of Flemish cloth prices, the Flemish and Brabantine price data comes from C. Verlinden and E. Scholliers, *Dokumenten voor geschiedenis van prijzen en lonen in Vlaanderen en Brabant* (3 vols, Bruges, 1959–72); and van der Wee, *Growth of the Antwerp Market*, i; for van der Wee’s Brabantine basket, see van der Wee, ‘Prijzen en Lonen’, pp. 415–17.

⁵⁰⁵ For Low Countries baskets of consumables, see H. van der Wee, *The Low Countries in the Early Modern World* (Aldershot, 1993), 279–87. For the construction and data of Low Countries and English baskets, see Munro, ‘English Prices and Wages Data’ (29 June 2018); Munro, ‘Flemish Prices and Wages Data’ (29 June 2018); Munro, ‘Brabantine Prices and Wages Data’ (29 June 2018); ‘Wage-Stickiness’, pp. 189–90, 231. For English price data, see Clark, ‘Price History’. Note that the data is also repeated on the R. C. Allen and R. W. Unger, ‘Allen-Unger Global Commodities Prices Database’, <<http://www.gcpdb.info/data.html>> (2 March 2017). However, there are numerous and significant errors. The butter price for 1392 in Brussels is incorrect by a decimal place (making it out by a factor of 10), and the commodities prices of English barley, north coal, south coal, peas, salt salmon, vinegar, wheat, saffron, soap, Port wine, firewood, London oats, hay, wool cloth and regular coal all need to be multiplied by 12, because Allen-Unger’s data mistook Clark’s prices in shillings as the price in pence.

⁵⁰⁶ The English basket contains wheat, rye, barley, peas, malt barley, sheep, herrings, butter, cheese, charcoal, candles, lamp oil, canvas/linen, shirting, and coarse woollens. See Munro, ‘Wage-Stickiness’, p. 231.

just ten.⁵⁰⁷ Flanders' basket is narrower still, with just eight commodities.⁵⁰⁸ Though England's basket is most certainly the broadest due to greater data availability, it remains the case that the commodities included are still based on known historical evidence; the Flemish and Brabantine baskets, on the other hand, are constructed on the basis that 'lijfrenten payments normally came from the *accijnzen* or excise taxes that the town levied on the inhabitants' consumption of various foodstuffs (alcoholic beverages, grain, flour, bread itself, meat and dairy products, herring and other species of fish ...).⁵⁰⁹

However, the reliance on data availability still means that some commodities are conspicuously absent from the baskets. For example, beef is excluded from the English index.⁵¹⁰ This obvious gap has been filled by Broadberry *et al.*, who have devised beef yields in late medieval England.⁵¹¹ There is substantial contemporary evidence to suggest that beef made up at least a portion of the diet of some in medieval England: in January 1348 the Commons heard the complaint that Edward III had not paid people for purveyances, which had included 'wheat, malt, barley, oats, bacon, beef and lamb'.⁵¹² A similar com-

⁵⁰⁷ The Brabantine basket contains rye, malt/barley, beef, herring, butter, cheese, charcoal, candles, canvas/linen, and coarse woollens. See Munro, 'Wage-Stickiness', p. 231.

⁵⁰⁸ The Flemish basket contains wheat, rye, malt/barley, peas, butter, cheese, and coarse woollens. See Munro, 'Wage-Stickiness', p. 231.

⁵⁰⁹ J. H. Munro, 'The Usury Doctrine and Urban Public Finances in Late-Medieval Flanders (1220–1550): Rentes (Annuities), Excise Taxes, and Income Transfers from the Poor to the Rich', in S. Cavaciocchi (ed.), *La fiscalità nell'economia Europea secc. XIII–XVIII* (Florence, 2007), p. 994.

⁵¹⁰ We do have cow prices, which were presented on p. 136.

⁵¹¹ S. Broadberry, B. M. S. Campbell, A. Klein, M. Overton, and B. van Leeuwen, 'British Economic Growth, 1270–1870', *CAGE Online Working Paper Series*, No. 35 (2010), p. 40.

⁵¹² *PROME*, ii, 171.

plaint was made to the Commons in September 1402, demonstrating that beef had remained a staple in the English diet after the Black Death.⁵¹³ Likewise, there is an absence of pork goods and lamb/mutton products in the English (and indeed all) baskets of consumables.⁵¹⁴ There are other commodities that must have been commonly consumed in the Southern Low Countries, yet these have been excluded from the baskets. Rye and barley are the only grains in the Brabantine basket, and barley's inclusion acts solely as a proxy for ale and beer prices. No meat or fish are included in the Flemish basket of consumables, leaving dairy products to carry the weight of the entire animal protein category. Fuel in any form is also absent from the Flemish basket, leaving the entire weight of the industrial goods category to be carried by coarse woollens. The existence of hearth taxes means it is inconceivable that the Flemish would have lived without heat and light,⁵¹⁵ and if they were producing cheese and butter, they were surely producing beef and other meats. The Flemish certainly had access to fish, even though it was excluded from the basket.⁵¹⁶ Thus, though the baskets offer an overview of general price trends, they are not necessarily representative of actual living costs because we should expect

⁵¹³ *Ibid.*, iii, 510.

⁵¹⁴ For more on the consumption of meat after the Black Death, see C. Dyer, 'Changes in Diet in the Late Middle Ages: The Case of Harvest Workers', *Agricultural History Review*, Vol. 36, No. 1 (1988), p. 25.

⁵¹⁵ J. de Smet, 'Le Dénombrement des Foyers en Flandre en 1469', *Bulletin de la Commission Royale d'Histoire*, Vol. 99, No. 99 (1935), pp. 105–50; Prevenier and Blockmans, *Burgundian Netherlands*, p. 392; Blockmans *et al.*, 'Tussen Crisis en Welvaart', pp. 44–5, 49, 52; van der Wee, *Growth of the Antwerp Market*, i, p. 546.

⁵¹⁶ Even though we do not have any Flemish fish prices, there is a good deal of evidence to suggest that there was a significant trade in fish. See Dijkman, *Shaping Medieval Markets*, p. 113; Nicholas, *Medieval Flanders*, p. 381; and of course, the Flemish were renowned for their *harringbuis* in the fifteenth century—specialised ships designed to withstand harsh weather at sea and stock a large quantity of herring in the hull. There was also on-board provision for gutting and salting. See L. Sicking and D. Abreu-Ferreira, *Beyond the Catch: Fisheries of the North Atlantic, the North Sea and the Baltic, 900–1850* (Leiden, 2009), p. 8.

that in times of price fluctuations, some goods might have been dropped from the basket or substituted for others.

No basket of consumables has been calculated for medieval Scotland. Amy Blakeway has, however, constructed a sixteenth-century basket.⁵¹⁷ Of all the baskets, the Scottish one draws upon the smallest number of commodities, using just seven. Figure 3.27 shows that it appears very similar to the English basket, with a higher emphasis on animal proteins than farinaceous goods. Given the climate of Scotland was uncooperative for growing but the hardiest of grains, the Scottish diet was heavier in pastoral products.⁵¹⁸

<i>Place</i>	<i>Number of Commodities</i>	<i>Farinaceous Goods</i>	<i>Drink</i>	<i>Animal Proteins</i>	<i>Industrial Goods</i>
<i>Scotland</i>	7	15%	22.50%	42.50%	20%

FIGURE 3.27
Weighting of the Scottish Basket of Consumables
[Blakeway, ‘Sixteenth-Century Price Rise’, p. 171.]

As with England and the Low Countries, a few important commodities have been left out of the sixteenth-century basket. Salmon, herring and dairy products are entirely excluded, even though fish was consumed regularly in medieval Scotland, as indicated by the frequent references in the Scottish Parliament records.⁵¹⁹ The extensive dataset of prices compiled by Elizabeth Gemmill and Nicholas Mayhew covers a far wider range of commodities than the Blakeway basket for sixteenth-century Scotland.⁵²⁰ However, the

⁵¹⁷ A. Blakeway, ‘The Sixteenth-Century Price Rise: New Evidence from Scotland, 1500–85’, *EconHR*, Vol. 68, No. 1 (2015), p. 171. The weighting of each commodity is as follows: malt at 21.25%, sheep at 21.25%, oatmeal at 15%, ale at 22.5%, candles at 7.5%, canvas at 6.25% and Holland cloth at 6.25%.

⁵¹⁸ Grant, *Independence and Nationhood*, p. 62.

⁵¹⁹ There are frequent mentions of the fishing industry throughout the fourteenth and fifteenth centuries. See for example *RPS*, 1318/13, 1398/11.

⁵²⁰ Gemmill and Mayhew, *Changing Values*.

price data is not consistent enough across all commodities to adjust Blakeway's basket for the fourteenth and fifteenth centuries.⁵²¹ Therefore, using Blakeway's basket weights and the price data from Gemmill and Mayhew, I have constructed a basic basket of consumables for late medieval Scotland.⁵²²

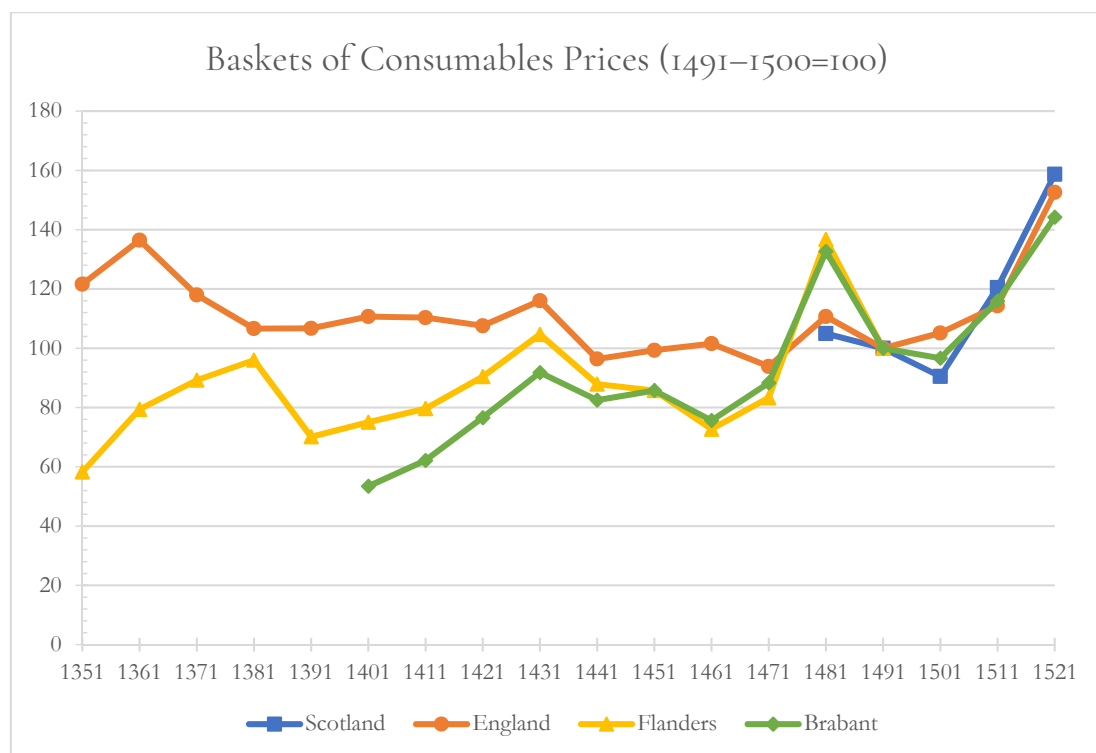


FIGURE 3.28

[Blakeway, 'Sixteenth-Century Price Rise', p. 171; Gemmill and Mayhew, *Changing Values*, pp. 145–360; Clark, 'Price History', pp. 35–105; Munro, 'Wage-Stickiness', p. 231; Munro, 'English Prices and Wages Data' (29 June 2018); Munro, 'Flemish Prices and Wages Data' (29 June 2018); Munro, 'Brabantine Prices and Wages Data' (29 June 2018).]

⁵²¹ I attempted to create a new basket which considered more commodities by splitting sub-categories to incorporate more items, but there were few years when I had a price for each commodity. This meant that, for those years without a full set of prices, I could not make a basket calculation. Consequently, my broader basket offered fewer data points than Blakeway's basket.

⁵²² To maintain consistency with the English, Flemish and Brabantine baskets, I have used barley as a proxy for ale. Relatively minor adjustments have been made to the industrial commodities category. Holland cloth is excluded from the medieval basket because it does not have a price series. Instead, canvas carries 12.5% of the industrial commodities category and the other 7.5% remains allocated to candles.

3.3.2 BASKETS OF CONSUMABLES: PRICE ANALYSIS

As was the case for the commodity price data, in order to compare all four baskets of consumables the data must be converted into indices. This negates the issue of the baskets containing commodities prices in different weights, measure and currencies, and allows us to examine the general trends of prices. Again, 1491–1500 is the base period because this is the only decade in which all four baskets have an observation. Using an index means that all the prices appear to converge in the 1490s, but this does not mean that the prices are all equal at that point—it is necessary to compare the base period with the wider trend of the series to see where it sits within the bigger picture.

Figure 3.28 shows that England's prices were generally flat, or even deflationary, across the late fourteenth and fifteenth centuries. In contrast, prices in Flanders and Brabant appear to have endured a long-term pattern of mild inflation, which was punctuated by troughs of deflation. The first trough was around the time of the bullion famine (c.1395–1415), when the closure of the Central European mines, combined with the outflow of silver to the East, which greatly reduced the availability of silver. Prices are then seen to have recovered, in line with van der Wee's suggestion that the period up to the 1430s possibly saw decreasing agricultural returns per capita on account of rising urbanisation.⁵²³ Indeed, the price data comes from urban settlements, so urbanisation pressure

⁵²³ H. van der Wee, 'Introduction—The Agricultural Development of the Low Countries as Revealed by the Tithe and Rent Statistics, 1250–1800', in H. van der Wee and E. van Cauwenberghe (eds), *Productivity of Land and Agricultural Innovation in the Low Countries (1250–1800)* (Leuven, 1978), p. 5. This argument certainly tallies with the rapid recovery of the Low Countries population, which was seen in Chapter 2 to have peaked in the 1430s. It also corresponds to the notion put forward by Clark that economic and agrarian productivity was inversely correlated with population. See Clark, 'Microbes and Markets'.

should have manifested itself as price inflation. Prices peaked in the 1430, when a series of poor harvests damaged crop yields.⁵²⁴ The second price trough in the southern Low Countries was in the middle of the fifteenth century, in line with Hatcher’s mid fifteenth-century ‘slump’. Yet, England’s prices, though low, remained fairly steady during both price troughs. In the last quarter of the fifteenth century all prices rose universally in the 1480s—when the poor weather again took its toll—and there was general inflation in the early sixteenth century. This is in line with the prevalence of demographic recovery and the reopening of the silver mines in Europe.⁵²⁵

It is clear that England’s price trends were unusually flat compared with those elsewhere, but to what extent can we accredit these differences in price trends to England’s uniquely low population and atypically stable currency? Regression analysis can again be used to test the impact of population levels, mint output, the fluctuating money supply, and debasement on basket prices.⁵²⁶ To do this, the baskets of consumables prices are set as the dependent variable, and the others act as independent variables. In the form of an equation, this regression is expressed as:

$$\ln X_t = \beta_0 + \ln \beta_1 \text{Penny}_t + \ln \beta_2 \text{Mint}_t + \ln \beta_3 \text{Money}_t + \ln \beta_4 \text{Pop}_t + \varepsilon_t$$

X_t is the nominal price of a basket of consumables in England, Flanders and Brabant respectively in year t , β_0 is a constant, ε_t is an error term to account for the influence of

⁵²⁴ See Section 3.2.4 above.

⁵²⁵ See above, p. 45 and Section 2.3.

⁵²⁶ I have had to use slightly different date ranges for England, Flanders and Brabant on account of not having Flemish basket estimates beyond 1500, and not having Brabantine mint output before 1420.

other factors. The variable $\beta_2 Mint$ represents the tale value of the combined gold and silver mint output of a country in year t . $\beta_3 Money_t$ is the total volume of the money stock of a country in t , and $\beta_4 Pop_t$ the respective population level. As was the case for the individual commodity regressions above, I have used annual data and transformed it into natural logarithms to smooth the figures, thus making this a 'log-log' regression model.⁵²⁷ The results for England are presented in Figure 3.29.

					<i>Combined</i>
<i>d. Weight (silver)</i>	0.066 (0.077)				-0.13 (0.086)
<i>Mint Output</i>		0.038*** (0.009)			0.004 (0.009)
<i>Money Stock</i>			0.086* (0.046)		0.1314*** (0.049)
<i>Population</i>				0.87*** (0.108)	0.907*** (0.133)
<i>N</i>	180	180	180	180	180
<i>R²</i>	0.0058	0.0825	0.0196	0.2860	0.3260

FIGURE 3.29

Log-Log Regression Analysis of Nominal English Basket Prices, 1351–1530

[As Figures 2.5, 2.12, 2.18, 2.25 and 3.28]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

If we examine the 'combined' column of Figure 3.29, the results suggest that these four independent variables explain 32.6% (r^2) of the basket movements between 1351 and 1530. The coefficient of interest β_4 is positive significant, suggesting that population is one of

⁵²⁷ I have not, however, offset the price data against the independent variables. I decided not to do this because it would demand that it took at least a year for prices to react to changes in population, mint output or coin weight. Spufford has argued that price reactions could follow a debasement in as little time as one or two months. See Spufford, 'Debasement of the Coinage', p. 64.

the main drivers of price trends. This relationship between population and prices is significant to the 1% level, which should offer a high degree of certainty. Equally, there is a positive and significant correlation between the money stock and the prices. However, the coefficient of the latter is considerably (0.13) lower than the former (0.907). The effect of population on price movements is 0.907, suggesting that a 1% increase in population caused the general price level to increase by 0.907%. In contrast, a 1% change in the money stock only led to a 0.13% increase in prices.⁵²⁸

When the independent variables are considered separately, population remains the most important driver of prices, accounting for 28.60% of price movements. The second most important factor in determining price movements is mint output, which explains just 8.25% of price fluctuations. The effect of mint output is also far lower, with a 1% increase in mint output inflating prices by 3.87%. The impact of money stock is far less significant, only within the 10% level. Its r^2 is a very low 1.96%, though its coefficient is slightly stronger than the mint output. The weight of the English penny, i.e. the rate of debasement, is shown not to have had a significant impact on general price levels. The conclusion is clear: population was by far the most important factor in determining basket price trends in England, but other factors were also important. The failure of all four variables to explain even half of the price trends suggests that a number of other, perhaps less quantifiable, factors were at play, such as the political factors discussed in Section

⁵²⁸ However, there are deficiencies in the money stock estimates, notably the amalgamation of the gold and silver currencies. See p. 85 above.

3.2.4. Most importantly, the role of money was clearly not ‘neutral’ as the Postan demographic theory would suggest.⁵²⁹

In Flanders and Brabant, the regression analysis paints a rather different picture.⁵³⁰ Figure 3.30 shows that when all the independent variables are combined, the overall r^2 is 43.63% which, given that the debasement of the penny explained 67.55% of basket price movements when regressed alone, suggests the independent variables tended to offset each other. Unlike England, here the population coefficient becomes negative—when population decreased, prices increased, and vice versa. Though this appears counter-intuitive, it is possible that the availability of money was tight enough that fluctuations in population caused a noticeable change in the amount of currency per capita. Thus, a decline in population would increase money per capita and inflate prices. However, it is also possible that this is the result of multicollinearity, a phenomenon that can arise when highly correlated variables are included in a combined regression.

When the independent variables are regressed separately, Figure 3.30 shows that the declining weight of the penny *groot* remains the most important variable for determining price movements, explaining 67.55% of basket trends. The coefficient shows that a 1% increase in the weight of the penny *groot* could cause a 0.631% decrease in prices. This inverse relationship is precisely what we would expect to see if the markets were responding to alterations to the coinage. The second most important variable was mint output, which explains 17.70% of general price fluctuations, yet the coefficient demonstrates that a 1%

⁵²⁹ See p. 18 above.

⁵³⁰ The regression analysis for Flanders and Brabant uses the same formula as for England, though without $\ln\beta_3\text{Money}_t$ because there are no money stock estimates for the southern Low Countries.

increase in mint output only caused a 0.01% increase in prices.

			<i>Combined</i>
<i>d. Weight (silver)</i>	-0.631*** (0.032)		-0.66*** (0.104)
<i>Mint Output</i>		0.01*** (0.022)	-0.015 (0.022)
<i>Population</i>			0.04 (0.443)
<i>N</i>	131	82	127
<i>R²</i>	0.6755	0.1770	0.0001

FIGURE 3.30

Log-Log Regression Analysis of Nominal Brabantine Basket Prices, 1420–1530

[As Figures 2.5, 2.16, 2.21 and 3.28]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

Similar conclusions emerge from the regression of the Flemish basket of consumables, Figure 3.31. Like Brabant, when all of the independent variables are combined, the debasement of the penny *groot* was still the most significant independent variable for determining price movements in Flanders. However, the strength of the coefficient is weaker than it was for Brabant—a 1% rise in its weight caused just a 0.021% decrease in prices. When the independent variables are regressed individually, the debasement of the penny *groot* remains the most important variable in explaining price movements, with 27.11% of price movements being explained. Here a 1% increase in the penny’s silver weight could cause a 0.347% decrease in prices. On an individual basis, population also plays a significant role, yet the r^2 is a rather small 2.43%. Mint output explains just 2.5% and, like population, is only significant to the 10% level. Indeed, compared to Brabant, the r^2 of all

independent variables is lower for Flanders.⁵³¹ The coefficients are also far lower, indicating that changes in the independent variables caused less dramatic reactions to the Flemish basket of consumables prices.

				<i>Combined</i>
<i>d. Weight (silver)</i>	-0.347*** (0.053)			-0.021*** (0.007)
<i>Mint Output</i>		-0.028* (0.14)		-0.29 (0.391)
<i>Population</i>			-0.531* (0.306)	-0.276 (0.358)
<i>N</i>	150	123	131	103
<i>R</i> ²	0.2711	0.0250	0.0243	0.1197

FIGURE 3.31

Log-Log Regression Analysis of Nominal Flemish Basket Prices, 1400–1500

[As Figures 2.5, 2.16, 2.21 and 3.28]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

The regression analyses of the baskets of consumables have offered some general conclusions and confirmed many of the findings seen in the analysis of individual commodity price trends. They have shown that England was unique in that her prices had a positive relationship with fluctuations in population levels. The impact of monetary factors was not insignificant, however, with mint output and money supply still playing a very minor role in price movements. As was suggested at the end of Section 3.2.2, it is again probable

⁵³¹ Munro suggests that this was because the Flemish commercial economy was more subjected to supply shocks than the Brabantine economy. See Munro, 'Mint Outputs, Money, and Prices', p. 45. Unger has suggested that coastal towns in Holland suffered worse than inland towns during times of dearth because sea trade integration was weaker than overland trade integration. R. W. Unger, 'Feeding the Low Countries Towns: The Grain Trade in the Fifteenth Century', *Revue Belge de Philologie et d'Histoire*, Vol. 7, No. 2 (1999), p. 338. This view is also supported in Dijkman, *Shaping Medieval Markets*, p. 300. She suggests that Brabantine prices could also have been further flattened by the fact that in Brabant, prices were derived from monetary rent valuations, which could have behaved differently from the general market.

that it was England's abnormally stable currency that enabled it to be uniquely influenced by the unusually sluggish population recovery after the Black Death. These findings thus both vindicate and challenge the Postan thesis. On the one hand, it is clear for England that population was statistically the strongest driver of most commodity price trends in the long term. Yet my findings also challenge the Postan thesis in two ways. First, they show that even though Postan largely treated money as 'neutral', and indeed the lack of debasement and corresponding currency stability in England could have reasonably led him to this assumption, I have found that mint output and—in the case of the basket of consumables—the size of the money stock did play a role in long-term price determination. Where traded goods were concerned, debasement played an important role in the long-term trend of prices. Second, Postan's view has also been challenged because it is now clear that even in the case of population depression, the economic effects of such demographic change could be offset by a change in the debasement policy. We have seen that in Flanders and Brabant the heavy debasement of the late fourteenth century caused price inflation, even though the population was still depressed following the Black Death. It is therefore clear that my comparative approach has exposed the uniqueness of England's prolonged demographic decline, and demonstrated that its economic effects were by no means representative of those felt by her trading partners.

The interaction between the money stock and the size of the population was very complex in the southern Low Countries. In Flanders and Brabant, population levels could have had an inverse relationship with prices, suggesting that the amount of money in circulation was quite tight, and a minor change in population could have a significant

effect on the per capita money stock. This is further emphasised by the minor effect of mint output on price trends. But, as was the case for so many individual commodity price trends, the strongest and most significant determinant of price trends in Flanders and Brabant was the weight of the penny *groot*. However, unquantifiable ‘real’ factors have been excluded from the regression analysis, yet in none of the cases could the combined r^2 account for all the price movements. Section 3.2.5 showed that unquantifiable shocks, like political, trade and civil conflicts probably played some part in commodity price trends. This must surely have remained the case for the general price trends shown in the baskets of consumables.

Though Scotland’s baskets of consumables were not able to contribute to the regression analysis on account of scanty data, the conclusions that have arisen from Flanders and Brabant tie in with the results found through individual commodity analysis. Debasement played a clear role in the majority of Scottish price trends. Mint output was less clearly important, with the statistical analysis possibly damaged by a lack of data. It is clear, however, that the experience of Scotland’s economy in the post-Black Death period was more in line with that of the southern Low Countries than England.

3.4 FUTURE WORK

This chapter has sought to test the extent to which demographic, monetary, environmental and political factors influenced commodity prices in the post-Black Death period. It has found that a great deal of medieval price trends can be explained by these factors. However, it has also become clear that none of these factors—alone or combined—can entirely explain all price trends, and there are still many oddities within the data which

would benefit from further work.

For Scotland, we are left wondering why cheese prices did not show inflation in the 1480s [Figure 3.7], even though many other commodity prices became more expensive on account of the harvest failure depressing the overall food supply. Scottish wheat prices were unusually inflationary in the 1370s [Figure 3.2]. This might have been the result of the break of parity with the English sterling, because it would have made wheat exports from England more expensive, though we cannot be sure because prices were back to ‘normal’ in the subsequent decade. There is also a great variation between Scottish herring and Scottish salmon prices [Figures 3.5 and 3.6]. Salmon prices were far more prone to consistent price inflation than herring prices. Salmon was a very important part of the Scottish economy. However, its importance to Scotland was more than just as a traded commodity—the reliable demand for salmon on the international market meant that salmon came to be used as a form of *de facto* money or payment in kind. Debt could be backed with salmon and whole lines of trade credit could also be tied to it.⁵³² Once barrelled salmon had become more popular in the latter half of the fourteenth century, trade could expand and the durability of the fish could further its use as a form of ready money. To act as a form of ready money, salmon prices needed to be predictable. Thus, in 1487, the barrel was standardised at 14 gallons and in 1489 the Hamburg barrel was also standardised.⁵³³ It is possible that the variation between herring and salmon prices in Scotland might have been the result of salmon’s function as *de facto* currency, but only a detailed

⁵³² Gemmill and Mayhew, *Changing Values*, pp. 306–8.

⁵³³ *RPS*, 1487/10/20; *RPS*, 1489/1/5.

specific study of its relationship with the money stock would reveal the answer.

Though far fewer in number on account of the greater availability of economic data, there are also oddities in the Flemish and Brabantine price data that are difficult to explain with certainty. It is unknown why Flemish cheese prices showed protracted decline in value over the course of the fifteenth century, even though cheese prices in Brabant were—like most other commodities—inflationary in this period [Figure 3.7].

In England, we noticed that many commodities showed a period of mild price inflation during the bullion famine. This was particularly clear in the price trends of barley, wheat and oats [Figures 3.1, 3.2 and 3.3]. This might have been partly caused by the importation of debased petty change from Scotland, which was a particular issue in this period,⁵³⁴ but again, we cannot be sure without a more detailed investigation into the unauthorised clandestine measures taken against a probable shortage of small change in this period.

It is apparent that there are still a number of instances of fluctuations in the price data that cannot easily be explained. We must therefore accept that, while the use of statistical analysis and the examinations of the environmental and political situations in late medieval England, Scotland and the southern Low Countries have told us a great deal of what was driving medieval prices, there is still plenty of scope for further work on the subject. It would be foolish, however, to presume that it is possible to account for every price fluctuation—a finite (and sometimes highly limited) amount of medieval

⁵³⁴ See above, p. 190.

price data is vulnerable to an almost infinite number of potential driving forces. Some of these forces were the large monetary, demographic, environmental and political factors that have been examined in this chapter; others might have been as undetectable as the seller charging the buyer an unfairly high price, perhaps despite any favourable price-depressing factors, because of a poor business relationship. For another example, perhaps prices were not always reduced as much as they should have been in a year of bountiful harvest because the price was derived from the previous year, when crop yields were poor. A limited amount of available data leaves the entire price series at the mercy of such undetectable factors.

3.5 CONCLUSION

This chapter has tested—as much as possible—the impact of demographic, monetary, environmental and unquantifiable political factors on commodity price trends. Though there are exceptions to any generalisation, it has found that there are a number of fairly strong conclusions. Above all, it is clear that England's experience of price trends in the post-Black Death period was not typical of Scotland, Flanders and Brabant. In England, prices were unusually flat, or even deflationary. Elsewhere, there was far more inflation in the fifteenth century.

Regression analysis has suggested that the long-term price trends in England are consistent with the depressed population levels in the fifteenth century. In contrast, it showed that the inflation elsewhere was more in line with the frequent debasement of the Scottish, Flemish and Brabantine currencies. However, in the same way that debasement does not explain all the price trends in Scotland and the Low Countries, population

levels do not account for all the variations in English commodity prices—mint output and the money stock still had a level of importance, and debasement proved significant for traded commodities. For grain prices, it was seen that weather had clear short-term effects on prices, but crop yields had more than a long-term minor role only for wheat. This was probably because it was the most difficult crop to grow reliably, and its increasing popularity in the fifteenth century increased demand pressure on the inconsistent supply. Yet, it was this demand pressure which was found to have been the reason behind the high volatility of Scottish oat prices, which suggests that no matter how reliable the supply of a grain might have been, mercilessly inelastic demand pressure could exacerbate shortages and cause prices to be far more reactive than they would otherwise have been. Finally, this chapter highlighted the importance of unquantifiable price drivers—namely the political, trade and civil conflict shocks which had the potential to have contributed to price trends.

Crucially, examining the English price data within the context of her trading partners has highlighted that England's long-term price trends were driven more clearly (and statistically) by demographic factors than monetary factors. Yet this was not a complete vindication of Postan's treatment of money as neutral, because there was a clear role played by mint output and the size of the money stock. It is also important to remember that the nature of data availability has meant that the monetary theory might not have been allowed as fair a consideration as the demographic theory. Though we have a good amount of mint output data for England, the same is not true for Scotland, where there

are large periods of missing records. This has prevented the quantity theory from receiving the same level of statistical testing on the Scottish price data than was afforded to England and the southern Low Countries. Furthermore, though there has been a good deal of scholarship on the estimates of the English money stock, no such estimates have been constructed for Scotland and the southern Low Countries. Therefore, it is even more difficult to ensure that the true impact of monetary forces has been fully considered. Finally, it is also necessary to consider the strong possibility that it was England's unique resistance to debasement which enabled its unusually sluggish post-Black Death population recovery to play a far greater role in price trends than might otherwise have been possible. In the southern Low Countries, where debasement was frequent, there was a far lower link between population levels and price trends. Thus, while this chapter has emphasised the uniqueness of England's price trends in their vulnerability to demographic forces, it is with a number of caveats that this conclusion is offered.

CHAPTER 4: RENTS AND WAGES

Chapters 2 and 3 have shown that England was far from typical of the economies in the western North Sea region: England's currency remained strong, the population was slow to recover from the Black Death, and commodity prices followed a unique trend of stagnation and deflation throughout the late fourteenth and fifteenth centuries. It has become clear that population was the main driver of long-term price trends in England. The impact of debasement and mint output on English commodity prices was generally less significant, whereas in Flanders, Brabant and Scotland debasement—and, to a lesser extent, mint output—was highly correlated with rampant inflation. Commodities, labour and land were the three primary things that money could buy in the late medieval period, and therefore this chapter serves to complete the examination of the impact of monetary and demographic factors by analysing rent and wage trends in England, Scotland and the southern Low Countries. First, however, it is necessary to briefly outline some of the complexities in rent and wage data that were not present in commodity data.

Medieval rents were complex, far more so than commodity prices. They also have a key difference from commodities: the supply of land is relatively inelastic, whereas the supply of commodities can be adjusted on a seasonal basis to reset the supply and demand equilibrium should there be a significant drop in population or demand. Yet there were still ways to offset some of the damage to land rents that a fall in population could cause: in England and the Low Countries there was a widespread conversion of arable land to pastoral. This came earlier in England, occurring towards the end of the fourteenth century as landowners attempted to offset the fall in grain prices and rise in wages—pastoral

land yielded high-value meat and wool and required less labour than arable.⁵³⁵ In Flanders, the conversion to pastoral land only became serious in the middle of the fifteenth century.⁵³⁶ Scotland, on the other hand, was a country predominantly focused on pastoral farming, due to the poor quality of land, which did not lend itself to growing unreliable crops.⁵³⁷

Unlike commodities, rents and wages were further complicated by whether or not they were paid in cash. Mayhew has suggested that rents and labour were not part of the general price level because rent and labour payments in kind could have contributed to V in the Fisher Identity.⁵³⁸ To test the impact of the monetary theory on rent and wage levels, we must therefore ask to what extent they were paid in cash in England, Scotland and the southern Low Countries.

After the Black Death, there was a widespread collapse of servile tenure in England.⁵³⁹ Consequently, by the fifteenth century, land was largely leased on the basis that tenants were 'free', and therefore rents tended to be paid primarily in cash.⁵⁴⁰ In Scotland the

⁵³⁵ Britnell, *Commercialisation*, p. 158; M. Bailey, *Medieval Suffolk: An Economic and Social History, 1200–1500* (Woodbridge, 2007), p. 214. Dyer suggests the renting of arable land before pastoral, see C. Dyer, 'A Suffolk Farmer in the Fifteenth Century', *Agricultural History Review*, Vol. 55, No. 1 (2007), p. 2.

⁵³⁶ Nicholas, *Medieval Flanders*, pp. 267–8; R. P. Brenner, 'The Low Countries in the Transition to Capitalism', in P. Hoppenbrouwers and J. L. van Zanden (eds), *Peasants into Farmers?: The Transformation of Rural Economy and Society in the Low Countries (Middle Ages–19th Century) in Light of the Brenner Debate* (Turnhout, 2001), p. 330.

⁵³⁷ Grant, *Independence and Nationhood*, pp. 62–3.

⁵³⁸ Mayhew, 'Prices in England', p. 13.

⁵³⁹ For example, in Walsham-le-Willows (Suffolk), 33 tenants failed to turn up for winter work in 1353, and another 11 refused to undertake reaping during the harvest. Bailey, *Decline of Serfdom*, p. 73. See also R. H. Hilton, 'Economic and Demographic Factors in the Decline of Serfdom', in R. H. Hilton (ed.), *The Decline of Serfdom in Medieval England* (London, 1969), pp. 32–43.

⁵⁴⁰ Hilton, 'Economic and Demographic Factors', p. 32.

story was slightly different. Cash rents formed a part of the rents for Coupar Angus tenants, but it was also common for them to owe some sort of service to the Abbey, which came in a number of forms. For example, some tenants were expected to provide fishing equipment to the Abbey, transport peat, or supply reapers at harvest times.⁵⁴¹ In Flanders, there was less of a culture of tenant service. Nicholas notes that it was completely absent from the reclaimed lands from the twelfth century onwards, but even before, the services had not been significant.⁵⁴² This is not to say that service was non-existent, and there is evidence of some tenants paying their rents with goods or service in the southern part of Flanders.⁵⁴³ Labour service was not the only form of payment in kind—goods were sometimes used. In Scotland, the Coupar Angus rentals show that in the majority of cases tenants were obligated to pay part of their rent in an amount of grain, fowl or cattle, which the editor of the data supposes was the result of a shortage of coin in the countryside.⁵⁴⁴

These observations about the varying prevalence of cash rents also largely apply to wages. Though cash wages were a key component of English wages, payment in kind was still a minor part of English labour after the Black Death, though it has mostly been excluded by historians who have compiled the great wage rate indices.⁵⁴⁵ Payment in kind

⁵⁴¹ *Cupar-Angus*, i, p. xxvi.

⁵⁴² Nicholas, *Medieval Flanders*, p. 105.

⁵⁴³ L. Vervaeet, 'Lease Holding in Late Medieval Flanders: Towards Concentration and Engrossment? The Estates of the St John's Hospital of Bruges', in F. Aparisi and V. Royo (eds), *Beyond Lords and Peasants: Rural Elites and Economic Differentiation in Pre-Modern Europe* (Valencia, 2014), p. 123.

⁵⁴⁴ *Cupar-Angus*, i, p. xxvi. Payments in kind had the added benefit of insulating both the landlord/employer and tenant/employee from the effects of inflation.

⁵⁴⁵ J. Hatcher, 'England in the Aftermath of the Black Death', *Past and Present*, No. 144 (1994), pp. 20–1.

was even less common in the southern Low Countries, where it was even forbidden by some guilds.⁵⁴⁶ As was the case for rents, Scottish society was much more tolerant towards payment in kind, and many of the Scottish jobs in this thesis came with a non-cash element—for example, at Coupar Angus the labourers were paid with both cash and an allowance of food.⁵⁴⁷

It is clear that there is enough cash involvement in both rents and wages to justify their inclusion in the analysis of the demographic and monetary theories. Their inclusion in this thesis, particularly rents, makes this study more rounded than other analyses of the demographic and monetary theories. Rents—and, to a lesser extent, wages—have not typically enjoyed the same attention from the more quantitative monetary historians, like Munro, and thus have not been subjected to regression analysis and other statistical testing.⁵⁴⁸ In the historiography, though rent, wage and price trends are interconnected, rent trends have generally been used as markers for social change or changing economic output, rather than to discern the importance of monetary drivers.⁵⁴⁹ It is understandable, therefore, that quantification of the relationship between rents and wages, and monetary and demographic factors has not been attempted in the same manner as it has for prices.

⁵⁴⁶ Munro, 'Wage-Stickiness', p. 203.

⁵⁴⁷ *Cupar-Angus*, i, pp. 304–14.

⁵⁴⁸ Any detailed analysis of rents is absent from all Munro's work, including that which specifically looks at the impact of mint outputs and debasement on prices and wages. See, for example: Munro, 'Mint Outputs, Money, and Prices', pp. 31–122; Munro, 'Before and After the Black Death', pp. 335–64. Clark employed regression analysis for the study of wages and living standards in the medieval period, though it was not used to test the effect of debasement and mint output. See Clark, 'Long March'.

⁵⁴⁹ For example, Bailey notes that the development of the Breckland area in East Anglia was the result of a combination of factors, but social structures, property relations and demographic forces played a key role. See Bailey, *Marginal Economy?*, p. 321.

Furthermore, none of the current works on rents has included a comparison of rent levels between different countries.⁵⁵⁰ This chapter seeks to rectify these issues. By comparing England with Scotland and the southern Low Countries, this chapter offers an original approach to the understanding of medieval rent and wage levels. Employing regression analysis and correlation coefficients enables us to discern the causal relationship of demographic and monetary factors on rents and wages, demonstrating the extent to which the conclusions of Chapter 3 are repeated.

This chapter is divided into two halves. The first examines rents. It begins by setting out the main datasets for English rents compiled by other economic historians, and constructing combined rent series for arable, meadow and mixed-use land. It then does the same for Flanders, dividing the rent data into coastal and sandy land. The long-term rent trends of England and Flanders are then compared, and regression analysis is used to quantify the impact of demographic and monetary factors. Anecdotal evidence from Scotland is used to supplement the conclusions. The second half of the chapter focuses on wages. It again looks at the main known datasets for wages and compiles broader time series, separating the data into skilled and unskilled labour. Regression analysis is then used to test the quantitative impact of demographic and monetary factors. As with rents, anecdotal evidence from Scotland contributes to the findings. Finally, the chapter dedicates a section to a brief analysis of real wages.

⁵⁵⁰ Clark, 'Microbes and Markets'; Bailey, *Marginal Economy?*; Bailey, *Decline of Serfdom*, pp. 148–68; T. Soens, 'Floods and Money: Funding Drainage and Flood Control in Coastal Flanders from the Thirteenth to the Sixteenth Centuries', *Continuity and Change*, Vol. 26, No. 3 (2011), pp. 333–65; Vervaeke, 'Lease Holding', pp. 111–38.

4.1 RENTS

4.1.1 COLLATING THE DATA

4.1.1.1 ENGLAND

English rent data has received a great deal of attention from historians, who have used it to furnish analyses of manors and counties. Rents are often studied on a more micro, local history level.⁵⁵¹ In order to collate the data and gain an impression of general rent levels in England (and compare trends with Flanders and Scotland), it is necessary to look briefly at regional variations in rent prices.

There is only one large macro survey of English rent data, which has been constructed by Gregory Clark, and it covers 52 manors using a combination of data from southern England. It draws on manorial records from East Anglia, but also the Home Counties, parts of the West Country, Oxfordshire and Cambridgeshire.⁵⁵² The greatest number of entries by far comes from Suffolk, followed by Oxfordshire, Norfolk and Hampshire.⁵⁵³ It thus gives a general overview of rents across southern England.⁵⁵⁴ His data consists of three series: general rents (which is displayed as an average and includes houses, cottages and other dwellings), arable land and meadowland, thus offering a comparison between

⁵⁵¹ Many historians have offered series of rent data, but the ones used here are from: Davenport, *Norfolk Manor*, p. 78; Clark, 'Microbes and Markets', p. 11; Bailey, *Marginal Economy?*, pp. 228–9, 268–9; Bailey, *Decline of Serfdom*, pp. 166, 172, 175.

⁵⁵² For a full list of the included areas, see Clark, 'Microbes and Markets', pp. 9–10.

⁵⁵³ Clark, 'Microbes and Markets', p. 11. My thanks to Professor Gregory Clark for allowing me to use his raw data files of rent data used in 'Microbes and Markets'. Clark's data is an amalgamation of manorial data and charters.

⁵⁵⁴ There is a small amount of work on northern rents. See A. J. Pollard, 'The North-Eastern Economy and the Agrarian Crisis of 1438–1440', *Northern History*, Vol. 25, No. 1 (1989), p. 94 for the net rents of the FitzHugh estates between 1432 and 1449. The figures show a mixture of stagnation and decline.

different types of rents [Figure 4.1].⁵⁵⁵

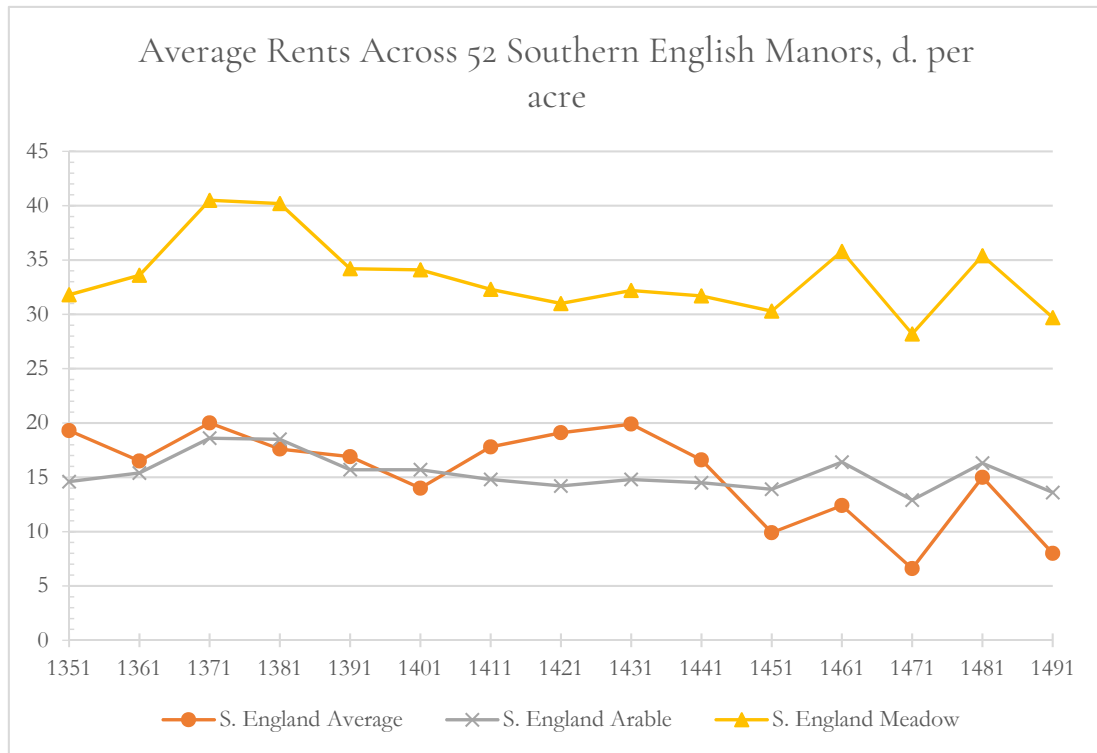


FIGURE 4.1
[Clark, 'Microbes and Markets', p. 11.]

Clark's rent data shows that, after the general rise in rents from the 1350s to the 1370s, the trends followed a gradual decline from the late fourteenth century and throughout the fifteenth century. Meadowland was clearly much more expensive than arable in absolute terms, sometimes commanding double the price. In terms of gauging general trends of decline, however, a simple glance at the data is insufficient. It is possible to gauge which type of land declined the most by applying a linear line of best fit to each series, and then using the equation for this line to obtain the gradient, Figure 4.2. The

⁵⁵⁵ Meadowland was often more expensive than arable land and was of superior quality to pastoral land. Meadowland was good enough quality that it could be both mown for hay and used for animal grazing. Postan, *Medieval Economy*, p. 60; Bailey, *Medieval Suffolk*, p. 91; T. Williamson, *Shaping Medieval Landscapes: Settlement, Society, Environment* (Bollington, 2004), pp. 163–75.

series with the largest negative gradient shows the greatest absolute decline over the period. The first column dictates the date range used for the calculation. I offer the data with both the period from the 1350s to the 1370s included and excluded because, as Figure 4.1 shows, this was when rents saw an increase after the initial onset of plague.

<i>Date</i>	<i>Manor</i>	<i>Land Type</i>	<i>Equation</i>	<i>Gradient</i>
1350–1500	52-Manor Average	All (inc. dwellings)	$y = -0.6771x + 20.72$	-0.6771
1350–1500	52-Manor Average	Arable	$y = -0.1654x + 16.65$	-0.1654
1350–1500	52-Manor Average	Meadow	$y = -0.3557x + 36.25$	-0.3557
1380–1500	52-Manor Average	All (inc. dwellings)	$y = -0.8126x + 19.77$	-0.8126
1380–1500	52-Manor Average	Arable	$y = -0.2143x + 16.5$	-0.2143
1380–1500	52-Manor Average	Meadow	$y = -0.4584x + 35.9$	-0.4584

Figure 4.2
The Rate of Decline of Southern English Rents
[Derived from Figure 4.1]

First, it is clear from looking at the gradient column of Figure 4.2 that the general picture of southern English rent levels was one of decline throughout the late medieval period. The average of all rents including dwellings shows the most significant decline over the period and this decline, as expected, becomes more pronounced when the period before 1380 is excluded. This picture is further clarified when the percentage decline of each rent series is calculated. Taking the difference between two averages (the periods from the 1380s to the 1400s and from the 1460s to the 1480s), Clark's average of all rentals shows a decline of 29.9%. It makes sense that rentals which included dwellings declined faster (and differently) than ordinary farming land because peasant labourers who were enjoying a better income after the Black Death could make use of more land with which

to grow food or keep animals, but there was little point in owning numerous houses. Thus, the demand ceiling of property was lower than farmland, and a glut of both was more detrimental for the value of housing. Second, the cost of arable was more stable than meadowland, which seems odd since there was a mass conversion from arable to pastoral after the Black Death—in Essex the amount of pastoral land increased by almost threefold from the early fourteenth century to the end of the fifteenth.⁵⁵⁶ Clark suggests that arable remained more resilient to decline because the best quality land was kept for arable, and the surplus was converted to pasture.⁵⁵⁷ Thus the supply of arable was limited, while the market was flooded with pastoral land, depressing its value. Meadowland experienced a similar shift in usage. Its quantity increased almost twofold in Essex from 1272–1307 to 1461–85.⁵⁵⁸ These conversions to pastoral and meadowland protected arable land's exposure to the demographic decline caused by the plague, but accentuated meadowland's exposure to it. However, though arable was more stable in absolute terms, in percentage decline there was little difference between arable and meadowland. Between the 1380s and the 1400s and from the 1460s to the 1480s, arable and meadow only declined by 8.6% and 8.4% respectively. This shows that southern English lands were still suffering from a general decline.

Clark's data gives a good general overview of rents in southern England, but the south of England's fortunes after the Black Death were not consistent—some areas fell into decline while others prospered. East Anglia generally did rather well after the Black

⁵⁵⁶ Poos, *Rural Society*, p. 47.

⁵⁵⁷ Clark, 'Microbes and Markets', pp. 10–12.

⁵⁵⁸ Poos, *Rural Society*, p. 47.

Death, unlike other areas (such as Winchester, York and Bristol) which suffered from decline.⁵⁵⁹ Bailey has found that the Breckland area in East Anglia, though fulfilling the basic definition of being a marginal area on account of its poor soil quality, certainly did not suffer from more severe decline than non-marginal areas in the fifteenth century. There were a number of factors behind Breckland's survival in the fifteenth century—proximity to markets, willingness to adapt land use, landlords readily converting tenancies to leaseholds, and whether peasants were willing to remain in the area.⁵⁶⁰ The poor quality of the soil meant that the Breckland area tended to focus on pastoral farming, producing wool—though inferior to the finest of English wool—dairy products and, later, rabbit fur and meat.⁵⁶¹ Combined with its fortunate proximity to East Anglian trade networks—such as Bury St Edmunds and Colchester—and blessed with river access to the Great Ouse (and thus the sea), this area of marginal land was able to resist any unusually significant decline in the post-Black Death period.⁵⁶² For the purpose of gauging the impact of the big European crises of the bullion famine and mid fifteenth-century slump, the Breckland area is a sound choice; its reliance on pastoral farming left the local economy particularly vulnerable to changes in demand for animal products, and its integration within the East Anglian commercial economy ensured that it had exposure to shifts

⁵⁵⁹ For a summary of the main areas of growth and decline, see G. L. Harriss, *Shaping the Nation: England, 1360–1461* (Oxford, 2005), pp. 273–4. See also: Britnell, *Commercialisation*, pp. 158–62; C. Dyer and T. R. Slater, 'The Midlands', in D. M. Palliser (ed.), *The Cambridge Urban History of Britain* (3 vols, Cambridge, 2000), i, pp. 625–35; D. Keene, 'The South East of England', in D. M. Palliser (ed.), *The Cambridge Urban History of Britain* (3 vols, Cambridge, 2000), i, pp. 572–82; R. Holt, 'Gloucester in the Century After the Black Death', in R. Holt and G. Rosser (eds), *The Medieval Town* (London, 1999), pp. 141–59.

⁵⁶⁰ Bailey, *Marginal Economy?*, pp. 108–18, 265–318.

⁵⁶¹ *Ibid.*, pp. 126–8, 263, 289–304.

⁵⁶² *Ibid.*, pp. 153–4, 260–3.

in mercantile fortunes. Using Bailey's rental data for the Breckland manors, Figure 4.3 offers a comparison of arable rent levels in the area.⁵⁶³

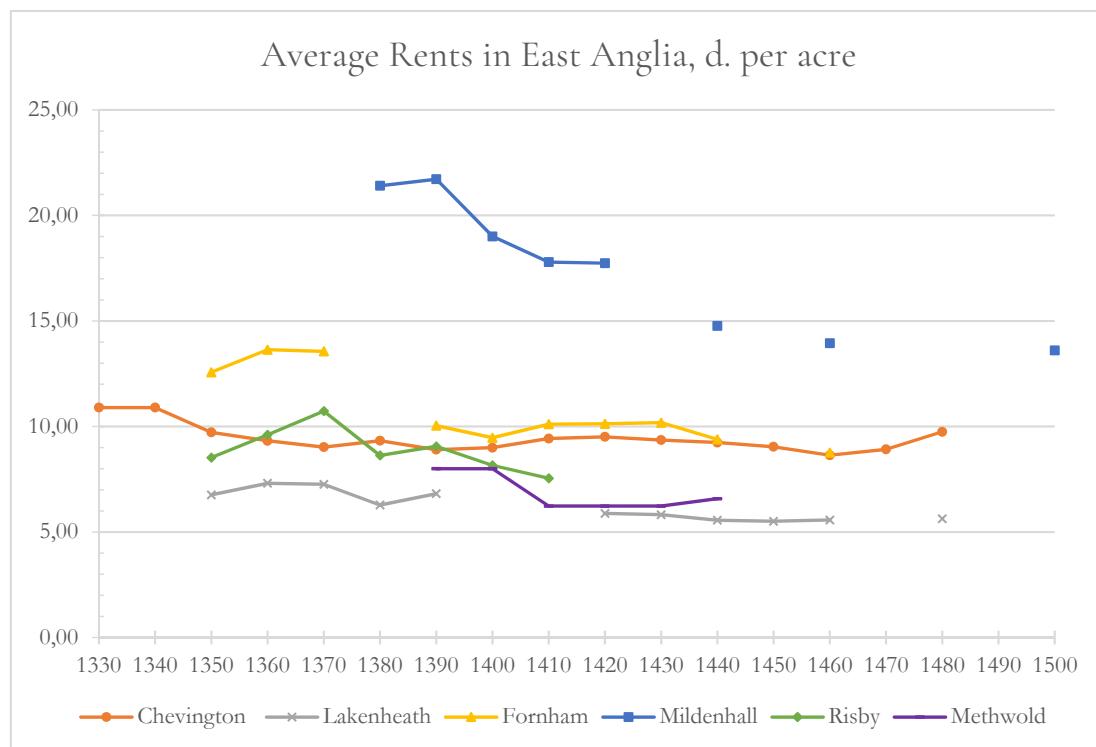


FIGURE 4.3

[Bailey, *Marginal Economy?*, pp. 228–9, 268–9; Bailey, *Decline of Serfdom*, p. 172.]

The first observation to be made in the difference between Clark's 52-manor averages and Bailey's East Anglian data is that Bailey's rents come out much cheaper than Clark's averages. This was probably because Breckland was mostly sandy heathland, and thus lower quality, and because arable farming was less significant to the local economy.⁵⁶⁴ All Breckland manors, except Mildenhall, have rents averaging well below 15d. per acre,

⁵⁶³ Bailey's data can be found: *ibid.*, pp. 228–9, 268–9; Bailey, *Decline of Serfdom*, pp. 166, 172, 175. Unfortunately, there is no rental data for pastoral land in Breckland.

⁵⁶⁴ Bailey, *Medieval Suffolk*, pp. 91, 31.

whereas this level is not reached in the Clark data until the middle of the fifteenth century, and meadowland never becomes so cheap. There does appear to have been a downward trend in the East Anglian rents after the 1370s, but it appears that only Mildenhall and Fornham suffered from serious declines. It is possible to measure the rate of rent decay for those manors whose data spreads over the majority of the period (Chevington, Lakenheath, Mildenhall and Fornham), using the method applied in Figure 4.2 above.

<i>Date</i>	<i>Manor</i>	<i>Land Type</i>	<i>Equation</i>	<i>Gradient</i>
1330–1500	Chevington	Arable	$y = -0.0787x + 10.11$	-0.0787
1350–1500	Fornham	Arable	$y = -0.426x + 13.47$	-0.426
1350–1500	Lakenheath	Arable	$y = -0.1424x + 7.24$	-0.1424
1350–1500	Mildenhall	Arable	$y = -0.7356x + 23.75$	-0.7356
1380–1500	Chevington	Arable	$y = 0.0005x + 9.19$	0.0005
1380–1500	Fornham	Arable	$y = -0.1405x + 10.45$	-0.1405
1380–1500	Lakenheath	Arable	$y = -0.1113x + 6.57$	-0.1113
1380–1500	Mildenhall	Arable	$y = -0.7356x + 21.55$	-0.7356

FIGURE 4.4
[Derived from Figure 4.3]

Figure 4.4 shows that Chevington's rents were by far the flattest over the period, and when the decades before the 1380s are excluded, the trend is slightly positive. Though Mildenhall and Fornham are the only two that suffer declines similar to those in the Clark data, it is clear that the general picture of East Anglian arable land is one of decline. There is limited use for such micro analysis, however; this thesis looks at macro trends across entire countries. Thus, it is necessary to construct an average of arable rent costs in East Anglia. Using Bailey's data, and that given by Davenport for arable in Fornsett, Norfolk, Figure 4.5 offers an overview of general arable rent costs in East Anglia. This was constructed by calculating an average of the rents for years where there was data for at least two manors. It is clear that the value of arable land in East Anglia was declining

from the 1380s onwards. By comparison with Clark's arable average's decline of 8.62%, the East Anglian arable declined by 25.06%. It is possible that the large disparity between the two datasets is either the result of Clark's data appearing unusually stable due to the inclusion of manors with especially high rents in the fifteenth century (such as the lands of Battle Abbey),⁵⁶⁵ or because arable was simply worth less in East Anglia than elsewhere. Indeed, the cost per acre was 30–50% lower in East Anglia, see Figure 4.6.

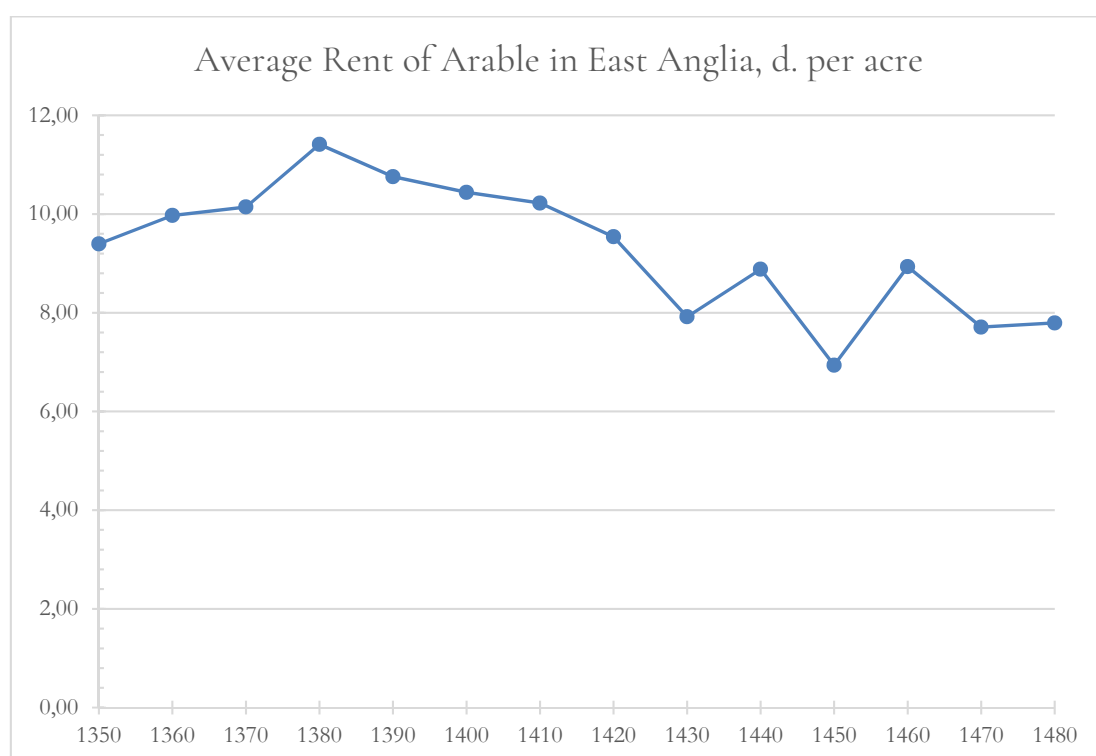


FIGURE 4.5

[Davenport, *Norfolk Manor*, p. 78; Bailey, *Marginal Economy?*, pp. 228–9, 268–9; Bailey, *Decline of Serfdom*, pp. 172.]

⁵⁶⁵ Clark notes that the rents of Battle Abbey were 2–3 times higher than elsewhere, which would have skewed the data upwards. However, most Winchester manor rents were only 60–80% of the average. See Clark, 'Microbes and Markets', p. 10. Still, inflation of rents by up to 200% from one manor more than offsets the lower rents of Winchester.

Evidently the value of arable in East Anglia varied somewhat from the general picture of arable rentals in southern England. Indeed, the two series only have a correlation of 0.58—positive and fairly strong, but still weaker than one would desire. There appears to have been no dramatic impact from a shortage of silver during the ‘bullion famine’, from the 1390s to the 1410s. Though rents did decline during this period, the decline seems more in keeping with the picture set out in the historiography, of reluctant landlords eventually succumbing to reduced demand pressure and lowering their rent prices;⁵⁶⁶ there is no clear impact of a ‘recovery’ once the bullion famine ended in the 1420s and 1430s. Relative to the 1440s and the 1460s, land value declined in East Anglia during the 1450s, precisely when there was supposed to be a slump. It appears that this slump was short lived, however, because it lasted only a decade, whereas England’s balance of payments dwindled from the 1430s to the 1460s.⁵⁶⁷ The slump might have been caused by a lack of demand for wool, which depressed land value. It could also have been caused by the widespread abandonment of sheep farming,⁵⁶⁸ which encouraged the disposal of land and therefore probably depressed land values. Though the rents are for arable, Clark’s meadow and arable series correlate to 0.99, suggesting that although prices per acre were

⁵⁶⁶ See Bailey, *Marginal Economy?*, p. 266. Davenport stated that: ‘In the early fourteenth century rents were determined by custom and not by supply and demand. But in the latter fourteenth century a large amount of land was thrown upon the market and let at competition prices’. See Davenport, *Norfolk Manor*, p. 78.

⁵⁶⁷ See p. 47 above. Bolton, *Medieval English Economy*, p. 307.

⁵⁶⁸ T. H. Lloyd, *The Movement of Wool Prices in Medieval England* (Cambridge, 1973), p. 26; E. Miller, ‘The Southern Counties’, in E. Miller (ed.), *AHEW* (8 vols, Cambridge, 1991), iii, p. 151. It has also been suggested that decline set in earlier for the East Anglian Breckland because the land was of lower quality, and cattle were not reared in substantial enough numbers—herd sizes had been falling since the 1420s—to offset problems with sheep farming. See Bailey, *Marginal Economy?*, pp. 294–5; Hatcher, ‘Great Slump’, p. 252; M. Mate, ‘Pastoral Farming in South-East England in the Fifteenth Century’, *EconHR*, Vol. 40, No. 4 (1987), pp. 527–9.

higher for meadow, both types of farmland had near identical trends. It is therefore reasonable to use the East Anglian arable trends as a proxy for East Anglian meadow trends. The poor harvests of the 1480s seem to have protected the value of arable because the rising cost of food increased the value of the land's output and, by extension, the land's value.

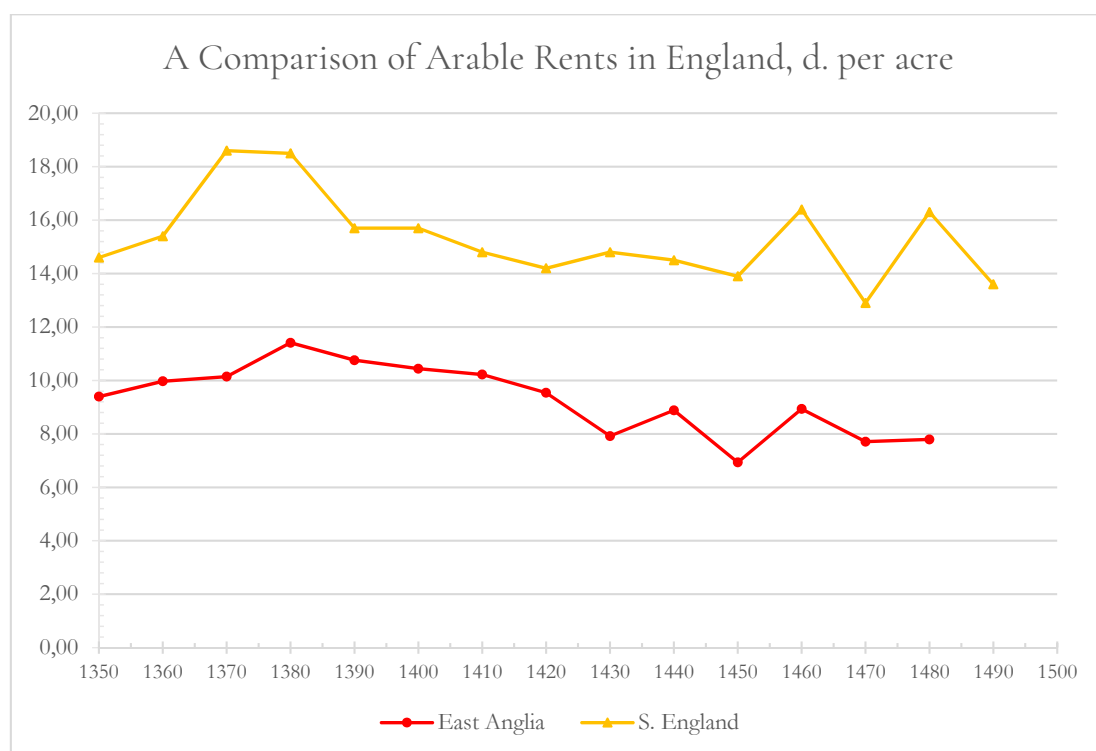


FIGURE 4.6
[As Figures 4.1 and 4.5]

A survey of the English rental data has offered a number of preliminary conclusions. First, it is clear that rents in England, like prices, declined steadily throughout the period from the 1380s to 1500; second, that East Anglian arable land values appear to have been more vulnerable to the fall in trade activity during the 1450s than the general picture of southern England rents; and, third, that the trends so far support the common idea that

land value was driven by demand, which is linked to population trends.⁵⁶⁹

4.1.1.2 FLANDERS

As with England, Flanders has had a reasonable amount of attention given to its rents, and there is again a need to assemble a series of rents offering a general overview of land values. For Flanders, Lies Vervae't's and Tim Soens' datasets are the most extensive. Vervae't's data looks at rents in the holdings of St John's Hospital, Bruges. It gives series for two different types of land: coastal and sandy.⁵⁷⁰ Though it was not the largest landowner in Flanders (the Abbeys of St Baff's, Our Lady of the Dunes and St Peter's were larger), its holdings increased in the first part of the fourteenth century as it became the recipient of many small donations of parcels of land. By 1310, it had twelve farmsteads of between 50 and 250 hectares of land each, as well as a number of individual plots of land. St John's also leased out more of its land as the fourteenth century wore on. By 1400, all but the largest farm had been leased out.⁵⁷¹

Soens' data looks more generally at the parts of Flanders that had so-called 'waterings'. These were committees set up to provide a centralised means of dealing with flood risk. Waterings would organise taxation to fund dyke building and maintenance.⁵⁷² They

⁵⁶⁹ The potential for land value to be driven by prices will be discussed below in Section 4.1.4, when the value of land output is considered in relation to rents.

⁵⁷⁰ L. Vervae't, 'Goederenbeheer in een veranderende samenleving het Sint-Janshospitaal van Brugge ca. 1275–ca. 1575' (unpublished PhD Thesis, Ghent University, 2014). Both Clark's and Vervae't's rent data spans beyond the scope of this thesis, so just data falling between 1350 and 1530 has been taken.

⁵⁷¹ Vervae't, 'Lease Holding', pp. 115–18.

⁵⁷² For Soen's detailed work on these waterings, see Soens, 'Floods and Money'; Soens, 'Flood Security'; T. Soens, *Spade in de dijk: Waterbeheer en rurale samenleving in de Vlaamse kustvlakte (1280–1580)* (Ghent, 2009).

had a direct impact on inhabitants and labourers in their areas. Consequently, the existence of these centralised organisations means that a great deal of rent and wage data is available for areas under their jurisdiction. Soens' data is more akin to the coastal data that Vervaeet has assembled, rather than the sandy lands.

Like England, Flanders also saw a general shift away from arable farming and towards pastoral. In the fifteenth century, the size of arable plots was decreasing while pastoral land expanded, owing to a higher demand for meat products.⁵⁷³ It also appears that as there was a trend towards peasants acquiring larger land holdings, more of this became pastoral.⁵⁷⁴ Though we know quite clearly what sort of land was the subject of much of the English rent data, the same is not as true for Flanders. After the widespread shift of large demesnes to leasing out their lands as individual farms, it became common for Flemish rent accounts to state simply the name of the farmer renting the land, the length of his contract and the cost.⁵⁷⁵ The St John's Hospital data is largely made up of these 'farms', which presumably came with a house and land, suitable for arable and perhaps a small amount of pastoral farming. Generally, in Flanders land was arable, and permanent pastureland was rare. Instead, cattle would be stabled and allowed to graze arable land after the harvest. Certainly pasture, whether it was temporary or permanent, would have been only a small part of the land in the Flemish rentals.⁵⁷⁶ Even though the Flemish data

⁵⁷³ Nicholas, *Medieval Flanders*, pp. 267–8.; Brenner, 'Transition to Capitalism'.

⁵⁷⁴ See L. Vervaeet, 'Every Little Bit Helps? The Leasehold of Small Parcels of Land in Late Medieval Flanders' (unpublished paper delivered 22 August 2013, Rural History, Bern); van der Wee, 'Introduction', p. 8.

⁵⁷⁵ E. Thoen, 'The Birth of "the Flemish Husbandry"', in G. G. Astill and J. Langdon (eds), *Medieval Farming and Technology: The Impact of Agricultural Change in Northwest Europe* (Leiden, 1997), p. 69.

⁵⁷⁶ This perhaps speaks of a high demand for hay and fodder crops. My thanks to Professor Tim Soens for his help with understanding the nature of the Flemish rent sources.

does not allow separation of arable and pastoral land, this is not necessarily an issue for comparison; the English rent data showed that the trends of arable and pastoral rents were almost identical—just the absolute value of land varied. What is important to gauge for Flanders is whether there was a significant difference between the rents in different parts of the coastal areas, in the same way that East Anglian rents were quite clearly cheaper than the average cost of rent in southern England. Figure 4.7 shows that there is a good deal of price disparity between different datasets, with the sandy lands south of Bruges (Maldegem and Eeklo) being the cheapest by far. Both were part of the reclaimed land from the thirteenth century,⁵⁷⁷ had a strong pastoral economy, and were situated in a prime position to benefit from trading cloth with Antwerp and Ghent.⁵⁷⁸ The Flemish coastal land was more geared towards arable farming,⁵⁷⁹ and its cost per acre outstripped that of sandy land. The fact that the coastal land was more appropriate for arable farming implies that, as suggested by the Scottish and Breckland biases towards pastoral farming, land quality dictated use. Consequently, it is reasonable to assume that the coastal land was more expensive than the sandy land because it was superior in quality—the disparity was almost certainly not caused by location because all the datasets are within close geographical proximity of one another.

A few common themes emerge from the collection of rent data. The period from

⁵⁷⁷ Nicholas, *Medieval Flanders*, p. 99.

⁵⁷⁸ Maldegem and Eeklo were two of the cloth manufacturing areas of Flanders. See Nicholas, *Medieval Flanders*, p. 279.

⁵⁷⁹ M. Buchan, G. Müldner, A. Ervynck and K. Britton, 'Season of Birth and Sheep Husbandry in Late Roman and Medieval Coastal Flanders: A Pilot Study Using Tooth Enamel $\delta^{18}\text{O}$ Analysis', *Environmental Archaeology*, Vol. 21, No. 3 (2016), p. 260.

c.1400 to the 1430s generally saw inflation of rent prices, and after peaking in the 1430s to coincide with the poor harvests,⁵⁸⁰ there was general decline of rents from the 1430s to the 1460s and 1470s. Rents increased during the poor harvest decade of the 1480s, as they had in the 1430s. The nadir for most of the datasets was in the 1490s, but thereafter the rents generally increased, much in the way of the baskets of consumables.

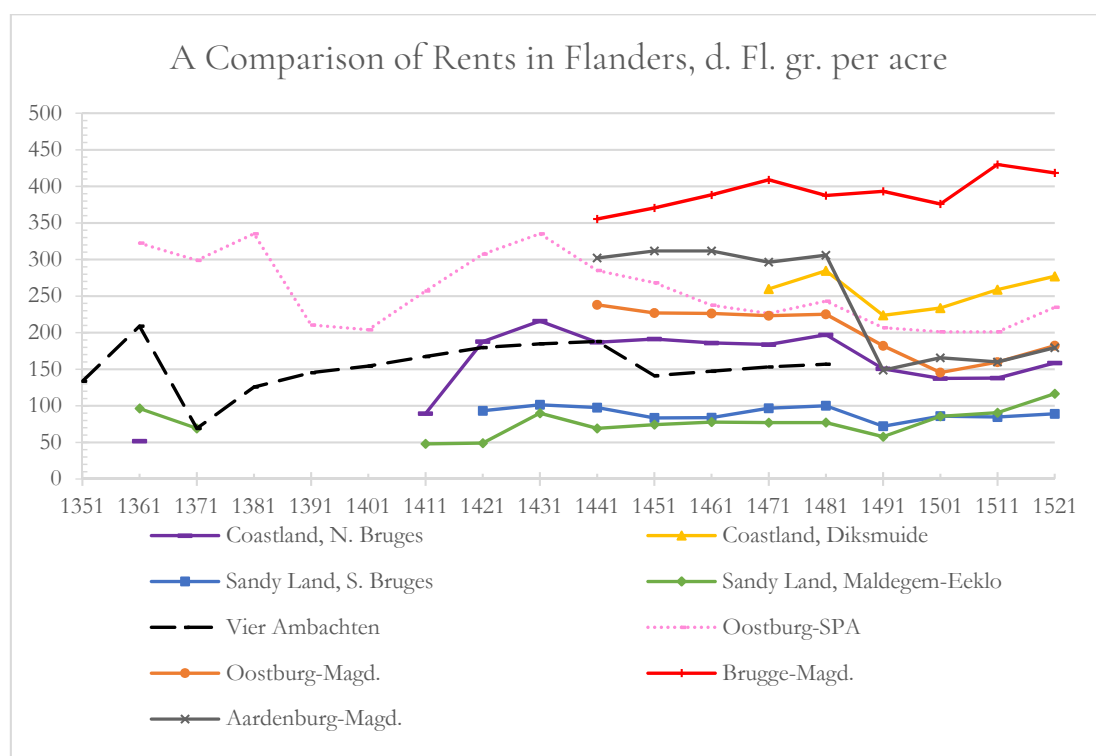


FIGURE 4.7

[My thanks to Lies Vervaeet and Tim Soens for giving me access to their respective datasets.]

However, comparing such small and specific datasets to the rents for southern England and East Anglia would be difficult. Instead, it is wiser to combine the datasets where possible to create larger series, as was done for East Anglia. Given that it is not possible

⁵⁸⁰ The 1433 money reform came with a reinforcement in the Flemish *groot* (see p. 78), so prices should have fallen if this were a key driver.

to distinguish between arable and pastoral land in Flanders, it is better to draw distinction between whether the land was coastal or sandy. Therefore, Soens' data for coastal Flanders has been merged with Vervae't's coastal rent data [Figure 4.8]. Vervae't's two series for more inland sandy land have also been combined into a single dataset.

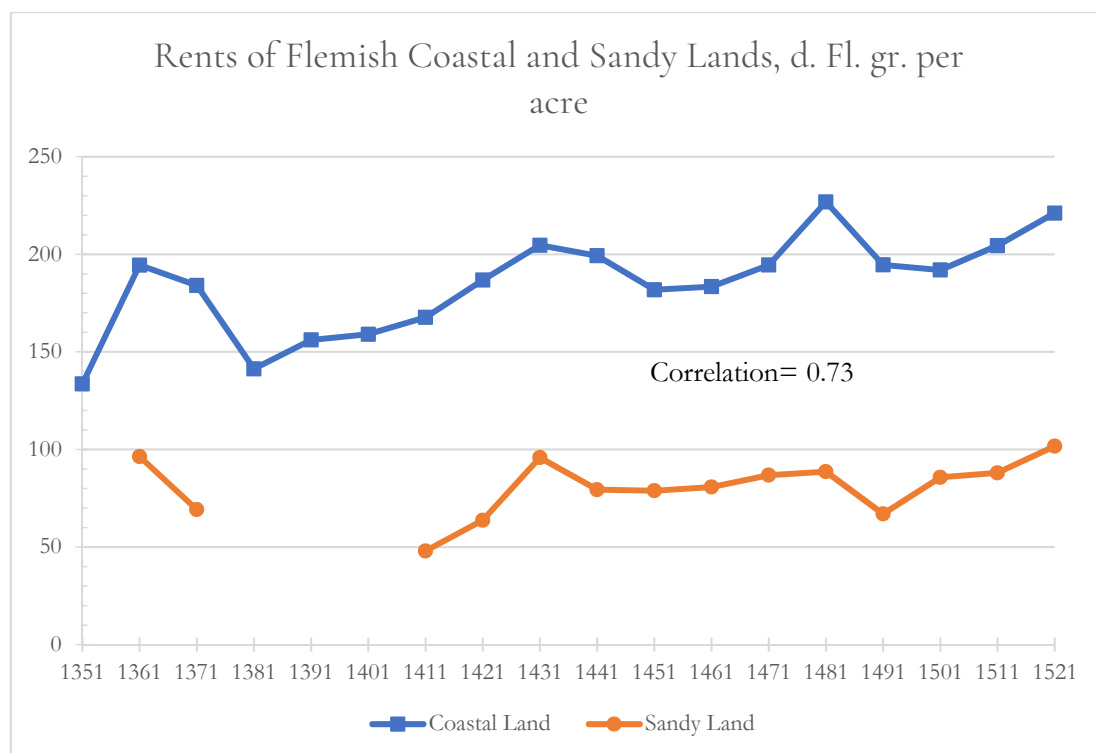


FIGURE 4.8
[As Figure 4.7]

The first observation, as was suggested by Figure 4.7, is that coastal land was more expensive than sandy land. In addition to the coastal land commanding a higher premium due to its superior fertility, it is also possible that the cost of rent in the more inland sandy areas was lower because there was a different structure of landholding. Inland parts of Flanders had longer leases and the tenants typically were freeholders with a small plot of land—small enough that they needed to supplement their income with work in the

cottage industries in the fourteenth century.⁵⁸¹ It is apparent, however, that similarly to England, the quality of the land affected only the absolute value of rents, rather than the overall trend. Even though sandy lands could be worth 50% less than the coastal lands, both trends still correlate to a strong 0.73.

To put English rents into the context of her neighbours, the Flemish data needs to be converted from cost per hectare to cost per acre.⁵⁸² Figure 4.9 below shows the nominal price trends of rents in England and Flanders, in English pennies and Flemish penny *groots*.⁵⁸³ The land included in the comparison contains a mixture of land used for arable and for pasture for both England and Flanders, so as to facilitate a fair comparison. Direct comparison of rent trends for Scotland is more difficult because the rent data obtained from the *Exchequer Rolls* and the Coupar Angus rental book seldom quantifies the land sizes beyond stating what proportion of a town/village it represented.⁵⁸⁴ This is less of an issue when the rental is for something specific, such as a mill, but in the case of rentals

⁵⁸¹ T. Soens, 'Explaining the Deficiencies in Water Management in the Late Medieval Flemish Coastal Plain, 13th–16th Centuries', in H. Greefs (ed.), *Water Management, Communities, and Environment: The Low Countries in Comparative Perspective, c.1000–c.1800* (Hilversum, 2006), p. 36; E. Thoen, 'A "Commercial Survival Economy" in Evolution. The Flemish Countryside and the Transition to Capitalism (Middle Ages–19th Century)', in P. Hoppenbrouwers and J. L. van Zanden (eds), *Peasants into Farmers?: The Transformation of Rural Economy and Society in the Low Countries (Middle Ages–19th Century) in Light of the Brenner Debate* (Turnhout, 2001), p. 114.

⁵⁸² This was done by using the ratio of hectares to acres of 1:2.47, which can be found in N. Baker and R. Holt, *Urban Growth and the Medieval Church: Gloucester and Worcester* (Aldershot, 2004), p. 307. A number of other historians provide conversions by giving land sizes in both acres and hectares, and they usually fall within several thousandths of the figure given by Baker and Holt.

⁵⁸³ At this point the currencies have been left in their original forms. Rent values per acre in grains of silver are given further down.

⁵⁸⁴ I also examined the data within the Morton Register, but it was less useful for this comparison because it was not usually apparent how large the land holdings were, nor when particular holdings came into the possession of new tenants. The data can be found in *Morton Registrum Honoris de Morton*, ed. C. Innes, Bannatyne Club (Edinburgh, 1953).

for houses or pieces of land, data suitable for comparison with the English and Flemish data is not obtainable.

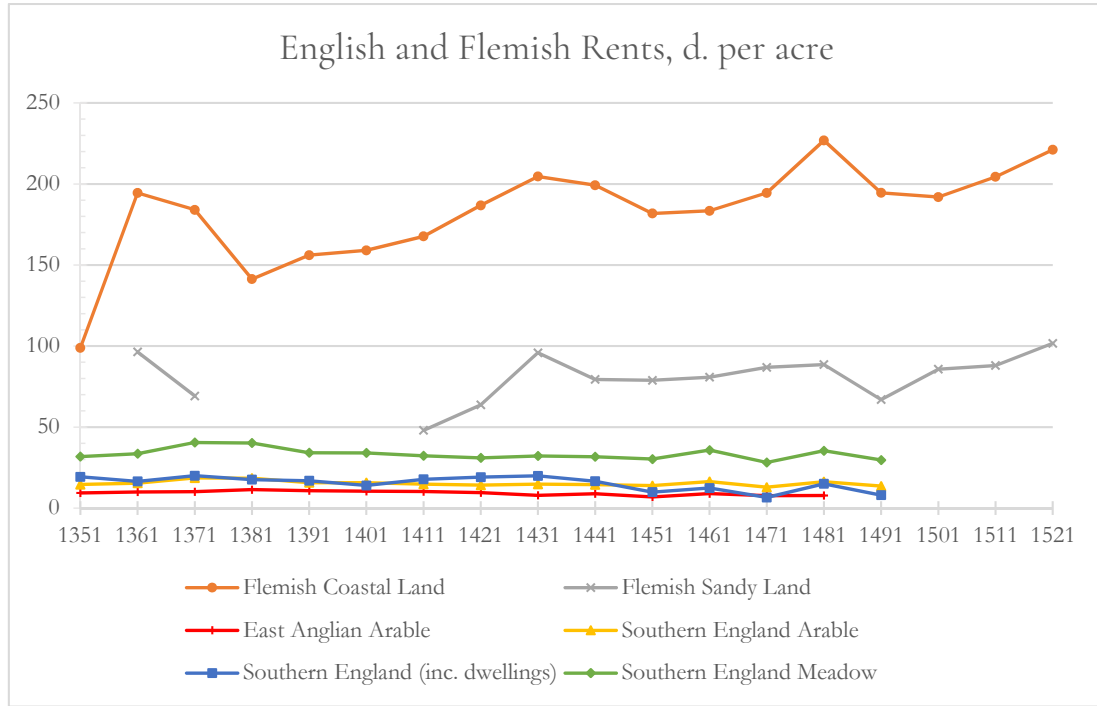


FIGURE 4.9
[As Figures 4.1, 4.5 and 4.7]

Like the basket of consumables, the general trend of Flemish rents was still one of inflation, but this varied depending on the type of land. The coastal land saw much stronger inflation, having the steepest gradient when a linear line of best fit was applied [see Figure 4.10]. The Flemish sandy land was still inflationary over the period, but much less so. In contrast, the English rents suffered from protracted deflation throughout the fourteenth and fifteenth centuries. Taking the average rent cost between the 1380s to the 1400s and comparing it with the average rent cost between the 1460s and 1480s, it is clear that Flanders' rents saw a great deal of inflation. Rents went up by 32.5% in the coastal areas, but only by 3.1% in the sandy inland areas. This forms a stark contrast to England,

where declines of between 8% and 25% were common during the same period.

<i>Date</i>	<i>Area</i>	<i>Land Type</i>	<i>Equation</i>	<i>Gradient</i>
1350–1520	Flemish Coast	Mixed	$y = 3.375x + 152.68$	+3.375
1350–1520	Flemish Sandy Land	Mixed	$y = 0.9551x + 70.141$	+0.9551
1350–1500	Flemish Coast	Mixed	$y = 3.7026x + 150.91$	+3.7026
1350–1500	Flemish Sandy Land	Mixed	$y = 0.1897x + 75.899$	+0.1897
1350–1500	Southern England	All (inc. dwellings)	$y = -0.6771x + 20.72$	-0.6771
1350–1500	Southern England	Arable	$y = -0.1654x + 16.65$	-0.1654
1350–1500	Southern England	Meadow	$y = -0.3557x + 36.25$	-0.3557
1350–1500	East Anglia	Arable	$y = -0.232x + 11.029$	-0.232
1380–1500	Flemish Coast	Mixed	$y = 5.3461x + 148.24$	+5.3461
1380–1500	Flemish Sandy Land	Mixed	$y = 2.2331x + 58.697$	+2.2331
1380–1500	Southern England	All (inc. dwellings)	$y = -0.8126x + 19.77$	-0.8126
1380–1500	Southern England	Arable	$y = -0.2143x + 16.5$	-0.2143
1380–1500	Southern England	Meadow	$y = -0.4584x + 35.9$	-0.4584
1380–1500	East Anglia	Arable	$y = -0.3821x + 11.43$	-0.3821

FIGURE 4.10
[Derived from Figures 4.1, 4.5 and 4.7]

Looking at specific decades that had proven tumultuous for commodity prices can shed further light on what was driving rents. There is a slight uptick in two sets of Flemish data in the 1430s. As discussed in Chapter 2, this was a decade of both monetary alteration (through the unification of currencies by Philip the Good in 1433) and poor weather. Poor weather could have driven up rent prices if the value of the land's output also increased, and the reinforcement that came with the 1433 monetary unification should have depressed rents slightly. Given the slight rise in rental costs in the 1430s, it appears that

weather was the more significant factor. In contrast, England's rents only moved upwards very slightly during the same decade, even though the 1430s had also been a decade of poor weather and bad harvests in England. The 1480s also saw a decade of higher rents in the coastal areas of Flanders, but not in the sandy lands. English rents also increased during this decade. Though the inflation of Flemish coastal rents in the 1480s coincided with a lagged impact from heavy debasement during the 1470s, it is unlikely that this was the cause because sandy lands were unaffected, and English arable lands followed the same inflationary trend. It is thus more likely that the period of terrible weather across Europe, which caused famines, increased the value of land that was producing the food most affected by poor weather. It is probable that the poor weather of the 1480s was able to cause rent inflation in England, even though the 1430s had not, because the weather crisis of the 1480s was more severe. This was demonstrated in Chapter 3, when it was consistently seen that the 1480s produced a dramatic increase in commodity prices. The sandy lands of Flanders were largely able to evade the impact of the poor weather because they focused more on peat extraction and sheep farming than arable.⁵⁸⁵ Only Maldegem and Eeklo had increases in their rent prices [see Figure 4.7 above]. The value of sandy land also could have been depressed by any flooding that coincided with the poor weather. Reclaimed land was more prone to flooding, which possibly explains why, even with debasement in the 1480s, the sandy lands saw very little movement in rent prices during this period.⁵⁸⁶ The English rent data stops at 1500, but the Flemish data continues into the

⁵⁸⁵ Nicholas, *Medieval Flanders*, p. 126.

⁵⁸⁶ Indeed, modern houses that are built on flood plains command lower prices than those on safer land.

sixteenth century. Flemish rents generally declined sharply in the 1490s, only to pick up again in the 1510s, increasing from that point onwards, similar to the basket of consumables and other commodity price trends.

So far, it is clear that English rents were substantially cheaper and more deflationary than Flemish rents. Flanders saw general inflation throughout the most part of the fifteenth century, though the apparent recession of the period between the 1430s and 1470s remains present in the rent data. There was variation in the absolute prices of rents depending on the quality of the land, but deviations in land quality did not trigger decorrelation of the trends. The most obvious difference between England and Flanders is the hardness of their respective currencies—is it the case that the frequent debasement in Flanders but the stable currency in England enabled their rents to behave as they did? In order to clarify the drivers behind rent trends, it is now necessary to compare rents to population, commodity prices and debasement trends.

4.1.2 DETERMINING RENT DRIVERS

Chapter 2 established the population trends of England, and offered graph data detailing the rates of debasement in England, Scotland and Flanders. Chapter 3 offered baskets of consumables for England and Flanders, and used log-log regression analysis to gauge the impact of monetary and demographic factors on commodity price trends. This same statistical testing can be used to gauge the impact of debasement, mint output, population and commodity prices on rent trends.⁵⁸⁷ Figure 4.11.1 gives the results of combined log-

⁵⁸⁷ See pp. 153, 165 and 210 for an explanation of how we would expect prices to react if population, debase-

log regression analysis, assuming that all the independent variables interacted simultaneously to drive rent prices. Unfortunately, the rent data is too inconsistent to allow for regression of annual data, so a more inaccurate regression of the decennial averages has been used. For this reason, the baskets of consumables have been included as dependent variables to act as a control.

The main observation to be made from Figure 4.11.1 is that the use of decennial averages has considerably reduced the significance of the coefficients. As was the case for many of the combined commodities regressions, multicollinearity again skews the results, as evidenced by the conflicting positive and negative coefficients of silver and gold penny weights. It is evident that the presence of multicollinearity and the smaller sample size has reduced the usefulness of combined log-log regression. Therefore, it is necessary to separate the independent variables and run individual regression tests.

Figure 4.11.2 gives the log-log regression results for the English basket of consumables, the East Anglia average from Bailey's data, and the three rent series from Clark. As is instantly clear from looking at the far greater number of significance markers, separating out the independent variables gives a lot more to work with. For the basket of consumables, mint output has the greatest r^2 , followed by population. However, the positive coefficient is far stronger for population, suggesting that, while it explained less of the decennial price trends, it had a more dramatic inflationary effect on prices than mint output. For the East Anglian rents and Clark's average of all rents, the d. weights of gold and

ment, mint outputs or poor harvests were the primary drivers. These same expectations apply to the regression of rent data.

silver were the most statistically significant and had the highest r^2 calculations of all the independent variables. Yet the coefficients are positive, which is nonsensical because it suggests that as the intrinsic weight of the currency increased, so did rents! Population provides the other statistically significant independent variable for the East Anglian rental data and Clark's average of all rents. Though its r^2 is lower than that of the gold and silver d. weights, the positive coefficient is more appropriate, for they show that as population increased, rents increased too. Indeed, in the East Anglian Breckland, a 1% increase in population caused a 0.72% increase in arable land rents. In Clark's average of rents, which includes dwellings, a 1% increase in population caused a 1.137% increase in rents. It is logical that population would bring about a more dramatic swing in rental values in cases where dwellings were involved. Once people reached adulthood, there was a greater likelihood that they would wish to have their own home to start their own family, but adding to one's land holdings was presumably more of a luxury, and therefore demand elasticity for land was probably greater than it was for housing. Notably, neither the East Anglian rents nor Clark's average of all rentals show any dramatic impact of fluctuations in mint output or commodity prices, as evidenced by having low r^2 calculations. All these conclusions are repeated in the regression results of Clark's meadow rents and his arable rents, though none of the results is statistically significant. It is evident that, as was the case for commodity prices in Chapter 3, long-term rent trends in England appear more closely linked with changing population levels than with mint output or debasement.

	<i>Flemish Basket of Consumables</i>	<i>Flemish Coastal Land</i>	<i>Flemish Sandy Land</i>		<i>English Basket of Consumables</i>	<i>East Anglia Average</i>	<i>Clark (All)</i>	<i>Clark (Meadow)</i>	<i>Clark (Arable)</i>
<i>d. Weight (silver)</i>	-0.339 (0.354)	0.13 (0.231)	1.115* (0.545)	<i>d. Weight (silver)</i>	-2.07 (1.664)	3.18 (2.057)	-6.888 (6.284)	1.655 (2.269)	1.678 (2.717)
<i>d. Weight (gold)</i>	-0.035 (0.258)	-0.26 (0.148)	-1.1** (0.396)	<i>d. Weight (gold)</i>	1.702 (1.333)	-1.974 (1.761)	6.936 (5.482)	-1.205 (2.219)	-1.222 (2.24)
<i>Mint Output</i>	0.012 (0.043)	0.013 (0.026)	0.06 (0.094)	<i>Mint Output</i>	0.029* (0.014)	0.044 (0.042)	0.054 (0.122)	-0.023 (0.032)	-0.024 (0.033)
<i>Population</i>	-0.482 (0.661)	0.155 (0.328)	-0.125 (1.266)	<i>Population</i>	0.526 (0.328)	-0.428 (0.459)	0.779 (1.1)	0.135 (0.773)	0.137 (0.776)
<i>Flemish Basket of Consumables</i>	N/A	0.269 (0.207)	0.426 (0.397)	<i>English Basket of Consumables</i>	N/A	-0.371 (0.524)	0.086 (1.801)	0.034 (0.676)	0.044 (0.69)
<i>N</i>	14	14	11	<i>N</i>	15	14	15	15	15
<i>R</i> ²	0.439	0.4756	0.4716	<i>R</i> ²	0.5682	0.5715	0.5468	0.3423	0.3456

FIGURE 4.II.1

Combined Log-Log Regression Analysis of English and Flemish Rents (Decennial Averages)

[As Figures 2.5, 2.9, 2.12, 2.16, 2.18, 2.12, 3.28, 4.1, 4.5 and 4.7]

	<i>English Basket of Consumables</i>					<i>East Anglia Average</i>					<i>Clark (All)</i>				
<i>d. Weight (silver)</i>	0.086 (0.109)					0.69*** (0.114)					1.443** (0.479)				
<i>d. Weight (gold)</i>	0.067 (0.088)					0.583*** (0.091)					1.264** (0.426)				
<i>Mint Output</i>	0.041** (0.014)					0.017 (0.033)					0.049 (0.056)				
<i>Population</i>	0.326* (0.178)					0.72** (0.292)					1.137* (0.579)				
<i>English Basket of Consumables</i>	N/A					0.254 (0.569)					1.513 (1.27)				
<i>N</i>	15	15	15	15	N/A	14	14	14	14	14	15	15	15	15	15
<i>R²</i>	0.0445	0.0372	0.4273	0.2462	N/A	0.5047	0.48	0.0156	0.2516	0.0135	0.4521	0.4744	0.0216	0.1067	0.0818
	<i>Clark (Meadow)</i>					<i>Clark (Arable)</i>									
<i>d. Weight (silver)</i>	0.309 (0.178)					0.314 (0.182)									
<i>d. Weight (gold)</i>	0.247 (0.151)					0.252 (0.154)									
<i>Mint Output</i>	-0.013 (0.018)					-0.014 (0.019)									
<i>Population</i>	0.449 (0.287)					0.455 (0.289)									
<i>English Basket of Consumables</i>	0.084 (0.447)					0.085 (0.455)									
<i>N</i>	15	15	15	15	15	15	15	15	15	15					
<i>R²</i>	0.2340	0.2055	0.0169	0.1881	0.0028	0.2355	0.2070	0.0183	0.1878	0.0028					

FIGURE 4.II.2
Individual Log-Log Regression Analysis of English Rents (Decennial Averages)
[As Figures 2.5, 2.9, 2.12, 2.18, 3.28, 4.1 and 4.5]

	<i>Flemish Basket of Consumables</i>					<i>Flemish Coastal Land</i>					<i>Flemish Sandy Land</i>				
<i>d. Weight (silver)</i>	-0.361** (0.153)					-0.229** (0.082)					-0.18 (0.186)				
<i>d. Weight (gold)</i>	-0.372*** (0.117)					-0.255*** (0.062)					-0.237 (0.204)				
<i>Mint Output</i>	-0.029 (0.052)					-0.03 (0.037)					0.025 (0.054)				
<i>Population</i>	-0.393 (0.59)					0.485 (0.381)					0.454 (0.612)				
<i>Flemish Basket of Consumables</i>	N/A					0.509*** (0.108)					0.293 (0.297)				
<i>N</i>	14	15	15	14	N/A	17	18	18	17	15	14	14	14	14	11
<i>R²</i>	0.39	0.4884	0.018	0.0244	N/A	0.4085	0.5732	0.0379	0.0850	0.4906	0.0971	0.1981	0.0131	0.0318	0.0591

FIGURE 4.II.3
Individual Log-Log Regression Analysis of Flemish Rents (Decennial Averages)
[As Figures 2.5, 2.9, 2.16, 2.21, 3.28 and 4.7]

Figure 4.11.3 shows that, as was the case for England, individually regressing independent variables gives greater significance levels for the Flemish data. The basket of consumables shows that the most significant drivers of the general price level were the weights of the gold and silver currency, with the r^2 indicating that gold and silver explained 48.84% and 39% of price movements respectively. Both show a negative coefficient, indicating that, as we would expect if debasement were driving prices, as the coins got lighter, prices increased. The r^2 and coefficient are slightly stronger for gold, which could suggest that gold was more inflationary than silver. Chapter 3 demonstrated that the opposite was almost invariably the case for commodity prices. It is possible that the use of decennial rent averages in the regression analysis has made rent levels appear more stable than they were, and thus the rent trends correlate more closely to the stable nature of the gold currencies. The decennial averages of rent trends from the Flemish coastal area show much the same patterns as did the baskets of consumables—the debasement of gold and silver currencies are again the most significant independent variables, with gold being the slightly stronger of the two. This is unsurprising because the strong significance level, the r^2 and positive coefficient between the coastal rents and the baskets of consumables indicate a high degree of correlation between the two variables. The impact of mint output, in contrast, appears minimal on account of its low r^2 and almost neutral coefficient. Population explains only 8.5% of the Flemish coastal rent trends, though the coefficient indicates that within that 8.5%, a 1% increase in population would cause a 0.485% increase in rent levels. The rentals from the sandy lands show fairly similar conclusions, though none of the r^2 calculations is as high, and the coefficients are not statistically significant.

Gold has the highest r^2 , with its debasement explaining 19.81% of the rent trends. Silver, on the other hand, explains just 9.71% of rent trends. Mint output is again able to explain only just over 1% of rent trends, and has an almost neutral coefficient. Population, while explaining merely 3.18% of the sandy land rent trends has the strongest coefficient of the lot, and within that 3.18%, a 1% change in population could have caused rents to inflate by 0.454%.

Though the role of debasement is the clearest driver of Flemish rents, as was seen to be the case for commodity prices in Chapter 3, rents are slightly more nuanced than commodities. In contrast with commodity price findings in Chapter 3, and the largely repeated conclusions regarding the decennial basket of consumables regressions, population seems to have had a minor role in driving rents. It is certainly reasonable that population should at least play *some* part in rent trends because, as stated at the beginning of this chapter, the supply of land was more inelastic than that of commodities.

The log-log regression of rent levels has offered a number of interim conclusions. It has shown that population was the key driver of English rents, while debasement was the most significant for Flemish rents. These conclusions can be further established by running simple correlation tests. Figure 4.11.4 sets out the results in a correlation matrix.⁵⁸⁸ For population and commodity prices to have been a potential driving force behind rent trends, we would expect to see a reasonable positive correlation. Counter-intuitively, for the fluctuating weight of a penny denomination to have played a key role in rent trends

⁵⁸⁸ The correlations have been constructed by using the absolute data, rather than indices. This makes no difference to the result because correlation is a simple measure of the relationship between two trends and the result does not incorporate absolute values.

a negative correlation would be required—as the weight of the penny decreased, there should have been an increase in rents through inflation.

	<i>d. Weight (silver)</i>	<i>d. Weight (gold)</i>	<i>Mint Output</i>	<i>Population</i>	<i>Basket of Consumables</i>
<i>East Anglia</i>	0.74	0.72	0.12	0.48	0.10
<i>Clark (All)</i>	0.65	0.66	0.27	0.37	0.27
<i>Clark (Meadow)</i>	0.49	0.46	-0.19	0.43	0.03
<i>Clark (Arable)</i>	0.49	0.46	-0.19	0.43	0.03
<i>Flemish (Coastal)</i>	-0.60	-0.75	-0.22	0.3	0.71
<i>Flemish (Sandy)</i>	-0.23	-0.36	0.21	0.21	0.26

FIGURE 4.11.4
Correlation Matrix of Rents in England and Flanders
[As Figures 4.11.2 and 4.11.3]

For Flanders, it seems fairly conclusive that the strongest link is between coastal rents and the weight of the gold currency. This is followed by the link between rents and the weight of the silver penny *groot*. The sandy lands of Flanders correlated less strongly to the weights of the gold and silver currency, probably because lower demand for inferior land, which had caused less rent inflation, also reduced the impact of economic triggers. Mint output possibly played a minor role in the trends of sandy land rents, though the negative correlation seen in the coastal rent data suggests that this might be spurious. Population did also have a minor positive correlation with Flemish rents, again suggesting that demographic drivers were not entirely insignificant. In contrast, English rents show that the slowly declining weight of the penny did not cause any inflation—in fact, as the penny slowly deteriorated over time, so did rents. This is consistent with the positive coefficients seen in Figure 4.11.2 above. Likewise, it seems evident that rents were hardly linked to the value of the basket of consumables at all. The mint output has a minor link to rents in East Anglia and for Clark’s averages of all rents, but this could well

have been coincidental because the correlation is negative for Clark's meadowland averages and arable averages. Instead, the strongest determinant of English rent prices seems to be the population trends, where East Anglia had a correlation of 0.48. This is not overwhelmingly strong, but it is noteworthy. While correlation does not prove causation, it does seem reasonable to conclude, given the findings of Chapter 3, that the role of debasement was a stronger determinant of rents in Flanders, while population had a greater impact on English rents. The following sections examine the impact of these three economic drivers in more detail, and provide support for conclusions by incorporating anecdotal rent data from Scotland.

4.1.3 THE IMPACT OF DEBASEMENT

Figures 4.11.1, 4.11.2, 4.11.3 and 4.11.4 showed that the rate of debasement was entirely insignificant for English rents, but of great importance in Flanders (especially for coastal rents). In Flanders, debasement seems to have contributed to the inflation of both commodities and rent prices. In England the trend of mild debasement did not stop the downward march of rent prices, and it was this monetary stability which has apparently allowed population levels to act as a significant driver of long-term price and rent trends. Though it is not possible to construct a rent series for Scotland, the above analysis can be supplemented with anecdotes from the Coupar Angus series. There are enough cases of recurring comparable rentals to offer a number of conclusions about the general trends of rent prices in Coupar Angus from the mid fifteenth century to the early sixteenth. The most important observation is that, as in many examples of Scottish commodity prices, and the trends seen in Flemish coastal rents, the cost of rent did generally increase over

the period, which fits with the conclusion that Scottish debasement had an impact on prices.⁵⁸⁹ This conclusion is reinforced by the realisation that many increases in rent price occurred in the 1460s and 1470s, the periods when the Scottish were debasing heavily. The land of Parcy is an example of this. In 1463, a quarter was rented out to Patrick Angussoun for 5 years at a cost of £2, 10s. and 5 kids (£10 and 20 kids [i.e. young goats] for the entirety). In 1473 the entire land of Parcy was rented out to Alan Roeoch and John Malyoch for their lifetime, for £17.3, plus 20 kids. Though there was no change in the amount of payment in kind due for the entire land of Parcy, the cash rent increased by 73%. However, another entry in 1463 described a 5-year tenure of 2/4 of Parcy being worth £7, 10s. plus 15 kids (thus £15 and 30 kids for the entirety).⁵⁹⁰ Compared with this lease, the 1473 price is only 15.3% higher, and the payment in kind is 30% lower. However, not all rents increased over the period, and the general trend was that tenants who were well behaved had their rents frozen and were granted life rents. Only when the land passed to a new tenant did the Abbey tend to put up the price.

Of course, as with commodity prices, the various monetary changes that happened to the Flemish *groot* throughout the fourteenth and fifteenth centuries make it difficult to compare nominal prices alone. Therefore, it is once again necessary to convert the data into prices expressed in silver grains.

Figure 4.12 shows that, in Flanders, when the nominal cost of rent is expressed in silver

⁵⁸⁹ In the Coupar Angus lands, many villages saw rent increases of between 20% and 100% in the fifteenth and early sixteenth centuries.

⁵⁹⁰ *Cupar-Angus*, i, pp. 136, 201.

grains, the period from the 1430s to the 1500s is now characterised by a clear and protracted decline in land value (or a rise in silver value). The high rent prices in Flanders during the 1430s persist, suggesting that a simple reaction to debasement was not to blame. In contrast, the inflation of Flemish rent prices on coastal land during the 1480s is now gone, implying that the increase in rent price was insufficient to offset the impact of debasement in this decade. This seems bizarre, but the average weight of the Flemish *groot* in the 1480s was the lowest of the entire period—in the 1470s it had stood at just over 9 grains per penny *groot*, but it fell to 6.97 grains in the 1480s, before rising back up to 8.12 grains in the 1490s. Between the 1470s and 1480s, therefore, the penny *groot* decreased by about 23%, which was still less than the c.65% food price inflation in the 1480s. It is likely that the reaction in rent prices was not perfectly mirroring food prices because leases would have to be up for renegotiation during a crisis period for the crisis to dictate a change in price. Thus, for Flemish rents to have nevertheless moved up by 23%, some must have risen much more and some much less, all depending on whether they were renegotiated in a key year.

In Chapter 3 it was postulated that there was a recession in Flanders from around the 1430s to the 1480s, which had occurred when the Flemish attempted to emulate English monetary policy by halting their tendency towards low-level, frequent debasements. There is further support for this theory in the rent data. Vervaeet has studied the arrears that tenants built up at the Hospital of St John's in Bruges.⁵⁹¹ Her data shows that there

⁵⁹¹ Vervaeet, 'Lease Holding', p. 121.

was a greater number of tenants in arrears during the period when the Flemish stopped debasing. This could indicate a lack of money in the countryside, which can be seen represented by stagnating rents during the period (see Maldegem-Eeklo, Diksmuide, and the lands north and south of Bruges in Figure 4.7).⁵⁹² There is further evidence that constant low-level debasement was necessary for the fluidity of the rural economy in Flanders—though there was a cycle of heavy debasement in the 1480s, which saw tenants of St John’s revert to paying the sum owed for their rent, the reinforcement of 1490 appears to have triggered another bout of heavy non-payment, with tenants defaulting on their rents entirely during the 1490s and 1500s.⁵⁹³ Vervaeet suggests that these tenants were not evicted because the Hospital probably struggled to find solvent farmers during this period.⁵⁹⁴ Evidently, then, in Flanders debasement could cause rent price inflation if it was too aggressive, but a lack of debasement could also cause tenants to default on their rents if

⁵⁹² There is also evidence of English tenants running up arrears in the period after the Black Death. However, it seems more likely that it was the result of tenants trying to get a reduction in their rent costs, rather than because there was no money about. For example, Richard II’s parliament heard in January 1390 that tenants at Lincoln had accumulated over £100 of arrears, caused by a desire of some tenants ‘to hold their lands free of rent rightfully owed to the said Church’. See *PROME*, iii, p. 259. Though Chapter 3 suggested that in the 1390s there was a lack of small change, it is unlikely that this non-payment of rents was caused by a lack of small change because rents fall into the high-cost category where larger denominations were used. For more on the size of rent arrears in the fifteenth century, see V. Spear, *Leadership in Medieval English Nunneries* (Woodbridge, 2005), p. 113; M. Heale, *The Dependent Priors of Medieval English Monasteries* (Woodbridge, 2004), pp. 249–52. There was also suggestion that the Pastons acknowledged that their tenants had solvency issues in the 1460s, which was in part caused by the difficulty in selling goods. See Hatcher, ‘Great Slump’, pp. 259–60. Arrears seem to have been less common in East Anglia, as Bailey points out that Chevington did not see significant or sustained arrears in the fifteenth century. See Bailey, *Decline of Serfdom*, p. 185. The Duchy of Cornwall also evaded the rise in arrears after the 1380s, see R. H. Hilton, *Bond Men Made Free: Medieval Peasant Movements and the English Rising of 1381* (London, 1977), p. 153.

⁵⁹³ Friedman and Figg suggest that the reinforcement of 1490 might have been the result of mercantile pressure following the debasements of the 1480s. See J. B. Friedman and K. M. Figg, *Travel, Trade, and Exploration in the Middle Ages: An Encyclopedia* (London, 2013), p. 169.

⁵⁹⁴ Vervaeet, ‘Lease Holding’, p. 121.

not enough money circulated in the countryside.

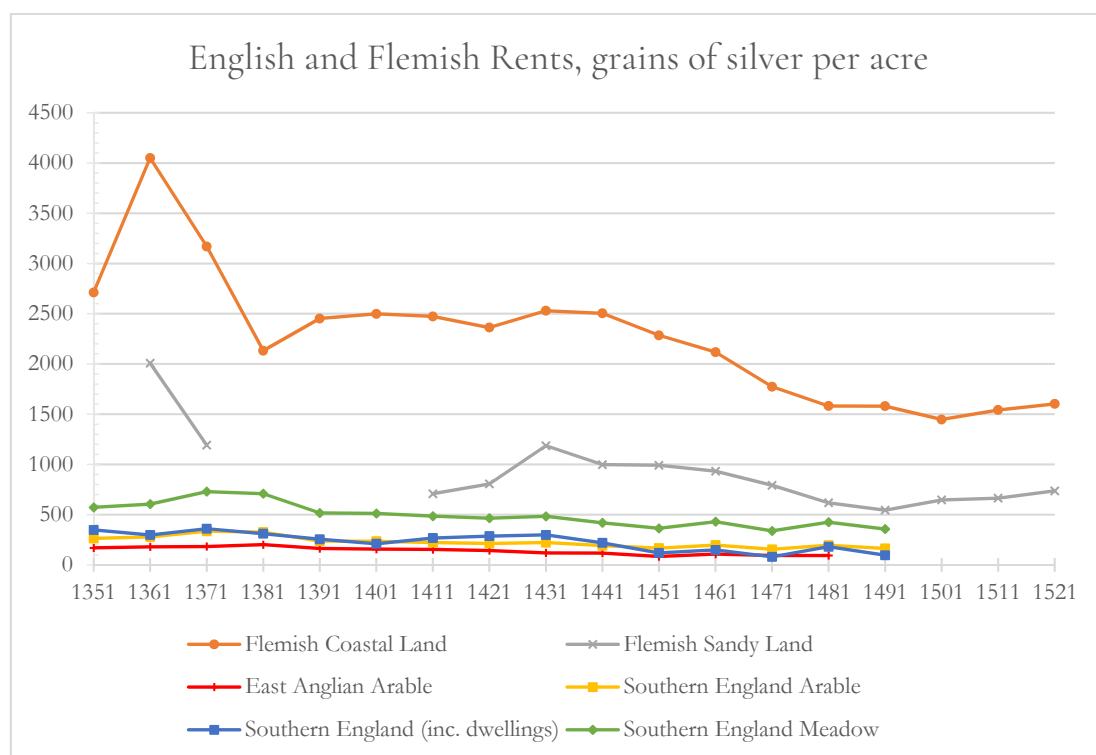


FIGURE 4.12
[As Figures 2.5, 4.1, 4.5 and 4.7]

It is clear that, for Flanders and Scotland at least, there is a distinct and probable link between the debasement of the currency and the inflation of rent prices.⁵⁹⁵ Though the reaction to debasement was not a perfect mirror of debasement, this was also true of commodity trends—as Spufford stated: ‘in periods of debasement, there was quite frequently a deliberate official policy of secrecy to prevent the public from knowing the extent of debasement’. He goes on to remind the reader that it is unwise to assume that price rises would occur at the precise rate of debasement for this very reason.⁵⁹⁶ However,

⁵⁹⁵ And indeed between a lack of debasement (or currency reinforcement) and escalating rent arrears.

⁵⁹⁶ Spufford, ‘Debasement of the Coinage’, p. 63.

even in Scotland and Flanders there were exceptions to the rule: not all Scottish rents inflated in line with debasement, and the sandy lands in Flanders did not incur the same levels of inflation as the coastal lands. Indeed, in Scotland some of the Coupar Angus rents show ‘stickiness’—rents that remained constant over a protracted period of time. In 1471, all of Cragnevady was let to William Coly for 5 years, and was charged at 12 marks per year, with 12 marks *grassum*.⁵⁹⁷ In 1473, he was let the land again, but for life and at a charge of £10 (15 marks) per year. He presumably died because, in 1478, half the land was let to four men (Donald Ramsay, William Burne, Michael Fynlouson and Robert Boysauch), for a combined cost of £5 with a £4 *grassum*.⁵⁹⁸ In 1512, the implied total value of £10 for Cragnevady remained unchanged when a quarter of the land was let to John of Haw for 5 years at a cost of £2 10s.⁵⁹⁹ Evidently more than just money was influencing rent trends; this chapter now sets out reasons for variation.

4.1.4 LOCATION AND THE VALUE OF OUTPUT

Population fell everywhere, but its impact varied according to the quality of the land. As was suggested by the higher cost of coastal land in Flanders, and the premium commanded by meadowland in England, in-demand products had a higher value than those less in demand. This variation in demand meant that, in Flanders, the impact of debasement was reduced for less popular land, such as the sandy lands. It was also demonstrated that, though population had a far lesser impact on rural rents in Flanders, the effect was

⁵⁹⁷ *Grassum* is the additional lump sum (i.e. entry fine) paid by the tenant to the landlord at the start of an agreement.

⁵⁹⁸ Thus giving an equivalent cost of £10 for all of Cragnevady.

⁵⁹⁹ *Cupar-Angus*, i, pp. 158, 166, 227, 286.

lower still for the sandy lands. However, it has been noted that in the middle of the fourteenth century, about 40% of the Flemish population lived in urban centres,⁶⁰⁰ compared with just 13.7% of the English population in the late fourteenth century.⁶⁰¹ Urban living was therefore a lifestyle enjoyed by almost half of the people in late medieval Flanders. Given that the commodity price data in Chapter 3 also came from urban centres, in order to gauge the impact of debasement, mint output and population on living standards, it is necessary to examine whether the rent trends in Flanders are different when city data is considered. As demonstrated in Chapter 2, Nicholas has provided a number of estimates for the Ghent population in the second half of the fourteenth century, which I have interpolated to give annual estimates. Using this data, it is possible to compare the rentals of houses in Ghent with the fluctuating city population. Likewise, it is possible to compare Ghent rents with the patterns of debasement in the late fourteenth century. Data for sale prices of houses also exists, so this has been included for the sake of breadth [Figure 4.13].

Both the rental and purchase costs of houses in Ghent appear to have followed a fairly similar pattern, peaking around the 1370s and early 1380s, and declining into the late 1380s and early 1390s. However, as the r^2 shows, the purchase prices were far more volatile than rent prices. This is explained by considering that rentals were—as stated above—renegotiated every few years, while sales were one-off price arrangements. Thus, there was greater potential for fluctuation in the sale prices. The volatility of sale prices can

⁶⁰⁰ P. Stabel, *Dwarfs Among Giants: The Flemish Urban Network in the Late Middle Ages* (Leuven, 1997), p. 327.

⁶⁰¹ And by the sixteenth century the urban population was still around 20%. S. Rigby, 'Urban Population in Late Medieval England: The Evidence of the Lay Subsidies', *EconHR*, Vol. 63, No. 2 (2010), p. 405.

clearly be seen when the years 1370 and 1382 saw unusually low prices, dropping to 162.1 d. Fl. gr. and 767.15 d. Fl. gr. respectively. The extent to which these fluctuations can be explained by changes in the city's population and by the debasement of the Flemish *groot* are expressed in the regression analysis, Figure 4.14.

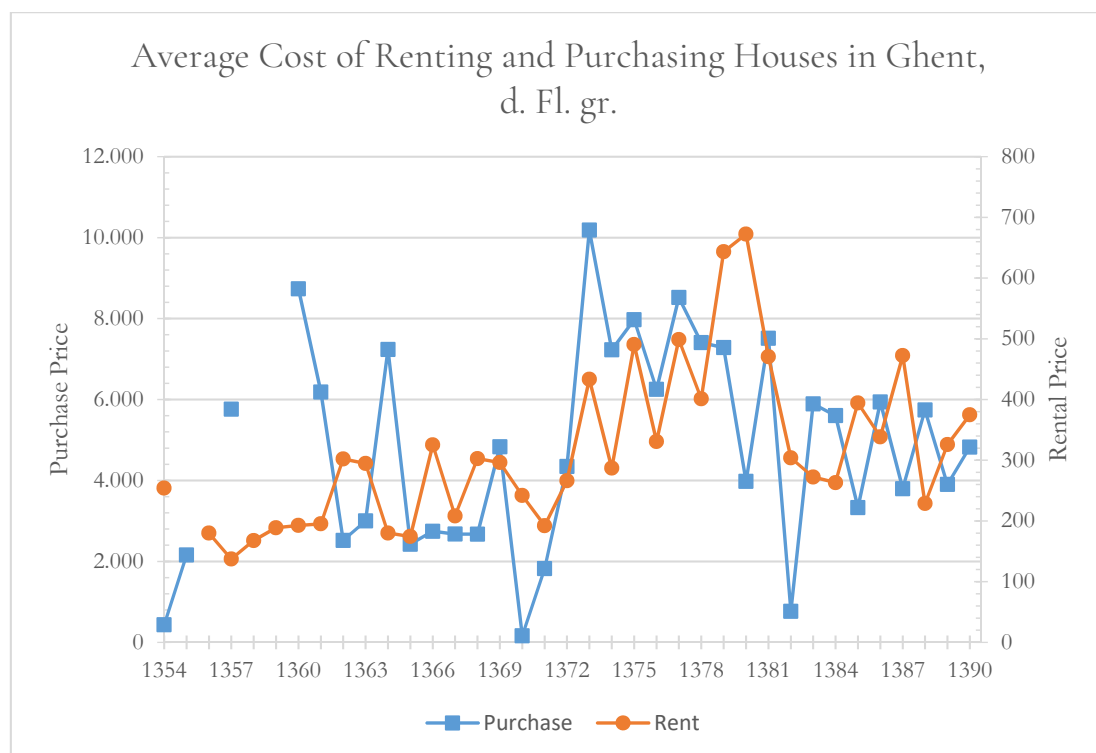


FIGURE 4.13
[Figure 2.20, Nicholas, *Metamorphosis*, p. 105.]

Though none of the relationships is statistically significant for sale prices in Ghent, a number of important conclusions can still be drawn. It is evident that population in Ghent declined in periods where the cost of renting and buying houses increased—thus, a declining city population in the late fourteenth century did not have the same impact on rent prices as the declining population in England had. This is expressed by the negative coefficient yielded when population acts as an explanatory variable for both house

rent and sale prices in Ghent. Again, it seems for Ghent's rental prices, debasement was the most important factor—both silver and gold coin weights give negative coefficients when used as explanatory variables, and the r^2 values are the highest of all. Notably, in contrast with commodity prices, gold appears to have had a greater inflationary effect on rent prices—the r^2 is higher than the silver penny's, indicating a stronger explanatory role, and the coefficient is also greater than that of the silver penny. Though the least statistically significant of all the independent variables, mint output was also important, indicating that the quantity of money in circulation had an impact on rent prices. Indeed, the r^2 is higher than it was in most cases for Flemish commodity prices. Notably, however, though debasement still had a closer link to the rent and sale prices of houses than population, its influence was much weakened compared to the strong regressions seen in the rents of coastal land.

	<i>Ghent Rent</i>				<i>Ghent Sale</i>			
<i>d. Weight (silver)</i>	-1.04*** (0.262)				-0.794 (0.605)			
<i>d. Weight (gold)</i>	-1.264*** (0.279)				-0.625 (0.597)			
<i>Mint Output</i>	-0.115* (0.064)				0.088 (0.209)			
<i>Population</i>	-1.036*** (0.2)				-0.1 (0.413)			
<i>N</i>	36	29	30	34	34	27	28	32
<i>R</i> ²	0.3773	0.4976	0.1236	0.3655	0.0409	0.0224	0.0123	0.0007

FIGURE 4.14

Individual Log-Log Regression Analysis of Rental and Sale Prices in Ghent
[As Figure 4.13]

Coefficients with asterisks to indicate significance levels: * is significant to 10%, ** is significant to the 5% level, and *** indicates significance at the 1% level. Robust standard error is shown in brackets beneath the coefficients.

The differential between coastal and sandy land rental values in Flanders demonstrated that the quality of the land, and the potential to profit from it, were important qualitative drivers of rental value.⁶⁰² Similar factors were also important in urban centres because the type of property in question had a major impact on its value.

	<i>Total Observations</i>	<i>Mean Rent (d. Fl. Gr.)</i>	<i>Median Rent (d. Fl. Gr.)</i>	<i>Total Sales</i>	<i>Mean Price (d. Fl. Gr.)</i>	<i>Median Price (d. Fl. Gr.)</i>
<i>Bakery</i>	15	560.80	480	7	4,234.29	3,360
<i>Brewery</i>	16	611.75	564	15	7,987.73	9,000
<i>Bathhouse</i>	15	878.93	545	5	7,392.00	5,760
<i>Dyery</i>	11	416.73	480	2	10,800.00	
<i>Fullery</i>	2	300.00		1	1,440.00	
<i>Mill</i>	6	864.00	840	3	5,880.00	5,280

FIGURE 4.15
Average Rents for Various Buildings in Ghent
[Nicholas, *Metamorphosis*, p. 106.]

As Figure 4.15 shows, the least valuable property in Ghent in the late fourteenth century was the fullery, followed by the dyery. It is no coincidence that both of these properties suffered from low valuation, since the late fourteenth century was when the Flemish cloth industry started to decline, and Ghent was a major commercial centre. Indeed, the link between profitability and rent price can also be seen in the Coupar Angus data.

⁶⁰² Casson and Casson suggest that the type of property and its location were key factors in its value. C. Casson and M. Casson, 'Location, Location, Location? Analysing Property Rents in Medieval Gloucester', *EconHR*, Vol. 69, No. 2 (2016), p. 593. They raise the point that the size of the land could interact with the value of the property, see p. 588. The implicit conclusion from having rent data in units per acre is that rents in England and Flanders were additive, insofar as double the land cost double the money. This was also the case for Scotland. For example, in 1464, 1/4 of Tullyfergus's land cost 34s. 4d. for a 5-year agreement, allowing us to believe that the total value of Tullyfergus' land was 137s., or £6.85. In the same year, 1/2 of Tullyfergus was rented out for 5 years at a cost of 5 marks, giving an implied value of 10 marks (or £6.66) for all of Tullyfergus. This is a variation of just 2.85%, or 3s. 9.6d. See *Cupar-Angus*, i, p. 140.

Though Robert Perry found that his rent price increased from 7 marks for a 7-year contract in 1464, to 9 marks for a 5-year agreement in 1472, when Thomas Portar took over the mill in 1476, his 5-year lease only cost him 6 marks. In 1478, Thomas Portar was given the mill for life, still for 6 marks per year.⁶⁰³ Of course, there was a good deal of rent stickiness in Scotland—in the middle of the fifteenth century the *Exchequer Rolls* note that the rent for Molenab's mill was always £8 per year.⁶⁰⁴ It could be argued that the decline in the cost of Thomas Portar's mill was the result of him securing a life-long rental agreement, but the added security of continuous tenancy for the Abbey did not always correlate with lower rents, as the example of Parcy has already shown.⁶⁰⁵ Instead, it seems no coincidence that the fifteenth century saw a decline in wool exports from Scotland, when they seldom exceeded 2,000 sacks per year,⁶⁰⁶ and this probably partly contributed to the decline in Portar's rental cost. Indeed, the influx of cheap Baltic wool to the Low Countries in the second half of the fifteenth century had destroyed a good deal of the Scottish wool and cloth trade.⁶⁰⁷

Commercial fortunes also impacted on rents in England and there is no clearer ex-

⁶⁰³ *Cupar-Angus*, i, pp. 133, 161, 225, 214.

⁶⁰⁴ *ER*, iii, p. 171; *ER*, v, pp. 202, 247.

⁶⁰⁵ It is also noteworthy that the Abbey of Coupar Angus saw a general trend towards lifelong rents as the fifteenth century drew to a close. Margaret Sanderson's graphs show that 5-year leases were the most popular in the fifteenth century, followed by lifelong contracts. In the period following the resumption of the rental book, from 1539 onwards, lifelong leases overtook 5-year agreements to become the most common length of tenure. See her contribution in P. G. B. McNeill, H. L. MacQueen and A. M. Lyons (eds), *Atlas of Scottish History to 1707* (Edinburgh, 1996), p. 292.

⁶⁰⁶ Grant, *Independence and Nationhood*, pp. 236–7.

⁶⁰⁷ Gemmill and Mayhew, *Changing Values*, p. 287.

ample of this than for East Anglia. Part of the reason why the English basket of consumables had borne no significant correlation to the English rents was due to a higher volatility of commodities than rents. Figure 4.16 shows that the r^2 of the basket of consumables was far lower than that of most rentals. This is unsurprising, given rental values fluctuated only when contracts were renegotiated (or when a new tenant took up the land), but commodity prices fluctuated seasonally.

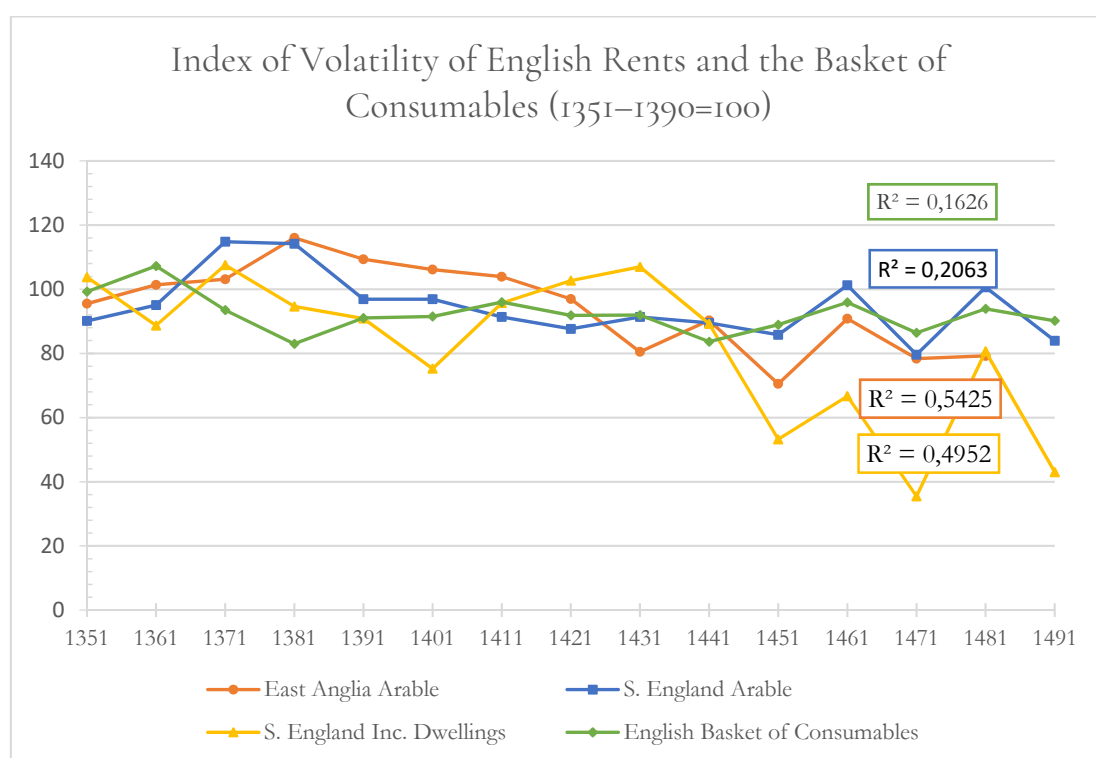


FIGURE 4.16
[As Figures 3.28, 4.1 and 4.5]

However, when it is remembered that East Anglia was a main producer of medium-quality cloth, it makes more sense to search for a link between the price of woollen cloth and land values. Figure 4.17 does just this. Woollen cloth and rents in East Anglia shared a strong positive correlation—when the value of cloth went up, so did rents. The strength

between cloth prices and rents is even stronger than population and East Anglian rents: woollen cloth correlated to 0.52, whereas population was lower at 0.48. Calculating the r^2 using rents as the y variable and population/woollen cloth as the x variables, 27.04% of the East Anglian rent trends can be explained by movements in wool prices. Population fluctuations explain 23.04%. Though there is overlap between the influence of population on wool prices and rent prices alike, East Anglian rents were still more influenced by woollen cloth prices than Clark's averages for southern England, where c.23% of the rent fluctuations were explained by woollen cloth prices. Of course, for non-cloth areas, this figure would have been much lower, and Clark's figures correlate at a higher level because they include East Anglian data and rents from the Cotswolds.

The impact of wool on the value of land in East Anglia is most clearly seen in the periods where the value of wool was most in decline. Woollen cloth prices slumped from the 1370s to about 1500, when the Flemish cloth industry was failing. Though England did not export so much wool during this period, the cheapening of the raw material caused by a lack of demand from the Low Countries reduced the overall cost of the finished product. Rents in East Anglia also slumped, albeit from the 1380s to the 1430s. Not all of this can be accredited to the declining cloth industry because wool prices recovered faster than rents, and here we must assume that the continuing fall in population also encouraged the downward march of rents. East Anglian rents also sharply declined in value in the 1430s, which was another decade of poor harvests. Given that poor harvests generally increased commodity prices, and should therefore have had a positive impact on land

value, there must have been an overriding factor to trigger such a fall in rents. It is possible that the chaos was caused by the partition ordinance, which forced the Flemish to pay cash for their English wool and cloth. The result was a fall in wool prices in the 1430s and a temporary preference for Scottish and Spanish wool as English exports collapsed.⁶⁰⁸ This theory is supported by the rise in East Anglian rents in the 1440s, which fits with the repeal of the ordinance in 1444,⁶⁰⁹ and the gradual restoration of confidence in the English cloth industry. The most distinct impact of the cloth industry on East Anglian rents, however, was during the 1450s. The price of woollen cloth fell as reduced demand from Flanders, which was suffering from something of a recession in this period, lowered the English balance of payments surplus. The knock-on effect was apparently a panic, where the lands most involved in the wool trade dropped in value. The evidence for the 1450s rent drop being caused by wool can be seen by comparing Figures 4.17 and 4.1. Though Clark's southern England averages show a slight decline, it was less pronounced than in East Anglia.

4.1.5 RENTS: CONCLUDING REMARKS

This comparison of rents in England, Flanders and Scotland has shown that population trends and profitability from land were the key drivers of English rent prices. In Flanders and, to a lesser extent, Scotland, it became clear that the same debasement that had caused the inflation of commodity prices also affected rents, in particular those of the superior coastal lands. This was not to say that other factors played no part in Flemish

⁶⁰⁸ Spufford, *Monetary Problems and Policies*, p. 100; Kermode, *Medieval Merchants*, p. 165.

⁶⁰⁹ Kermode, *Medieval Merchants*, p. 167.

rents, and the Ghent data demonstrated that while population showed no link to rent prices, the decline of the Flemish cloth industry appears to have harmed the Ghent property market. This was also the case in Scotland, where the value of a fulling mill declined as Scottish wool lost popularity on the Continent, in favour of cheaper Baltic wool. In England, macroeconomic events, such as the collapse of the Flemish cloth industry,⁶¹⁰ the introduction of harmful Staple legislation, and the knock-on from a drop in Flemish demand for cloth also damaged rents. It is clearer now more than ever that the late medieval economy of England was unique: in sharp contrast to Scotland and Flanders, the long-term trends surveyed so far were not predominantly driven by debasement.

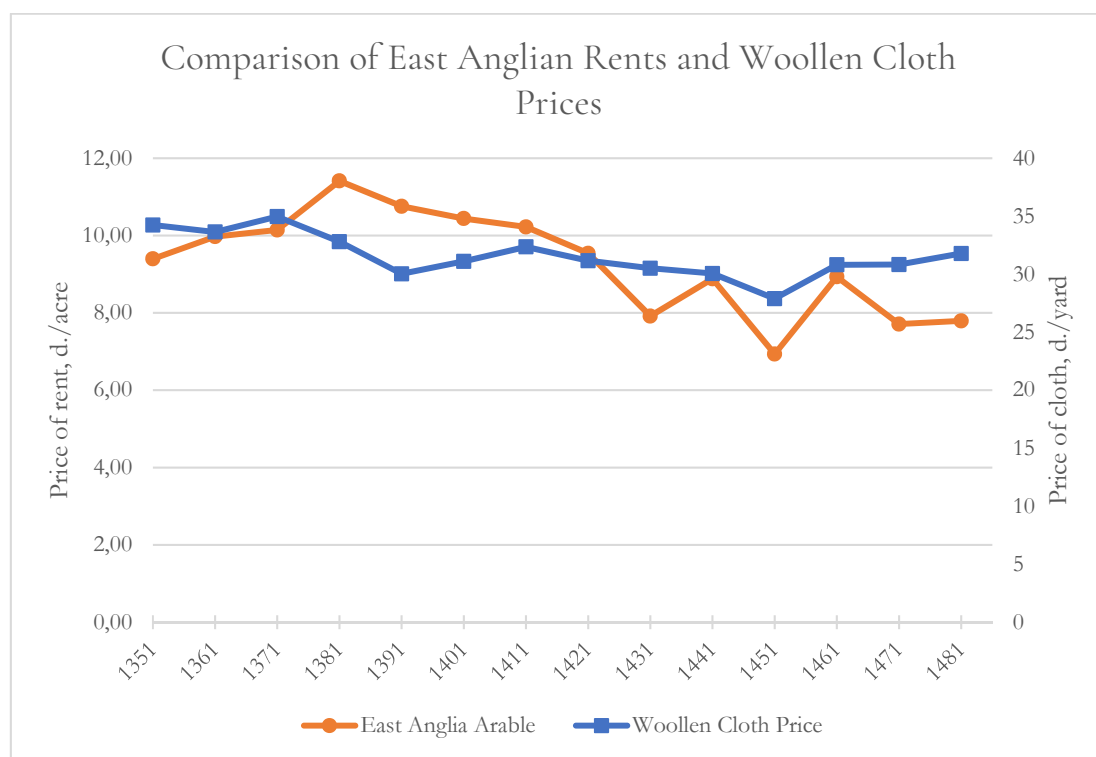


FIGURE 4.17
[As Figure 4.5; Clark, 'Price History', pp. 35–105.]

⁶¹⁰ Though, as shown above, this was somewhat offset by the rise of the English cloth industry.

There is certainly reason to argue that location and the potential to gain profit from the land had a direct impact on rent prices. For England, this was even more significant a determinant of rent trends than population, though only just. There is also evidence of rents in Ghent declining when the cloth industry fell into decline, and a similar example was seen in Scotland.

4.2 WAGES

This thesis has so far demonstrated that England's economic experience during the period after the Black Death was unusual when compared to the situations in Scotland, Flanders and Brabant. Perhaps enabled by England's hard-money policy, population appears to have been a more important driver of English trends than debasement and mint output, whereas debasement—and, to a lesser extent, mint output—had a clearer impact on rents and prices in Scotland, Flanders and Brabant. Of course, I have already suggested that perhaps population was able to influence prices and rents so clearly only because the English seldom debased their currency.⁶¹¹ Wages are now examined to explore whether England's experience was unusual in this sphere too, and whether there was still a clearer link to population levels than to the value of the English currency.

Like rents, medieval wages data are fraught with complexities. These derive from the nature of the data. A good deal of wage data is presented in the form of piece work, rather than the value of a day's work or a week's work. Piece work does not allow us to construct daily or weekly wages because it is impossible to know how much work was done each

⁶¹¹ See p. 240.

day. Thus, constructions of wage series are forced to exclude most piece work data and instead rely on the far less readily available day and week wages.

Furthermore, even when day wages are found, it is difficult to form comparisons because terms such as ‘mason’ were not necessarily indicative of the individual’s rank. For example, at Caernarvon Castle in October 1304, 53 masons were employed, but there were 17 different grades of pay. Likewise, in October 1316, there were 12 different rates of pay for 24 masons.⁶¹² Evidently the historian is left to speculate on the rank of the individual when there is scanty detail. This is made more speculative still when we consider that much of the agrarian sector was employed on a seasonal basis, and rates for some agrarian professions might well have been better during at harvest times.⁶¹³

There are also variations in the type of data available for each country. For England, we have both agrarian and industrial wages. For Flanders and Brabant, wages tend to be from urban commercial centres and focused on the building industry. As was the case for Scottish rents, it is not possible to construct a time series for Scottish wages because there is insufficient data. However, there is sufficient anecdotal evidence to allow Scotland to add further colour to the comparisons of wage trends.

As with rents, there are enough individual datasets for England and the Low Countries to warrant two sections discussing the absolute variations of day wages within each domestic labour market. Only then is it feasible to construct some averages and conduct comparisons. The analysis of wages then turns to the question of real wages and standards

⁶¹² D. Knoop and G. P. Jones, *The Mediaeval Mason: An Economic History of English Stone Building in the Later Middle Ages and Early Modern Times* (Manchester, 1967), p. 73.

⁶¹³ Farmer, ‘Prices and Wages’, pp. 467–90.

of living, looking at data constructed by established historians and offering some adjustments.

4.2.1 ENGLISH WAGES

Throughout this thesis it has become clear that there is an abundance of data for medieval England, and that this great availability of data has led to England's economy being a common subject of study, even though we have seen so far that its economy was far from normal. Wages are no exception to this rule. As such, the wage data has formed a core part of the historiography of the late medieval English economy. From the late nineteenth century, a number of historians have constructed sets of price and wage data, notably Thorold Rogers, Lord Beveridge and P. J. Bowden.⁶¹⁴ The work of D. L. Farmer offers the most comprehensive modern collection of wage data, drawn from manorial sources but incorporating the Rogers, Beveridge and Bowden data where appropriate.⁶¹⁵ Farmer's extensive dataset offers a number of wage series, spanning from agrarian wages to industrial wages. Like Clark, his data focuses on the south of England, but his 'national averages' for wages exclude London data on account of wages being far higher than elsewhere and thus skewing the averages.⁶¹⁶ Though Farmer's data is excellent, enhancements can be made by integrating the work of other historians. Dyer's use of the Thorold Rogers' data enables us to switch the combined wage of a thatcher and his mate into two individual

⁶¹⁴ See Thorold Rogers, *Agriculture and Prices*; W. H. Beveridge, *Prices and Wages in England from the Twelfth to the Nineteenth Century* (London, 1965); P. J. Bowden, 'Agricultural Prices, Farm Profits, and Rents', in J. Thirsk (ed.), *AHEW* (8 vols, Cambridge, 1967), iv, pp. 815–50.

⁶¹⁵ Farmer, 'Prices and Wages', pp. 495, 499.

⁶¹⁶ *Ibid.*, pp. 475, 495, 497.

wage series, allowing a more in-depth comparison of the difference between skilled and unskilled labour.⁶¹⁷ Though Farmer's data only runs until 1500, Munro, using data from Phelps Brown and Hopkins' pivotal work, managed to extend the wage series of building labourers and building craftsmen beyond Farmer's 1500 endpoint, with the data now spanning beyond the 1530s.⁶¹⁸ Combined, all this wage data gives a fairly respectable insight into medieval wage trends after the Black Death.

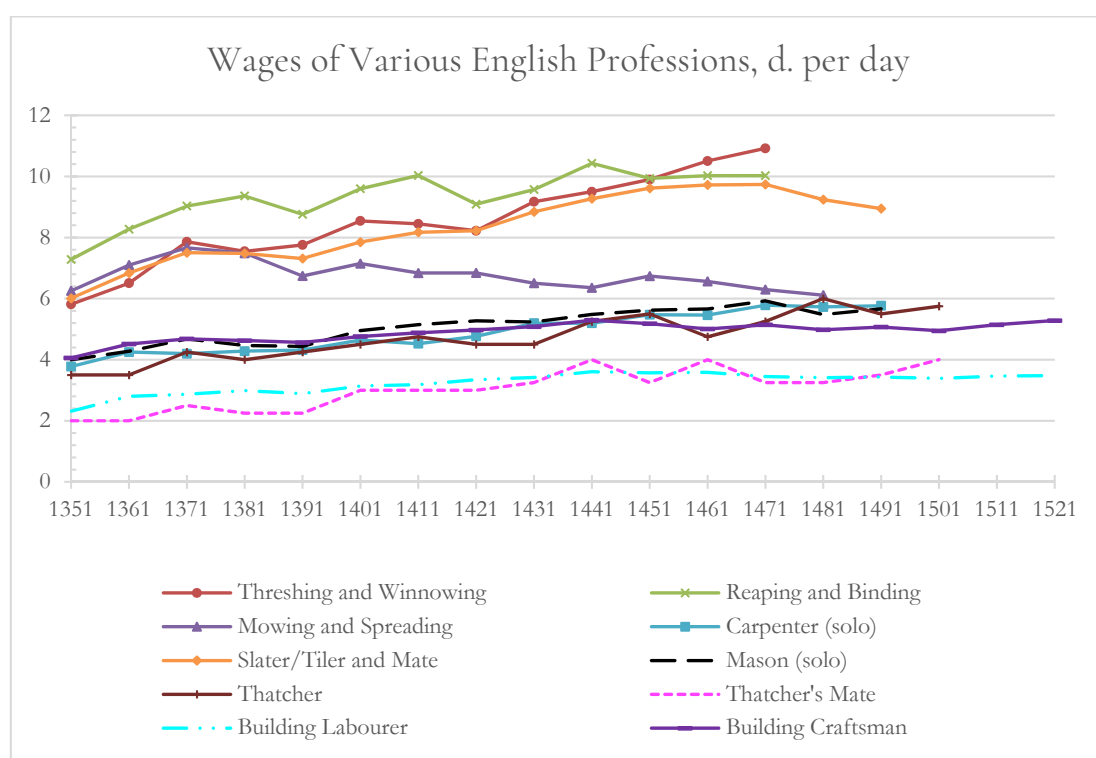


FIGURE 4.18

[Farmer, 'Prices and Wages', pp. 516–20; Munro, 'English Prices and Wages Data' (29 June 2018); Dyer, *Standards of Living*, p. 215.]

There are still a number of problems with English wage data. In addition to the bias towards southern England, Farmer also notes that some of the data is patchy. This is a

⁶¹⁷ Dyer, *Standards of Living*, p. 215.

⁶¹⁸ See Munro, 'English Prices and Wages Data' (29 June 2018).

particular issue for his mowers' wages.⁶¹⁹ Farmer also notes that, due to time pressure, some of the manors are excluded from his regional averages.⁶²⁰ Furthermore, the exclusion of payment in kind from the main indices means that perhaps the total value of English wages was higher than the cash figures suggest. It is also unclear precisely what rank a mason, carpenter or industrial worker had, meaning that comparisons need to be approached with caution.

Figure 4.18 shows that, in contrast to commodity prices and rents, English wages were generally rising throughout the late medieval period. This is precisely what we would expect in a situation where population levels remained low and even continued to decline, while the currency remained stable and was spared from aggressive debasement. If the supply of labour declined faster than the demand for it, then wages should have risen. Likewise, a falling population reduced the demand for commodities and land, lowering their respective values.

Though the general trend of most English wages was upward, there are a number of waypoints in the data that demand attention. Notably, it was more common for industrial wages to stave off any increase until the 1370s. Agrarian wages rose much more readily in the immediate aftermath of the Black Death. This difference might be the result of demand—there was pressure to deal with harvests, so agrarian employers might have been more susceptible to employee demands for higher wages. Indeed, masons and builders

⁶¹⁹ Though, as stated above, Farmer's thatchers' wages are not included in this thesis, see Farmer, 'Prices and Wages', pp. 473–4, 477.

⁶²⁰ One such example is the bishopric of Worcester's manors. See *ibid.*, p. 495.

saw wage increases as soon as the 1360s, perhaps also the result of urgency for their services, should they be needed for repair work.

It is also evident that, especially in the agrarian sector, there was a drop in wages during the 1390s. This could well be the impact of the bullion famine—given that the availability of coin in the countryside was very much a seasonal occurrence,⁶²¹ one would expect that any shortage of small change (or of bullion generally) was exacerbated in rural areas. However, the majority of the wages show no clear impact of a slump in the middle of the fifteenth century—thatchers' mates were the only ones to have a clear reduction in their day wage in the 1450s.

There is also no clear impact of poor harvests on wages. The harvest failures of the 1430s and 1480s, which had caused such pronounced changes in commodity prices, left wages largely unscathed. Perhaps this is unsurprising because the general modern consensus is that there was little correlation between prices and wages after the Black Death.⁶²² English wages also differed from commodity prices in that they did not see the same characteristic inflation in the early sixteenth century.

Having established the overall trends of English wages, it is possible to discuss variations between different professions. Figure 4.19 shows the change in the wage level of each profession between the 1350s and the 1400s. It is evident that unskilled labourers

⁶²¹ Spufford, *Money and Its Use*, p. 385.

⁶²² Farmer, 'Prices and Wages', p. 468. Woodward is the only historian of the period that I have found who suggests that prices and wages were correlated throughout the medieval period: D. Woodward, *Men at Work: Labourers and Building Craftsmen in the Towns of Northern England, 1450–1750* (Cambridge, 1995), p. 205. He seems to misquote Bolton, who said that 'wages moved with prices, as one would expect, until the 1370s, when the two parted company as the demographic downturn began to bite'. See Bolton, *Medieval English Economy*, p. 78.

saw the greatest increase in their wages following the Black Death; the thatcher's mate and the building labourer saw their wages rise by 50% and 35.63% respectively. At the bottom of the ladder, mowing and spreading, and building craftsmen had wage rises below 20%.⁶²³ Building craftsmen were not the only skilled labourers to lose out—carpenters, masons and thatchers also saw smaller pay rises than some unskilled workers. Perhaps the wages of unskilled labourers had the greatest gains because unskilled labour was in short supply, or (towards the end of the period) it could have been the result of the helpers becoming more qualified. It could also have been that the assistant was now someone more like a journeyman—rather than a customary tenant, one of the manor's *famuli*, or a woman—thus meaning that they could get more done in a day than before.⁶²⁴

	<i>Percentage change from 1350s to 1400s</i>
<i>Thatcher's Mate</i>	50.00%
<i>Threshing and Winnowing</i>	46.90%
<i>Building Labourer</i>	35.63%
<i>Reaping and Binding</i>	31.76%
<i>Slater/Tiler and Mate</i>	30.57%
<i>Thatcher</i>	28.57%
<i>Mason (solo)</i>	23.89%
<i>Carpenter (solo)</i>	22.87%
<i>Building Craftsman</i>	17.30%
<i>Mowing and Spreading</i>	14.30%

FIGURE 4.19
[Derived from Figure 4.18]

Of the agrarian wages, those in threshing and winnowing showed the greatest increase, with workers seeing their salary rise by just under 47%. Threshing and winnowing

⁶²³ Mate also found that the wages of mowers in Barton, Kent, dropped in the middle of the fifteenth century, where they remained at the rate of 7d. for the subsequent three decades. Mate, 'Tenant Farming and Farmers: Kent and Sussex', p. 695.

⁶²⁴ Farmer, 'Prices and Wages', pp. 478–9.

were not jobs that had to be done urgently, and were often left until February or later ‘unless to prepare wheat or winter barley for autumn sowing or to take advantage of good prices for the new harvest if the previous crop had been exhausted’.⁶²⁵ It was common for manors to use customary tenants for the bulk of threshing and winnowing, only hiring additional people when the harvest was particularly plentiful. This again speaks of a potential surge in demand which might have encouraged an upward trend in wages. Indeed, as Chapter 3 showed, harvests were most successful between the 1370s and the 1390s, which closely tallies with the sharpest rise in the wages of threshers and winnowers. It is less likely that this sharp rise in wages was entirely the result of population decline or a vast increase in the per capita availability of money because the wages of threshing and winnowing started to rise in the 1360s, which is sooner than the general rise in most other professions’ wages.

Though Figure 4.19 shows that masons had a slightly better increase in wages than carpenters in the second half of the fourteenth century, carpenters saw a better overall wage increase throughout the entire period. As Figure 4.18 shows, the wages of carpenters were below those of masons in the 1350s, but carpenters were earning more than masons by the 1490s. However, both were generally earning around 6d. per day, which was a level confirmed by the 1495 revision of the Statute of Labourers.⁶²⁶ The relative long-term gain of carpenters could have been because they were often doing repairs, and could thus demand a higher wage to repair storm damage, whereas masons were often employed for

⁶²⁵ *Ibid.*, p. 468.

⁶²⁶ *Ibid.*, pp. 476–7.

new builds.⁶²⁷ In contrast to many agrarian wages, those of builders, carpenters, tilers, masons and thatchers did not start to rise until the 1370s. This could be the result of many manors avoiding succumbing to the effects of a declining population by refusing to pay higher wages. For example, Winchester and Westminster manors employed very few masons in the 1350s, and seem to have avoided paying more than 4d. per day. It was not until the 1370s that day wages of about 4.5d. and 5d. were common.⁶²⁸

Though the wage data discussed so far centres on the south of England, there are enough scanty patches of regional wage data to allow us to build up an image of variations across select parts of the country. Despite the assertion from Classical economist Adam Smith that wages had a great amount of regional variation, twentieth-century historians have found evidence to the contrary for the late medieval period.⁶²⁹ Knoop and Jones found that there was little variation in the wages paid to masons at Oxford and Cambridge, but masons working in London could expect about 30% more in the second half of the fifteenth century—6d. per day was the going rate in Oxford and Cambridge, but the London Bridge accounts show masons were paid 8d.⁶³⁰ This wage of around 6d. per day in Oxford and Cambridge seems to be largely in keeping with the wages of craftsmen in Yorkshire. In Beverley, craftsmen were paid 6d. per day in 1494, 5–6d. per day in Durham in the 1470s–1510s, 6d. per day in late fifteenth- and early sixteenth-century Hull,

⁶²⁷ *Ibid.*, p. 476.

⁶²⁸ *Ibid.*, pp. 476–7.

⁶²⁹ Smith, *Wealth of Nations*, p. 79.

⁶³⁰ Knoop and Jones, *Mediaeval Mason*, p. 211.

and 5–6d. per day in Newcastle between 1508 and 1511. Meanwhile, the presumably unskilled labourers were paid about 4d. per day in the above places.⁶³¹ It seems to be the case that wages outside London were *fairly* consistent, with just the capital commanding unusually high pay.⁶³²

We might suppose that this consistency was the result of the success of the various incarnations of the Statute of Labourers. In 1351 the Statute had attempted to fix wages to pre-Black Death levels, but implied that wages had to take into account the inclusion of food or drink. The wages of master carpenters were fixed at 4d. per day, and the other carpenters got 3d. per day in summer, providing that food and drink was not included.⁶³³ The revision of the Statute of Labourers in 1495 went further and specified the wages of professions, giving two levels—one with food, and one without. The average price for a craftsman, apparently not of master grade, was 6d. per day without food. Female labourers (of an unknown skill level) could expect 4.5d. per day without food, while general unskilled labourers could expect 4d. per day without food outside of harvest time. Apart from in London, the rates set out by the 1495 Statute appears to have been followed fairly closely, or rather, the Statute set rates at the current prevalent wage levels. Indeed, the latter seems more likely given that the 1495 Statute set the rate for mowers at 6d. per day without food, which is on a par with the rate shown in Figure 4.18 in the 1480s.⁶³⁴ The

⁶³¹ Woodward, *Men at Work*, pp. 253, 260, 263, 271. For more examples of wages in Durham, see R. Britnell, 'Labour Turnover and Wage Rates on the Demesnes of Durham Priory, 1370–1470', in M. Allen and D. Coffman (eds), *Money, Prices and Wages: Essays in Honour of Professor Nicholas Mayhew* (Basingstoke, 2015), pp. 158–79.

⁶³² A point noted by Phelps Brown and Hopkins, 'Seven Centuries', p. 200.

⁶³³ *PROME*, ii, p. 234.

⁶³⁴ *Ibid.*, te, vi, p. 508.

wages of mowers had been trending downwards for the entire century, and it is unlikely that the legislation had been responsible for this—it appears to have merely confirmed the wage rate prevalent in the 1490s.

A number of preliminary observations about English wages have become clear. First, wage rates, in contrast to rents and commodity prices, saw persistent inflation throughout the late fourteenth and fifteenth centuries. Unskilled labour had the greatest increase in value during this period, breaking with customary ratios and closing the pay gap between senior and junior employees.⁶³⁵ Agrarian wages appear to have had a better day rate, and those who worked in professions where they might be required to carry out work with time pressure saw their wages increase sooner than the 1370s. Regional variation in wages also appears to have been minimal, with only London commanding a significantly higher wage than elsewhere.⁶³⁶

4.2.2 FLEMISH AND BRABANTINE WAGES

As in England, there is a good amount of wage data for Flanders and Brabant. In contrast to England, however, the data tends to be craft wages from urban commercial centres—there does not appear to be any agrarian wage data. The bulk of the Brabantine wage data has been assembled by Herman van der Wee,⁶³⁷ and then adapted by John Munro, who also compiled a number of sets of Flemish wage data.⁶³⁸ The data provided in Munro's

⁶³⁵ See Woodward, *Men at Work*, p. 205 for a brief discussion of customs and wage ratios.

⁶³⁶ Though some variation could also have been caused by varying numbers of days worked per year. This will be discussed below, p. 327.

⁶³⁷ Van der Wee, *Growth of the Antwerp Market*, i, pp. 333–447.

⁶³⁸ Munro sets out his data sources in Munro, 'Builders' Wages', p. 1016.

work covers wages in the cities of Bruges, Antwerp and Lier.⁶³⁹ Though almost all the available wage data for the southern Low Countries is focused on cities, Soens has gathered a small set of unskilled wage data from the Blankenbergse watering, which offers an insight into the value of slightly more rural labour. Work at the Blankenbergse watering was presumably mostly for the maintenance of the dyke and for draining activities, which formed a substantial part of rural work in Flanders.⁶⁴⁰ Tackling the Flemish wage data first, when all the sets of wages are compared, a distinct trend emerges [Figure 4.20].

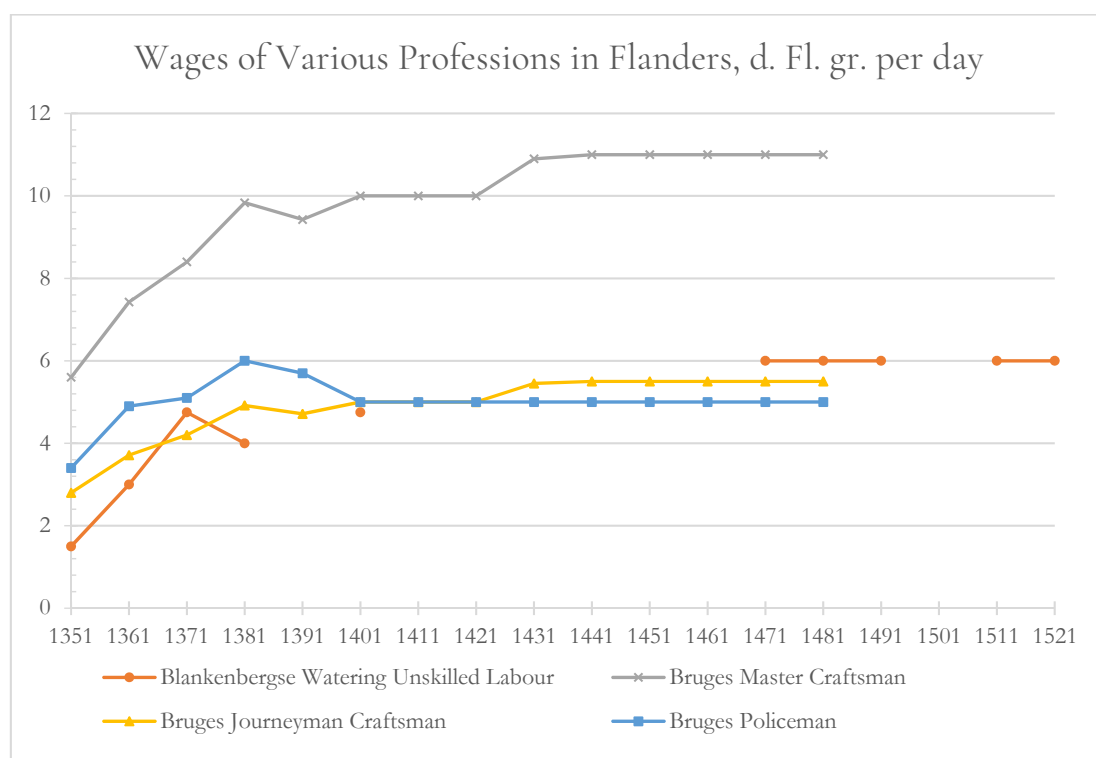


FIGURE 4.20

[Soens, 'Floods and Money', p. 341; Munro, 'Flemish Prices and Wages Data' (29 June

⁶³⁹ See Munro, 'Flemish Prices and Wages Data' (29 June 2018); Munro, 'Brabantine Prices and Wages Data' (29 June 2018).

⁶⁴⁰ Soens, 'Floods and Money', p. 341; B. J. P. van Bavel, 'Rural Wage Labour in the Sixteenth Century Low Countries: An Assessment of the Importance and Nature of Wage Labour in the Countryside of Holland, Guelders and Flanders', *Continuity and Change*, Vol. 21, No. 1 (2006), p. 50.

2018).]

Wages in Flanders rose the most in the last half of the fourteenth century, before settling into a period of 'stickiness' for the bulk of the fifteenth century. Flemish wages were on the increase from the 1360s, which was sooner than for most craft wages in England. This might have been the result of heavy debasements causing inflation, as was seen with commodity prices in Chapter 3. The inflation was curtailed in the period from the 1380s to the 1420s, when Flanders experimented with a combination of reinforcement and debasement in quick succession. Wage stickiness seems to have occurred during the period when Philip the Good was experimenting with a *laissez-faire* monetary policy, forgoing any debasement or reinforcements of the currency between 1433 and the 1460s. The resumption of debasement in the 1460s does not seem to have caused a reaction in wages as it had done in the late fourteenth century, however. There was also no evident impact of poor harvests in Flanders. The 1430s, 1450s and 1480s brought no change in wages as the stickiness prevailed.

In contrast to England, where the wages of unskilled labourers made substantial gains on wages of the skilled, the pay ratio between skilled and unskilled remained fixed throughout the late medieval period. The wages of the Bruges master craftsman and the Bruges journeyman craftsman correlate to a perfect 1. There was still a close link between the unskilled labour at the Blankenbergse watering and the Bruges master craftsman, with both sets of data correlating to 0.94, a very strong positive correlation.

The overall trends of Brabantine wages were much the same as in Flanders [Figure 4.21]. Though the data starts in 1400, it extends beyond 1500. There is the same levelling

of wages in the 1400s and 1410s before the inflation in the 1420s and 1430s. Notably, the extension of data beyond 1500 allows us to see that wages in Brabant did have the same characteristic inflation as commodity prices in the early sixteenth century. Again, in contrast to commodity prices, there is little evidence that any of the poor harvests in the fifteenth century had any impact on wage levels; only a slight uptick of master wages in Antwerp in the 1480s is present. There is slightly less stickiness in the Brabantine data, but this might be the result of potential compositional errors in van der Wee's data—if he took averages of the available data for each year, then this might have led to the false impression of minor fluctuations in wage levels.⁶⁴¹

As was the case with Flanders, there is a close correlation between the wages of skilled and unskilled in Brabant. The Antwerp master mason and mason labourer's wages correlate to 0.98, indicating that the ratio of labour value remained closely in step over the late medieval period. Limited though the Lier data might be, for the three decades where data is available, the correlation among skilled labour wages was much lower. Master carpenters' wages in Antwerp and Lier correlated to 0.7 and the master masons' wages correlated to 0.8. Both of these are still strong correlations, but there is evidence of regional variation in wage rates. Interestingly, the value of unskilled labour in Brabant appears to have been much more standardised, with mason labourers' wages in Antwerp and Lier correlating to 1.

It appears that wages in Flanders and Brabant were much more akin to the trends

⁶⁴¹ For a discussion of compositional errors in medieval wage data, see Munro, 'Wage-Stickiness', pp. 196–7.

seen in commodity prices. Though there was regional variation in the value of labour, the overall trends were largely the same across Flanders and Brabant. There was pronounced inflation in the second half of the fourteenth century, which coincided with the demographic reduction and the heavy debasement. Unlike commodity prices, wages were generally ‘sticky’ in the fifteenth century. This appears to have been partly the result of there being no debasements in the period from 1433 to the 1460s, and was also possibly the result of custom (implied by the lack of wage inflation after the resumption of debasement).

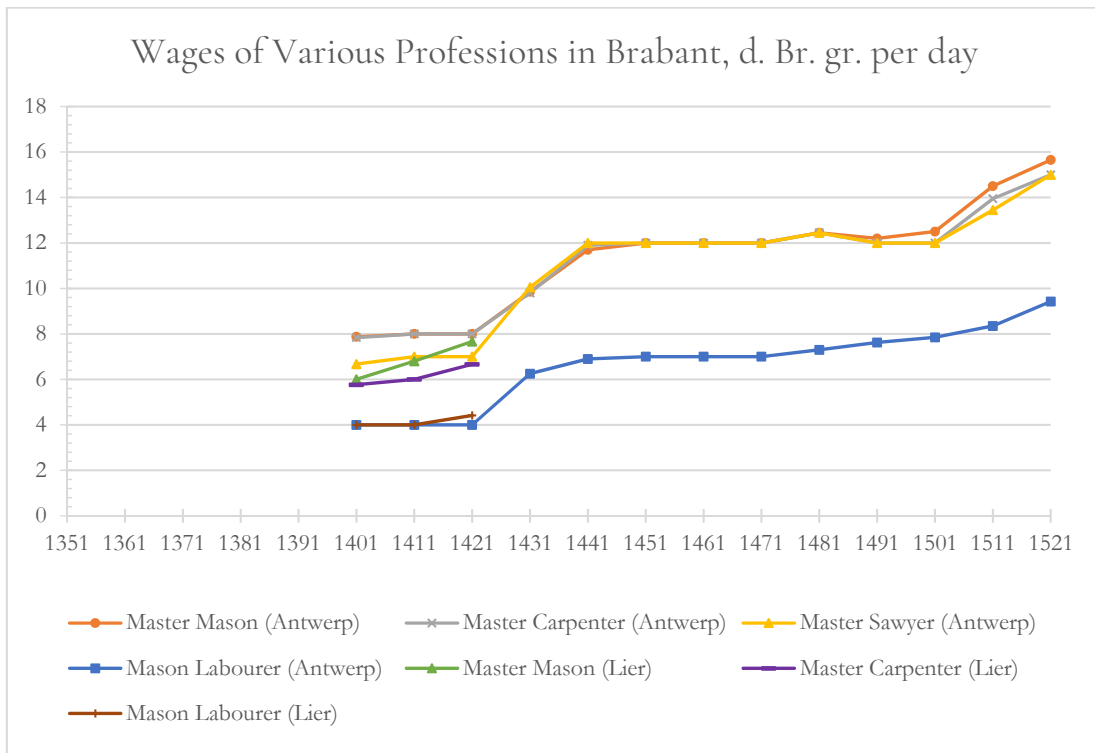


FIGURE 4.21
[Munro, ‘Brabantine Prices and Wages Data’ (29 June 2018).]

4.2.3 WAGES COMPARED

Having established the general trends of wages in England, Flanders and Brabant, and

highlighted regional variations in wage levels, it is now possible to offer some comparisons. Due to the lack of agrarian wages in the Low Countries, these comparisons are based on craft wages. Wages will still be divided into skilled and unskilled labour. As was seen above, there were often several series of skilled and unskilled craft labour, so it has been necessary to construct averages.⁶⁴² Figure 4.22 shows that, in nominal terms, English master craftsmen saw their wages rise much less aggressively than those of the master craftsmen in Brabant and Flanders. This is unsurprising given that it became clear in the previous section that wages in the southern Low Countries were more prone to rising as the severity of debasement increased. It also appears that wages were far more prone to stickiness in the Low Countries once the monetary stability following the 1433 unification had come into force—in England there was no wild fluctuation of wages either, but there is a trend of wages gradually creeping upwards as the fifteenth century wore on.⁶⁴³ This gradual inflation was despite attempts by craft guilds to impose maximum wage levels, which appear to have been largely ignored.⁶⁴⁴ By comparison, Figure 4.23 shows that, though unskilled wages in the Low Countries followed largely the same trends as skilled wages, there was more fluctuation in unskilled English wages.

It has been suggested over the last two sections that English wages seemed to be responding to changes in population level, while wages in the Low Countries were mainly driven by debasement. These theories can be further tested by using log-log regression.

⁶⁴² These averages were taken if more than half of the relevant datasets had an entry for a given decade. If fewer than half of the series had an entry, no average was taken.

⁶⁴³ Hatcher is notably very critical of the validity of sticky wages in England, largely because they are shown in limited sources, mostly from institutional employers. Hatcher, 'Great Slump', pp. 262–3.

⁶⁴⁴ Van der Wee, *Growth of the Antwerp Market*, i, p. 46.

In contrast to the rental data, it is possible to regress annual wage data due to the greater abundance of observations. This has the advantage of far greater statistical accuracy, and thus it is unnecessary to supplement the regression analysis with a correlation matrix.

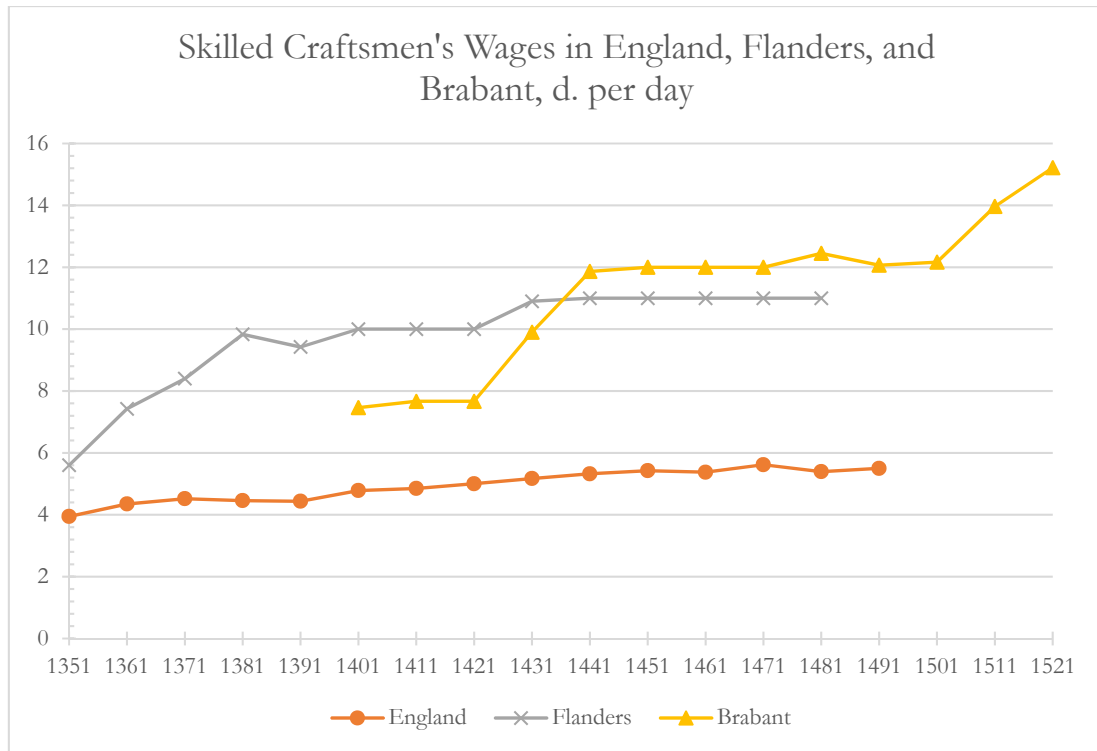


FIGURE 4.22
[As Figures 4.18, 4.20 and 4.21]

Figure 4.24.1 gives the results from log-log regression where all the independent variables are combined to demonstrate the results of them all interacting with wage levels simultaneously. For England, it is evident that the strongest and most significant coefficients are to be found in the impact of the debasement of the silver currency. Significant at the 1% level for skilled wages and at the 5% level for unskilled wages, the coefficients suggest that a 1% increase in the weight of the silver currency would have caused a 1.822% and 1.252% decrease in the wages of skilled and unskilled craftsmen respectively. As has been the case for most combined log-log regressions in this thesis so far, the possibility

of multicollinearity remains present, as indicated by the positive coefficient of the weight of the gold currency's impact on wages. The effect of mint output on English skilled and unskilled wages is also significant at the 1% level, though the coefficient is extremely weak, suggesting that the relationship was minimal. Furthermore, the coefficient is negative, and this is unexpected if we assume that high mint output would have hinted at an increase in the money stock—instead, it seems that, as mint output fell, wages rose. This appears nonsensical and thus, within the context of combined regression, we must dismiss mint output as a driver of English wages. Though there is no significant link between population levels and skilled wage rates in England, the regression suggests that population was a significant driver of unskilled wage levels. In this case, a 1% increase in population would cause unskilled wages to fall by 0.497%. This is consistent with our expected relationship between population and wages where the demographic theory would dictate that a negative correlation would be indicative of population pressures influencing trends. Finally, significant only at the 10% level, there was a weak positive link between the prices of the baskets of consumables and both skilled and unskilled wage rates. This is unsurprising because the English baskets of consumables contained some manufactured goods, the prices of which would have been in part dictated by the general wage level on account of 'value added'.

The results of the Flemish and Brabantine regressions are somewhat different from England's. The common ground can be seen to be the inverse relationship between the debasement of the silver currency and both skilled and unskilled wages. For Flanders, multicollinearity is again present, as indicated by the positive coefficients of the weight

of the gold currency. Population's influence on wage rates in Flanders is significant at the 1% level, but the positive coefficient does not fit with the demographic theory—here it is suggested that as population levels rose, so did wages! The influence of the general price level is also significant at the 1% level, though the negative coefficients suggest that the prices of baskets of consumables rose as wages fell. In Brabant, it is also apparent that the debasement of the silver currency was highly linked to the rising wage rates of both skilled and unskilled workers. There is no statistically significant impact of mint output or the prices of baskets of consumables. However, as was the case with Flanders, population levels show a strong positive coefficient significant at the 1% level.

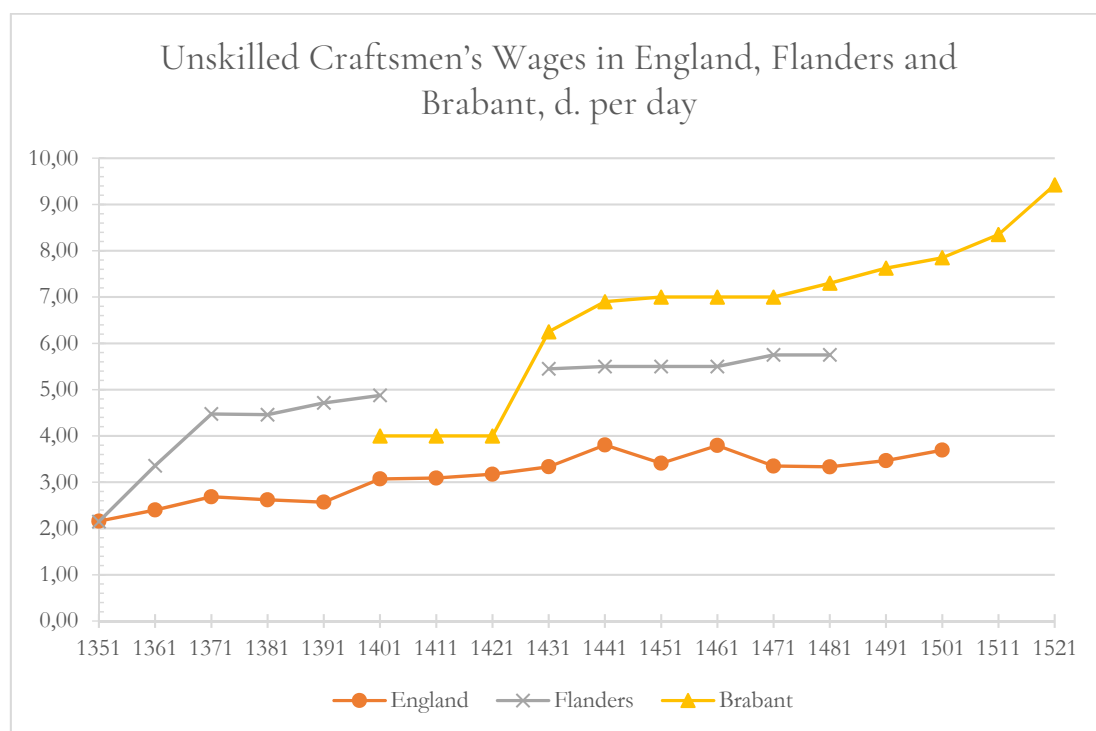


FIGURE 4.23
[As Figures 4.18, 4.20 and 4.21]

The combined regression has shown us that population levels played some role in English wage trends, while the role of debasement and mint output has been difficult to

discern. In Brabant, the debasement of the currency was the clearest driver of wage levels, but this was less clear for Flanders. It is quite possible that multicollinearity is interfering with many of the results, so it is now necessary to examine the role of each independent variable individually.

Figure 4.24.2 gives the results for regression analysis of individual independent variables. The first observation to be made regarding English wages is that the debasement of both gold and silver was a highly significant driver of skilled and unskilled wage levels. Of all the independent variables, the debasement of the silver currency has the highest explanatory effect, with the r^2 showing that 68.07% of skilled wage movements are accounted for by movements in the weight of the silver currency. This is closely followed by gold, which accounts for 61.62% of skilled wage movements. For unskilled wages, silver explains 41.44% of wage movements, while gold explains 37.21%. In the cases of both skilled and unskilled wages, gold and silver's coefficients are negative, indicating that as the gold and silver currencies gradually declined in weight, wage levels increased. The coefficient of silver is slightly stronger, lending further credence to the argument of Casson and Casson that gold was less inflationary than silver.⁶⁴⁵ The statistical significance of mint output is still present at the 1% level for both skilled and unskilled wages, but the weak and negative coefficient does not offer much explanation of wage movements. Likewise, the statistically insignificant and negative coefficients for the baskets of consumables'

⁶⁴⁵ See p. 169 above.

explanatory power of wage trends are also inadequate. Notably, in contrast to the combined regression, population becomes consistently significant to the 1% level for both skilled and unskilled labour. In both cases, a strong negative coefficient indicates that as population fell (and thus as the workforce contracted in size), wages increased. In the case of unskilled labour, the r^2 of population exceeded that of gold, and fell just short of silver's r^2 . Furthermore, the negative coefficient for population was far stronger than the coefficients of both gold and silver.

	<i>English Skilled Craftsmen</i>	<i>Flemish Skilled Craftsmen</i>	<i>Brabantine Skilled Craftsmen</i>	<i>English Unskilled Craftsmen</i>	<i>Flemish Unskilled Craftsmen</i>	<i>Brabantine Unskilled Craftsmen</i>
<i>d. Weight (silver)</i>	-1.822*** (0.555)	-0.279*** (0.055)	-0.415*** (0.105)	-1.252** (0.565)	-0.279*** (0.055)	-0.483*** (0.111)
<i>d. Weight (gold)</i>	1.079** (0.463)	0.018 (0.05)	-0.078 (0.106)	0.713 (0.494)	0.018 (0.05)	-0.086 (0.116)
<i>Mint Output</i>	-0.028*** (0.007)	-0.004 (0.003)	-0.029 (0.018)	-0.025*** (0.008)	-0.004 (0.003)	-0.019 (0.023)
<i>Population</i>	-0.111 (0.107)	0.932*** (0.141)	0.701*** (0.129)	-0.497*** (0.094)	0.932*** (0.041)	0.613*** (0.148)
<i>Basket of Consumables</i>	0.102* (0.054)	-0.065*** (0.023)	0.108 (0.064)	0.12* (0.068)	-0.065*** (0.023)	0.1 (0.073)
<i>N</i>	51	87	75	69	87	75
<i>R²</i>	0.8877	0.7658	0.6433	0.7577	0.7658	0.6091

FIGURE 4.24.1

Combined Log-Log Regression Analysis of Annual English, Flemish and Brabantine Wages [As Figures 2.5, 2.9, 2.12, 2.16, 2.18, 2.21, 3.28 3, 4.22 and 4.23]

For Flanders, Figure 4.24.2 shows that the debasement of the silver currency explained the greatest amount of the skilled and unskilled wage trends, with an r^2 of 74.38% for both. This was followed by gold, which explained 72.61% of skilled and unskilled wage fluctuations. As was the case for England, the negative coefficient for silver is stronger, furthering the argument that silver was more inflationary than gold. Population also continues to play a highly statistically significant role in Flemish wage trends, explaining

45.12% of the fluctuations. Yet, as was the case for the combined regression, the coefficient is positive, which casts doubt on the validity of the demographic impact on Flemish wages. Mint output, while remaining statistically significant at the 1% level, only explains 9.58% of wage fluctuations, and with a very weak negative coefficient -0.045 , it did not appear to have a great impact on wages in Flanders. Finally, in contrast to the combined regression, the basket of consumables price level is now significant at the 1% level, and explains 20.82% of wage fluctuations. Its strong positive coefficient of 0.422 suggests that there was a reasonable degree of correlation between the general price level and wages.

These findings are largely repeated in the Brabant wage regressions. The debasement of the silver currency is the clearest driver of Brabantine wages, while gold appears far less important, as evidenced by its comparatively low r^2 of 35.42% and 40.23% for skilled and unskilled wages respectively. Mint output does not appear to have been overly influential and, in contrast to the Flemish findings, population's sub-1% r^2 and lack of statistical significance suggests that wages in Brabant were not closely driven by population changes. As in Flanders, the value of the basket of consumables in Brabant is statistically significant at the 1% level, though the high r^2 of 59% shows that there was a closer link between the general price level and skilled and unskilled wages in Brabant. This is probably the result of the Brabantine basket containing a greater amount of industrial goods—indeed, there are 29% more industrial goods in the Brabantine basket.⁶⁴⁶

⁶⁴⁶ See p. 229 for the basket weightings.

	<i>English Skilled Craftsmen</i>					<i>Flemish Skilled Craftsmen</i>					<i>Brabantine Skilled Craftsmen</i>				
<i>d. Weight (silver)</i>	-0.575*** (0.028)					-0.561*** (0.046)					-0.491*** (0.027)				
<i>d. Weight (gold)</i>	-0.468*** (0.025)					-0.497*** (0.041)					-0.328*** (0.06)				
<i>Mint Output</i>	-0.027*** (0.007)					-0.045*** (0.013)					0.058*** (0.021)				
<i>Population</i>	-0.852*** (0.047)					1.213*** (0.15)					0.297 (0.282)				
<i>Basket of Consumables</i>	-0.221 (0.155)					0.422*** (0.093)					0.602*** (0.04)				
<i>N</i>	149	149	149	149	51	135	105	109	116	135	131	96	82	127	131
<i>R²</i>	0.6807	0.6162	0.083	0.5596	0.0539	0.7438	0.7261	0.0958	0.4512	0.2083	0.6719	0.3542	0.1281	0.0071	0.5935
	<i>English Unskilled Craftsmen</i>					<i>Flemish Unskilled Craftsmen</i>					<i>Brabantine Unskilled Craftsmen</i>				
<i>d. Weight (silver)</i>	-0.462*** (0.041)					-0.561*** (0.046)					-0.618*** (0.034)				
<i>d. Weight (gold)</i>	-0.239*** (0.034)					-0.497*** (0.041)					-0.407*** (0.076)				
<i>Mint Output</i>	-0.24** (0.01)					-0.045*** (0.013)					0.079*** (0.026)				
<i>Population</i>	-0.853*** (0.095)					1.213*** (0.15)					0.157 (0.35)				
<i>Basket of Consumables</i>	-0.117 (0.087)					0.422*** (0.093)					0.746*** (0.051)				
<i>N</i>	180	180	180	180	69	135	105	109	116	135	131	96	82	127	131
<i>R²</i>	0.4144	0.3721	0.0483	0.406	0.0139	0.7438	0.7261	0.0958	0.4512	0.2083	0.6872	0.4023	0.1702	0.0013	0.59

FIGURE 4.24.2
Individual Log-Log Regression Analysis of Annual English, Flemish and Brabantine Wages
[As Figure 4.24.1]

The combined and individual regression analyses have shown that population was a clear driver of both skilled and unskilled wage levels in England. However, the results also suggest that the gradual reduction of the English gold and silver currencies was potentially significant as a driver of wage levels. While it is possible that this relationship is spurious because debasement seems to have had little impact on prices and rents in England, it is not possible to entirely discount the role of debasement on wage trends.⁶⁴⁷ In Flanders and Brabant the debasements of the silver and gold currencies were generally the most important causes of wages inflation, even though it is also clear from Section 4.2.2 that wages in the Low Countries also had periods of stickiness. Are these conclusions particular to the Low Countries? Anecdotal evidence from Scotland suggests not.

We can find a good deal of evidence of wage stickiness in Scotland. In addition to the rent data contained within the *Cupar Angus* rent book, there is a small amount of wage data to be found at the end of the first volume. The abbey appears to have employed a large number of manual labourers, with there being numerous concurrent contracts for masons, tilers, carpenters, and men to work in the smithy. However, unlike the rent data where there was generally a trend of inflation, there appears to have been little change in wages for manual labour. In 1468, Robert Wrycht, Thomas Wrycht and Thomas Bel, all carpenters, were paid 5 marks for a year's labour.⁶⁴⁸ Almost two decades later, in 1485, John the mason was paid 5 marks per year on a 5-year employment contract.⁶⁴⁹ In 1492,

⁶⁴⁷ These findings can be seen clearly in the regression analyses of baskets of consumables and wage levels. See p. 236 and p. 275.

⁶⁴⁸ *Cupar-Angus*, i, pp. 304, 305.

⁶⁴⁹ *Cupar-Angus*, i, p. 307.

Thomas Mowtray, another mason, was also paid 5 marks a year for a 5-year contract.⁶⁵⁰ It seems that, even more so than rents, the value and length of an employment contract was more determined by the quality and behaviour of the individual than it was by the quantity or quality of the money in circulation. Coupar Angus also seems to have included food and drink in their employment arrangement, which, to a certain extent, should have offset the need to increase cash wages to compensate for debasement.

Evidence from Bute Castle suggests that the wages of castle porters were fixed by custom. Between 1440 and 1464 we have almost annual entries for the wage of the porter of this castle. Though his wage is described in different terms for most entries, whether it was a payment for one year, a backdated payment for a previous year, or his termly fee, the porter was always paid 40s. annually. In addition, he was usually given 32s. of oatmeal per year, which was typically one chaldron, though after 1454 this does appear to have increased to two chaldrons. These payments, in both cash and kind, seem to have been 'sticky' or 'fossilised'. This is also true of the wages of Stirling Castle's porters, who, having had oatmeal added to their wages in 1471, consistently received 1 chaldron annually until 1514, which was also apparently always worth 32s. Before the addition of oatmeal, cash wages did appear to change. In 1388 the porter was apparently paid just 10s. for the year, but received 40s. annually in 1434.⁶⁵¹ This put the Stirling porters in line with those of Bute, again suggesting that there was an accepted 'going rate' for the job.

Despite all the evidence for wage stickiness in Scotland, there is also an indication

⁶⁵⁰ *Cupar-Angus*, i, p. 304.

⁶⁵¹ *ER*, v, pp. 83, 84, 163, 250, 288, 332, 363, 409, 410, 451, 452, 573, 574, 664; *ER*, vi, pp. 45, 230, 328, 329, 420, 532, 533, 628; *ER*, vii, pp. 12, 108, 274.

that adjustments were made to wages to compensate for the Scottish currency's debasement. The only example of a wage rise at Coupar Angus was that given to Thomas Mowtray when, in 1497, he was given a lifelong employment contract for 6 marks per year, a 20% pay rise.⁶⁵² We cannot be sure whether Mowtray's pay rise was a bonus for his achievement in securing a lifelong employment contract or whether it was intended to offset debasement, but evidence from elsewhere gives clear impressions of corrective wage changes. Scotland did not pay its soldiers for most of the late medieval period, but this changed towards the end of the fifteenth century. In 1482, pikemen at the Berwick garrison were paid 2s. 6d. per day, and archers were paid 2s. per day.⁶⁵³ If we convert both of these wages into grains of silver using the data set out in Figure 2.5, then pikemen received 92.4 grains of silver per day and the archers were paid 73.92 grains of silver per day. English archers, like the Bruges policemen, were paid the same wage year after year. They received 6d. per day,⁶⁵⁴ which equates to 67 grains of silver. It appears, therefore, that the Scots must have used the equivalent silver weight of English archers' wages as a basis for the establishment of their own archers' pay.

There is also evidence to suggest that the Scottish crown was looking to English wages for a benchmark when deciding how to compensate their own masons. On 19 March 1502, John Marser was paid 10s. a week for his role as mason and work on the tower of the toll booth at Edinburgh.⁶⁵⁵ This wage of 10s. in Scottish money equates to 367.32 grains of

⁶⁵² *Cupar-Angus*, i, pp. 309–10.

⁶⁵³ *RPS*, 28 March 1482.

⁶⁵⁴ A. R. Bell, A. Curry, A. Kingand, D. Simpkin, *The Soldier in Late Medieval England* (Oxford, 2013), pp. 152–3.

⁶⁵⁵ R. S. Mylne, *The Master Masons to the Crown of Scotland and Their Works* (Edinburgh, 1893), p. 9.

silver per week. That amount of silver would have been equivalent to 30.61d. in English money. Assuming a working week of six days, John Marser was paid the equivalent of 5.1d. per day in English money. The wages were certainly not far off the pay given to English masons, which the 1495 Statute had set at 6d. per day without food. Given the prevalent Scottish custom of payment in kind, it is not impossible that Marser was also given food and drink while he worked. In addition to the employment of John Marser, five apparently lesser masons were also employed for the job. Their pay was lower, at 9s. per week,⁶⁵⁶ equating to a daily pay of 4.62d. in English money. Whether they can be classified as unskilled journeymen is dubious given that the contract refers to them as masons, but the wording certainly implies that they were of lower rank than Marser. Again, since unskilled labourers were earning about 4d. per day in England, these lower-ranking Scottish masons were not paid too badly. Indeed, the most senior masons could expect generous pay from the Scottish crown. On 20 June 1499, James IV granted Wat Merlyon an annual pension of £40 Scots.⁶⁵⁷ Assuming he was being compensated for a working year of 240 days, this equates to 10.2d. per day in English money.

This analysis of wages has offered a number of conclusions so far. Changes in absolute wage levels in England were most likely linked to the fluctuations in population level. English wage inflation forms a stark contrast to the deflation of commodity prices and land rents, which is in keeping with expectations from an economy with little debase-

⁶⁵⁶ *Ibid.*, p. 9.

⁶⁵⁷ *Ibid.*, p. 10.

ment but a declining population. In economies where there was a lot of aggressive debasement—notably Flanders, Brabant and Scotland—on the surface, wages seem to have generally compensated. Regression analysis found that there was a strong link between the rate of debasement in the southern Low Countries and the change in wage levels. Even in Scotland, where wage stickiness was prevalent (such as at Bute Castle and Coupar Angus), workers were also paid with food and drink in addition to their cash wages. Some Scottish professionals, such as soldiers and masons for the crown, were paid a wage which appeared to compensate for debasement because it seems to have been roughly equal to the equivalent wage in England.

However, because the regression analysis has offered conclusions in line with those found for prices and rents, we must ask how much the inflation of wages in Flanders, Brabant and Scotland was offset by the falling silver content of the currency and the corresponding rising cost of food. Thus, it is difficult to know whether any of the wage increases in countries where debasement was common actually translated into real gains over wages in other countries. The next section addresses this question.

4.2.4 THE RELATIVE VALUE OF LABOUR AND REAL WAGES

One of the core aims of this thesis is comparison. So far, only wages in local currencies have been examined. This is useful for gauging trends and comparing them with debasement, but it gives no indication of where labour was worth the most. As we have seen above, the most straightforward way of testing whether wages were worth more in one

region than another is by converting the nominal cash wages into grains of silver.⁶⁵⁸ Figure 4.25 shows that the silver wages of skilled craftsmen declined rapidly in Flanders and Brabant throughout the fifteenth century. In England, the decline is not so prominent, and it appears that the inflation of wages largely offset the gradual lightening of the English penny. The English unskilled labourers fared better—Figure 4.26 shows that even when converted to grains of silver, their wages were increasing for most of the period, falling only in the last three decades of the fifteenth century. As expected from the close correlation between skilled and unskilled wages in Flanders and Brabant, silver wages for unskilled labour decreased at a similar rate to those of skilled labour.

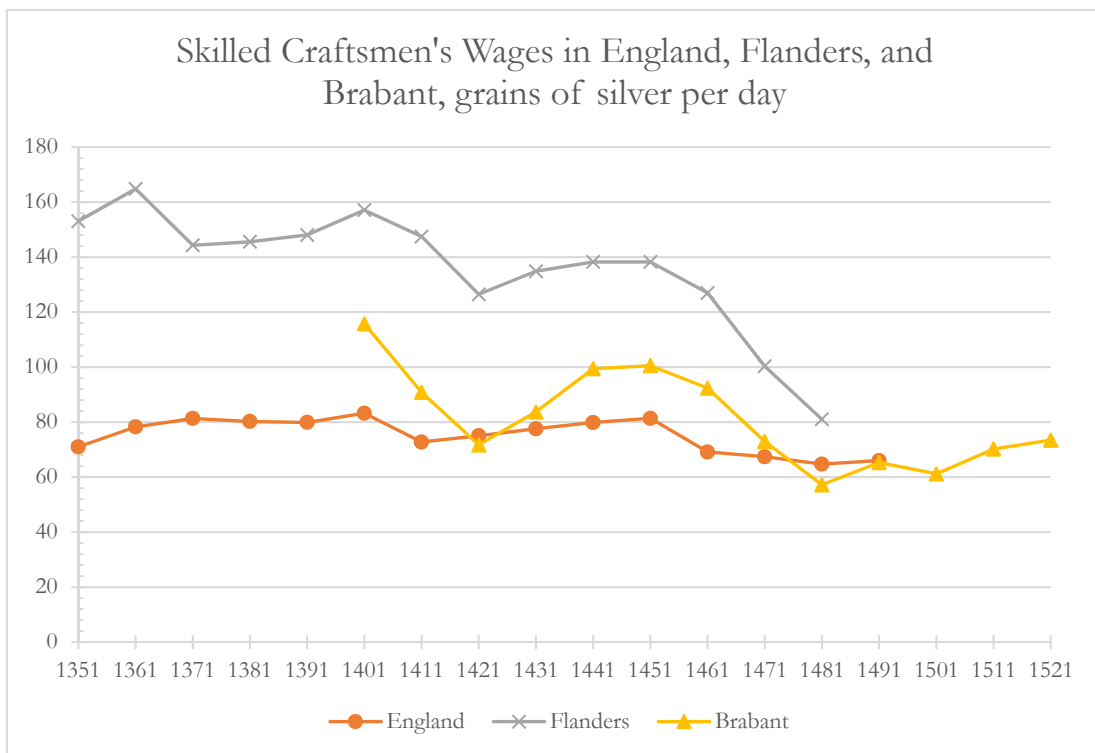


FIGURE 4.25
[As Figures 2.5 and 4.22]

⁶⁵⁸ See p. 321.

A number of interesting observations also emerge from looking at the wages of skilled and unskilled labourers. Primarily, it is clear that skilled labour was worth more in the Low Countries than in England, and both skilled and unskilled labour were worth more in Flanders than in Brabant. The gap between Flemish and Brabantine skilled and unskilled wages narrowed after the 1480s. This might well have been a reflection of Brabant's increasing economic prosperity. In the late fifteenth century, Brabant had become increasingly commercialised, benefitting hugely from the currency devaluation of 1465, which—combined with the commercial treaty signed between England and the Burgundian Netherlands in 1467—allowed Antwerp to expand into the key trade centre of western Europe.⁶⁵⁹ One might anticipate that this commercial growth raised the demand for labour and increased the size of the money stock in Brabant. It is thus unsurprising that both skilled and unskilled wages in silver terms declined less rapidly in Brabant during the second half of the fifteenth century than in Flanders, which ultimately brought Flemish and Brabantine unskilled silver-terms wages to parity in the 1480s.⁶⁶⁰

Though unskilled labour in England was on a par with Brabant for most of the fifteenth century, and eventually wages slightly exceeded the going rates in both Flanders and Brabant after the 1480s, Figure 4.25 showed that skilled labour commanded a lower

⁶⁵⁹ Van der Wee, *Growth of the Antwerp Market*, ii, pp. 69–83. Of course, the expansion of Antwerp had not been instantaneous, and the fact that by the 1440s the Medici were sending their agents in Bruges to Antwerp to procure paintings and tapestries, suggests that Antwerp's fortunes had been improving since the second quarter of the fourteenth century. See T. Hulst, *A History of the Western Art Market: A Sourcebook of Writings on Artists, Dealers, and Markets* (Oakland, 2017), p. 140.

⁶⁶⁰ Though in nominal terms, wages in Brabant had exceeded those of Flanders a few decades earlier on account of the Brabantine wages benefitting from a very minor upward drift throughout the central decades of the fifteenth century. See Figures 4.22 and 4.23. It is likely that the skilled wages in Brabant and Flanders also would have equalised, if data existed beyond the 1480s.

premium throughout most of the fifteenth century. This is most likely because the wage data for England is not drawn from London, whereas the Low Countries data is invariably taken from the big commercial centres. If rural wages in England were lower than London wages, they were almost certainly lower than wages in the big commercial centres in the Low Countries. Furthermore, the wages paid in the cities were more likely to be from commercial or ducal employers, whereas those paid on English manors were from ecclesiastical and/or rural employers.⁶⁶¹ It is reasonable to expect that rural and ecclesiastical employers would have paid less than commercial or regal employers. This is demonstrated by the example of Thomas Mowtray, the mason at Coupar Angus Abbey, who earned 5 marks a year compared with John Marser (employed by the Scottish Crown), who earned 10s. a week. Assuming a working year of 240 days, Mowtray's daily pay equated to 3.3d., whereas Marser was earning 20d.! Thus, it is unsurprising that English skilled wages appear lower than those in the Low Countries.

In addition to the issue of employer variation, using silver wages to gauge where labour was the most valuable can be flawed; wages expressed in silver grains reflect the changing value of both labour and silver. It has also been mentioned that in every region apart from England, wage inflation was met with commodity price inflation. What impact did this have on purchasing power, and was England's experience once again unique?

Real wages are the most common way to study changes in purchasing power and provide a better indication of changes in purchasing power than wages expressed in grains

⁶⁶¹ See below, p. 331.

of silver. Real wages are calculated as a measure of how many baskets of consumables can be bought for a year's salary. They have formed a core part of the analyses of living standards, most notably used by Phelps Brown and Hopkins.⁶⁶² Clark, Munro and Hatcher have all made extensive use of real wages when attempting to discuss how living standards changed in England after the Black Death.⁶⁶³ Munro's data [Figure 4.27] offers a number of preliminary observations. Standards of living appear to have been best in Flanders, with their masters and policemen having the greatest purchasing power of all. Combined with the impression of low English wages given by Figures 4.25 and 4.26, this suggests that perhaps living standards in England were not as good as elsewhere in the fifteenth century. Indeed, this certainly fits with the analysis of European wages given by Robert Allen, who suggested that England was 'a backward, agrarian, low productivity, low wage economy in the late middle ages'; but by contrast, wages in the Low Countries had managed to withstand decline better than less developed economies.⁶⁶⁴

However, before it is concluded that England offered substantially worse standards of living than a craftsman could enjoy in the Low Countries, it is first necessary to closely examine Munro's real wages data. The calculation of historical real wages offers a number of potential pitfalls for the historian. Real wages rely on knowledge of the number of days worked in each profession, which is by no means a figure that can be obtained with certainty. In his calculations, Munro assumed that in England and Flanders, the masters and

⁶⁶² See Phelps Brown and Hopkins, *Perspective of Prices and Wages*.

⁶⁶³ Clark, 'Long March'; Munro, 'Builders' Wages'; Hatcher, 'Unreal Wages'.

⁶⁶⁴ R. C. Allen, 'Economic Structure and Agricultural Productivity in Europe, 1300–1800', *European Review of Economic History*, Vol. 4, No. 1 (2000), pp. 3–4.

journeymen worked for 210 days a year. The real wages of Flemish policemen seem high relative to their low daily wage because Munro assumed that they worked 365 days a year. For Brabant, Munro employed a working year of 240 days in his real wages calculations.⁶⁶⁵ To improve the comparison of real wages in England, Flanders and Brabant, it is worthwhile redoing Munro's calculations but assume 240 working days for all. Figure 4.28 shows that when all professions are assumed to have had a 240-day working year, the Flemish policeman's purchasing power is now below that of the English master, which seems much more reasonable. Unskilled labourers in Flanders and England were roughly on a par in their real wages, with unskilled labourers in Brabant having come off worse. The Flemish master still appears to have been extremely well-off, however.

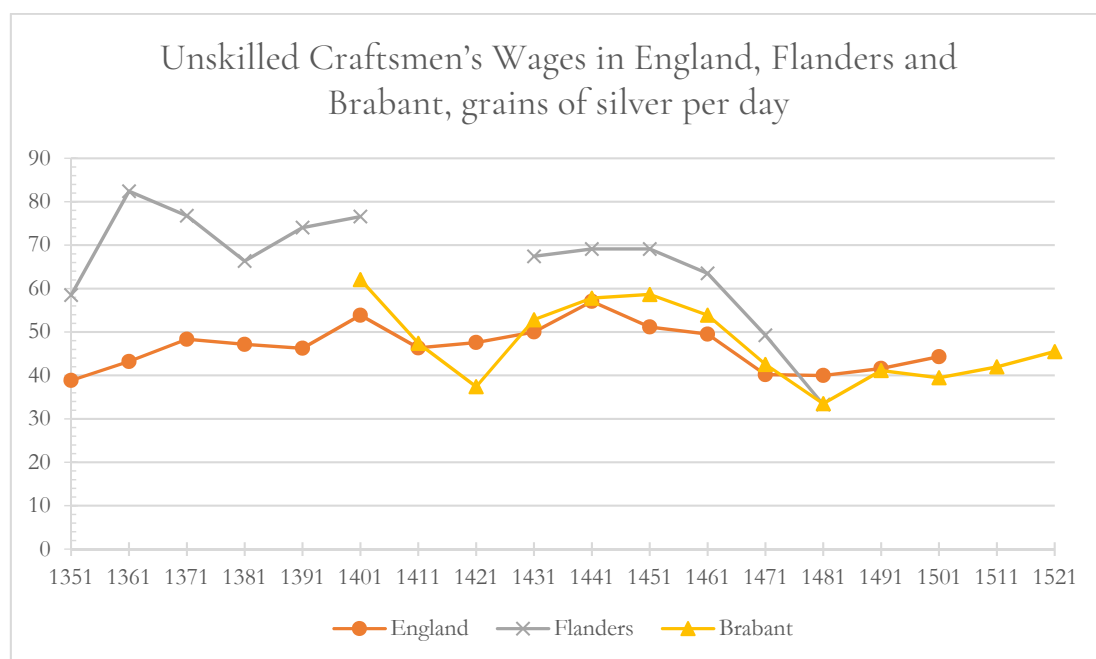


FIGURE 4.26
[Figures 2.5 and 4.23]

⁶⁶⁵ See Munro, 'English Prices and Wages Data' (29 June 2018); Munro, 'Flemish Prices and Wages Data' (29 June 2018); Munro, 'Brabantine Prices and Wages Data' (29 June 2018).

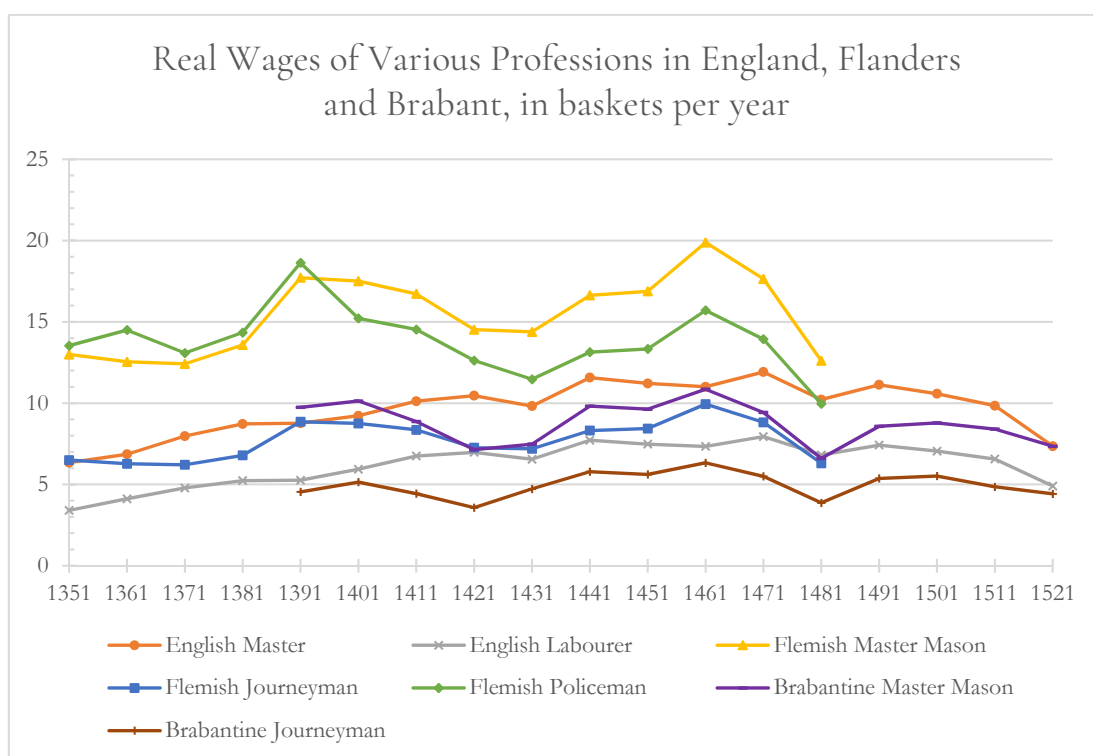


FIGURE 4.27

[Munro, 'English Prices and Wages Data' (29 June 2018); Munro, 'Flemish Prices and Wages Data' (29 June 2018); Munro, 'Brabantine Prices and Wages Data' (29 June 2018).]

It is also possible that this variation in purchasing power could be the result of yet another complexity of the real wages calculation. The number of baskets of consumables per year is directly linked to the cost of the basket. For England, Chapter 3 showed that 42.5% of the basket was made up of farinaceous goods, but this figure was as low as 35.32% in Brabant. Flanders had the highest grain consumption with 44.62% of the basket being made up of grains. Meat consumption was more heavily weighted in Brabant, and the Brabantines had 5% more industrial goods in their basket than England and Flanders.⁶⁶⁶

⁶⁶⁶ See Munro, 'Wage-Stickiness', p. 231.

With meat and industrial goods being the most expensive types of commodity, it is perhaps possible that real wages seem lower in Brabant because the Brabantine basket was filled with more luxury goods than elsewhere. Likewise, the English might have been at a disadvantage in the real wages calculations because they apparently consumed slightly more meat than the Flemish.⁶⁶⁷

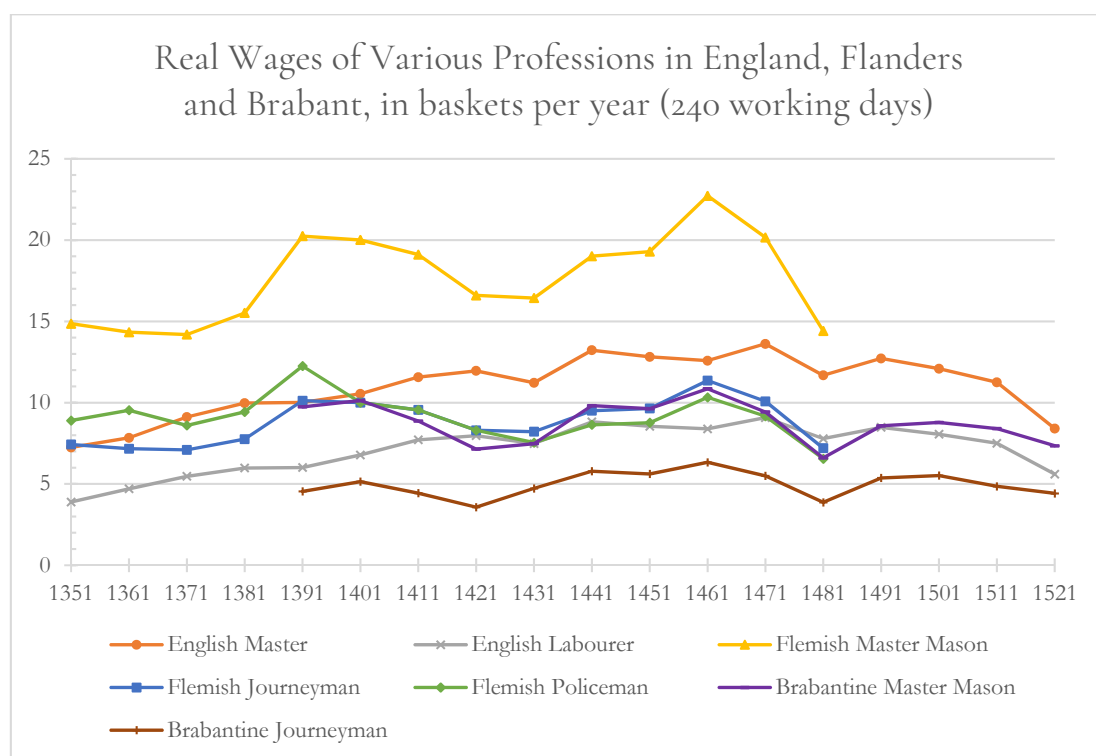


FIGURE 4.28
[Adjusted from Figure 4.27]

A perhaps somewhat rudimentary method of testing the impact of different basket weights on real wages calculations is by converting the value of the Flemish basket into

⁶⁶⁷ Indeed, Allen raises disparity in consumption patterns as an issue with real wages calculations. See R. C. Allen, 'Real Wage Rates (Historical Trends)', in Steven N. Durlauf and Lawrence E. Blume (eds), *The New Palgrave Dictionary of Economics* (London, 2008), <<https://doi.org/10.1057/978-1-349-95121-5>> (27 July 2018).

Brabantine *groots* and constructing a new series for Brabantine real wages. Given that commodity prices were also slightly cheaper in Flanders than they were in Brabant, the fact that Brabant still lags behind Flanders so significantly (though has closed the gap between master wages in England and Brabantine wages) suggests that skilled and unskilled labourers were simply less well paid in Brabant [Figure 4.29].

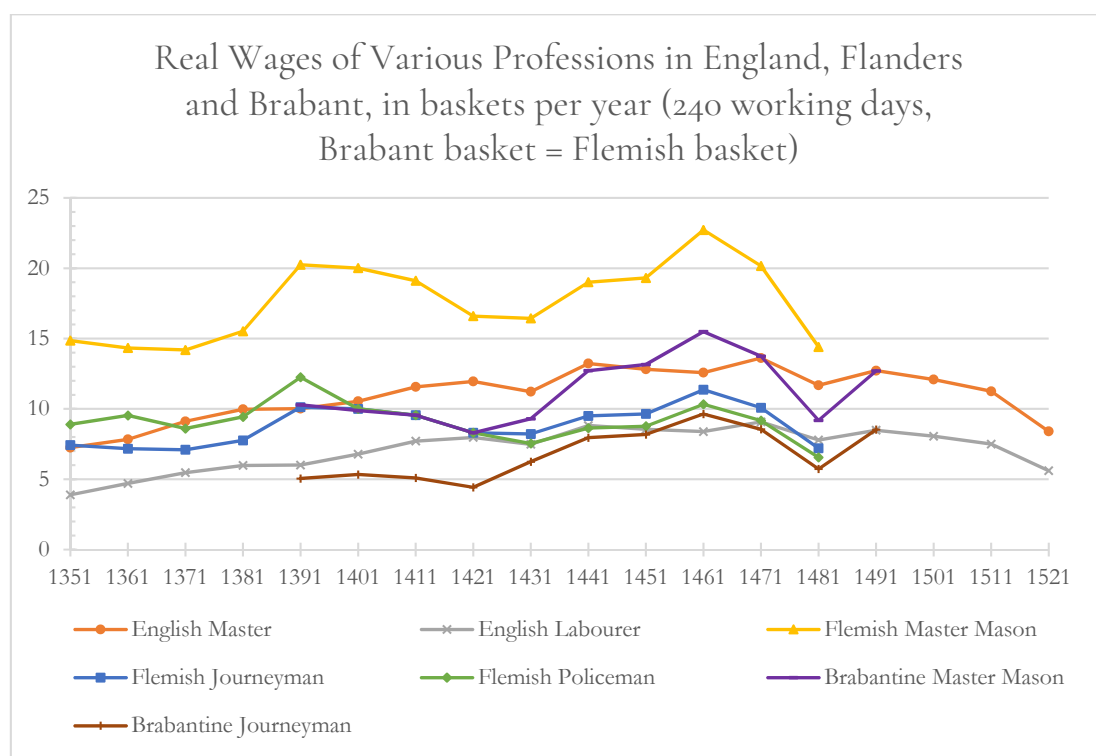


FIGURE 4.29
[Adjusted from Figure 4.28 using data from Figure 3.28]

There is one final issue with the real wages data that has been presented so far. All the adjustments made so far have helped to close the gap between the different regions, yet England still appears to have had fairly low standards of living compared to Flanders. However, it was stated above that the Flemish and Brabantine data comes from the cities, the commercial centres of the Low Countries. In contrast, Farmer, in the construction of

his wage series, excluded London wages entirely because ‘in the fifteenth century the London differential was around 50 per cent’.⁶⁶⁸ This difference between city and rural wages could have had an enormous impact on the appearance of real wages in England. Even if London commodity prices were slightly higher than elsewhere, it is unlikely that it was a significant difference because, as Adam Smith put it, ‘the wages of labour vary more from place to place than the price of provisions’.⁶⁶⁹

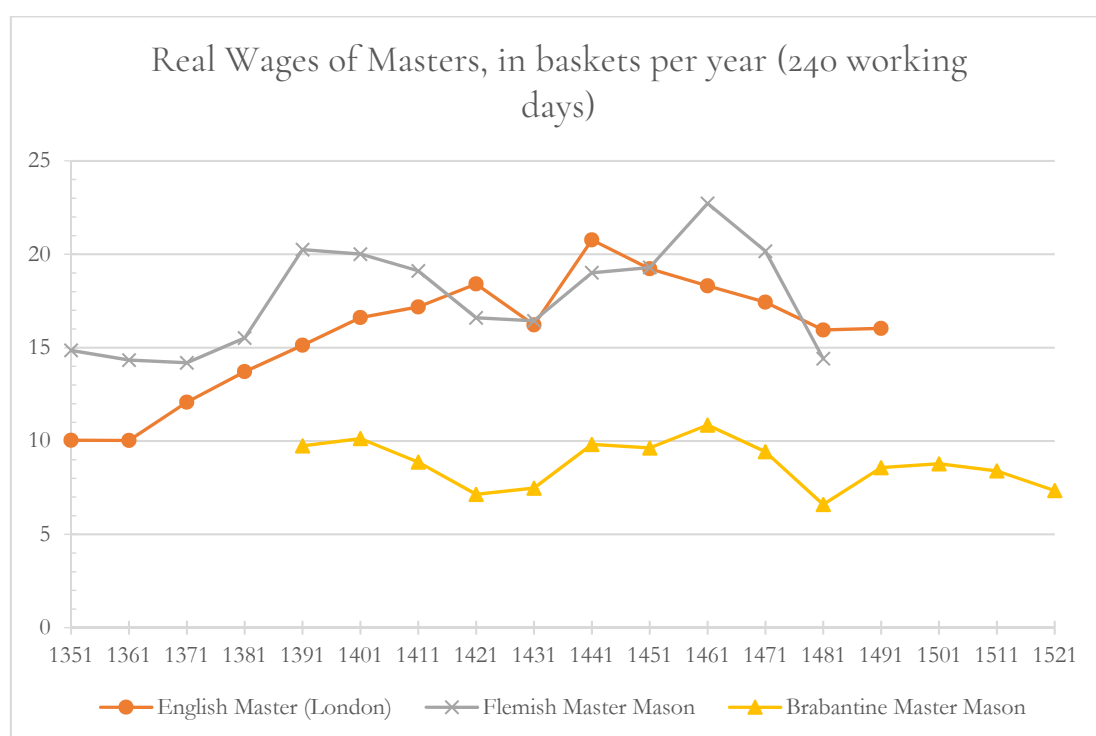


FIGURE 4.30
 [Adjusted from Figure 4.29 using Farmer, ‘Prices and Wages’, p. 475.]

By inflating the wages of English masters by the average premium on a London master wage in each decade, real wages in England are now on a par with those in Flanders [Figure 4.30]. Furthermore, in contrast to the undulating, yet not increasing, real wages of

⁶⁶⁸ Farmer, ‘Prices and Wages’, p. 497.

⁶⁶⁹ Smith, *Wealth of Nations*, p. 79.

Flemish and Brabantine masters, the London masters saw a fairly consistent increase in their real wages until the middle of the fifteenth century. Of course, while London masters were not by any means representative of the fortunes of the general English labouring population, this suggests that perhaps standards of living in England did not lag far behind those in Flanders after all. Comparing English rural wages to city wages on the Continent has hitherto produced misleading results.

The above analysis of real wages has shown that perhaps English labourers were seeing a genuine increase in their living standards. Real wages in England were on an upward march for most of the late medieval period, while in the Low Countries they undulated and slowly declined. Clearly, a lack of debasement in England allowed workers to benefit from the impact of lower population—prices deflated and a lack of labour increased wages. In Flanders and Brabant, heavy debasement caused high levels of commodity price inflation, which mostly offset gains made to wages. It is quite possible that something similar happened in Scotland, as we saw evidence of wages adjusting to debasement, but Chapter 3 showed that Scottish prices also increased rapidly too. However, it is possible that payment in kind helped to insulate workers from price inflation if the bulk of their yearly consumption was included as part of their wage.⁶⁷⁰ Thus, the cash wages very probably represented the supplementary and perhaps ‘disposable’ part of their income.

England, therefore, seems to have been unique insofar as it was the only region in this thesis to offer consistent gains in real wages.⁶⁷¹ The term ‘golden age’ has frequently been

⁶⁷⁰ Woodward, *Men at Work*, p. 1.

⁶⁷¹ Of course, these gains were only felt by wage earners. The peasant grain producers probably suffered

used to describe the period following the Black Death, when labourers made substantial gains in their standards of living. Thorold Rogers was the first to coin the term,⁶⁷² but it has been picked up by other late medieval economic historians.⁶⁷³ However, this interpretation has come under fire in recent years, most notably from Hatcher.⁶⁷⁴ He has taken issue with the notion that labourers saw substantial gains in their standards of living. His main criticism is whether day wages were representative of annual income.⁶⁷⁵ Indeed, his point is valid—if employed on short-term contracts, there was no guarantee of year-round work for a labourer, and thus the scope to benefit from pay rises was limited. Nevertheless, the study of wages set out in this chapter has offered the means to provide an alternative reading. By suggesting that (despite higher wages) living standards of labourers had not improved substantially after the Black Death, it is implied that there was an abundant amount of work available *before* the Black Death. It is rather difficult to make this argument, for if there was a greater demand for labour before the Black Death, wages would not have risen so readily after the work force was dramatically reduced by plague.

quite significantly from the fall in grain prices and (for the larger farmers) rise in wages. See Bailey, 'Demographic Decline', p. 10.

⁶⁷² Thorold Rogers, *Agriculture and Prices*, iv, p. 23.

⁶⁷³ Dyer has been one of the main advocates of such an interpretation of the post-Black Death English economy. See Dyer, *Making a Living*; Dyer, *Standards of Living*; Dyer, 'Golden Age Rediscovered'.

⁶⁷⁴ Hatcher, 'Unreal Wages'. Christine Newman has also questioned the existence of a 'golden age' by showing that wages for labour were not that high at Durham Priory. However, her work focuses on the period 1494–1519, which is when the 'golden age' was essentially over, because prices had begun to increase by this point on account of rising population and increased availability of silver (Chapter 3 discussed this in more detail). See C. M. Newman, 'Work and Wages at Durham Priory and Its Estates, 1494–1519', *Continuity and Change*, Vol. 16, No. 3 (2001), pp. 357–78.

⁶⁷⁵ Hatcher, 'Unreal Wages', pp. 6–7. He also questions whether money wages included payment in kind. However, Farmer is very clear that his wage data is deliberately constructed to ensure that workers were not paid beyond their cash allowance. See Farmer, 'Prices and Wages', p. 471.

This leaves one to wonder whether there was no less a chance of full-time employment after the Black Death than there had been before. If it can therefore be assumed that the chances of employment were equal in both periods, then a gain in the value of a day's pay should have translated into an overall gain in living standards. Finally, even if there was only half the amount of work available after the Black Death (assuming that the demand for labour halved in line with population), then a labourer could earn the same amount of money as before the Black Death but with half the labour because wages had doubled by 1400.

Of course, as Dyer points out, looking at the real wages of a single male for each household also paints a misleading picture. After the Black Death there was a greater amount of female employment, especially within craft industries like brewing.⁶⁷⁶ Though it has been argued that the annual value of female labour did not substantially increase after the Black Death,⁶⁷⁷ with more wage earners in each household family living standards should still have improved. Furthermore, Hatcher also states that after the Black Death, access to land in rural society was higher than ever before.⁶⁷⁸ This surely meant that individuals were able to supplement their cash income by growing their own food and keeping livestock.

⁶⁷⁶ Dyer, 'Golden Age Rediscovered', pp. 190–1; J. M. Bennett, *Ale, Beer and Brewsters in England: Women's Work in a Changing World, 1300–1500* (Oxford, 1996).

⁶⁷⁷ J. Humphries and J. Weisdorf, 'The Wages of Women in England, 1260–1850', *Journal of Economic History*, Vol. 75, No. 2 (2015), p. 417. The value of female casual labour did improve substantially after the Black Death, but the authors also suggest that married women were disadvantaged because they were unable to move around to benefit from higher wages elsewhere and were less likely to take up longer-term employment contracts.

⁶⁷⁸ Hatcher, 'Unreal Wages', p. 8.

4.3 CONCLUSION

This chapter has shown that England's economic situation after the Black Death was once again atypical of her trading partners. Rents, like commodity prices, declined through much of the period while wages rose. In contrast, rents in Scotland and Flanders were far more likely to be inflationary. Scotland, Flanders and Brabant all saw wage increases too, but the benefit of this was largely negated by increases in commodity prices, meaning that England was the only region studied where real wages rose for most of the late medieval period. Though there are caveats with real wages, and it is possible that English labourers might not have enjoyed quite the high increase in standards of living that has commonly been presumed, the data still gives cause for optimism. Though London real wages were high, they were on a par with those in the Flemish commercial centres. There is no reason to believe that work was any less plentiful after the Black Death, which suggests that there must have been *some* benefit to workers when their day wages increased. The greater availability of land (and its decline in value) also meant that English workers were more likely to have been able to supplement their income by growing some produce.

The findings of this chapter, combined with those from Chapter 3, further strengthen the conclusion that prices, rents and wages were more influenced by population trends in England. This was possibly the result of there being no significant debasement—the consequence of England's hard money policy—which allowed other factors to take a more prominent role in determining trends. In contrast, there has been consistent evidence to suggest that debasement was generally linked to inflation. Scotland, Flanders and Brabant all saw general upward trends in rents and wages. However, custom played a part, and

rents and wages were still prone to bouts of 'stickiness' in cases where there was an established going rate for a job, or where a landlord was rewarding a loyal tenant. We are now left with one question: how was England able to produce such atypical trends?

CHAPTER 5: CONCLUSIONS

This thesis began by presenting a number of research questions, which it has subsequently sought to address. The main aim has been to examine the extent to which England's economic experience after the Black Death was typical of Scotland, Flanders and Brabant as well. This was tested by examining how much demographic and monetary factors influenced the trends of commodity prices, wages and rents. By placing England's economy within the framework of a triple comparison, my thesis has demonstrated that England's economic experience after the Black Death was highly unusual, and contradicts much of the common narrative of economic recession found within the historiography. This conclusion has manifested itself on a number of different levels throughout the thesis.

5.1 ENGLAND AS AN OUTLIER

Chapter 2 set out the necessary data required to test the economic impact of population, debasement and mint output. It found that England's currency was unusually hard, and that debasement was only initiated every half century or so. This was almost certainly because of England's unique benefit of a consistent balance of payments surplus, aided by the wool and cloth industry. And the result of infrequent debasements was that mint output was also cyclical, peaking every fifty years. The monetary situation of England was in stark contrast with Scotland and the southern Low Countries, where debasement was frequent and mint output was erratic. Chapter 2 also demonstrated that, after the initial demographic shock of the Black Death, England's population declined throughout most of the fifteenth century, with recovery only really beginning towards the end of the century. This was also a unique feature of late medieval England, because the populations of

Flanders and Brabant appear to have begun to recover. Likewise, scanty evidence from Scotland also suggests that demographic decline was relatively short lived there as well. The consequence of England's low mint output and persistent demographic decline was that the *per capita* money stock and mint output were far more favourable than the bullion famine and mid fifteenth-century slump narratives would suggest—indeed the general availability of money per capita after the Black Death appears to have been far greater than before. In contrast, the rising population and sluggish mint output in Flanders and Brabant, combined with probable currency export resulting from a balance of payments deficit, suggested a far more vulnerable supply of money per capita which required frequent debasement to counter the issue. Thus, it was seen that the basic fundamentals of England's economy in the post-Black Death period were already different from Scotland and the southern Low Countries.

With such a differing demographic and monetary experience, it was unsurprising to find in Chapter 3 that England's commodity prices behaved differently from those of Scotland, Flanders and Brabant. English prices were unusually flat, or even deflationary. Though there appears to have been a good per capita supply of money in England, there is sufficient evidence to suggest that England suffered from a shortage of small change in the late fourteenth and fifteenth centuries. This small change shortage was the result of the English resistance to debasement, and it probably exacerbated some of the price depression caused by sluggish population recovery after the Black Death. In contrast, prices in Scotland, Flanders and Brabant were prone to long periods of inflation which coincided with policies of frequent and aggressive debasement, but also faster demographic

recovery after the Black Death. There was also evidence of price decline in the southern Low Countries during the bullion famine, and further decline in the middle of the fifteenth century. Scottish prices were also prone to decline in the mid fifteenth century, but this was less common in England. Chapter 4 found that England's rent and wage trends were also atypical when put in the context of the Scottish, Flemish and Brabantine experiences. Rent levels in England tended to decline for most of the post-Black Death period. Deflation was particularly clear in the middle of the fifteenth century—perhaps indicative of an economic slump—though there was less clear evidence of a bullion famine at the end of the fourteenth century. In contrast, there was a much clearer inclination towards inflation for Scottish and Flemish rents. However, the results were nuanced by the importance of manorial custom, which meant that tenants who had been loyal to the landlord were more likely to be rewarded with longer-term rent agreements or were immune from rent hikes. As for English wages, in contrast to rents and prices, they had a tendency to rise throughout the post-Black Death period. The rise was particularly evident for unskilled labourers, as has been argued in much of the historiography.⁶⁷⁹ In Flanders and Brabant, on the other hand, wages were generally prone to inflation, especially during periods of high debasement and mint output activity. But in times when there was less monetary alteration, wages tended to become 'sticky'. This was evident in the middle of the fifteenth century, in strong contrast to the decline seen in commodity prices during

⁶⁷⁹ Most notably, see Dyer, *Standards of Living*, p. 216; Farmer, 'Prices and Wages', pp. 478–9; Campbell, *English Seigniorial Agriculture*, p. 9; Woodward, *Men at Work*, p. 192.

the same period. Almost certainly, as Munro has argued, there was a ‘downward stickiness’ of wages.⁶⁸⁰ Furthermore, the wages of skilled and unskilled workers were more highly correlated in Flanders and Brabant than in England, which suggests that wages inflated in tandem in the Low Countries. In Scotland, unlike commodity price trends, the scanty wage data was found not to have generally been prone to inflation—many of the wages paid at Coupar Angus showed little adjustment to reflect the debasement of the Scottish currency. Likewise, from 1440 to 1464, the Porters of Bute Castle were never given a pay increase over their annual fee of 32s. and a chaldron of oatmeal. However, there was still evidence that adjustments were made to take account of the decline in the Scottish currency’s value. Masons working for the Scottish Crown in the early sixteenth century were paid a wage reflective of the current English rate, when considered in terms of their pure silver value. Finally, it was highlighted that England was the only country in this thesis to have benefited from a steady rise in real wages in the post-Black Death period. The unique combination of rising wages and falling prices (and rents) meant that the purchasing power of a year’s labour increased throughout most of the period, with decline occurring only from the second half of the fifteenth century. In contrast, real wages increased with less consistency in Flanders and Brabant, with periods of decline in the first half of the fifteenth century, and from the 1460s to the end of the century. Thus, it became clear in Chapters 3 and 4 that England’s prices and rents were unusually stagnant or deflationary, while English wages were more inflationary than elsewhere.

⁶⁸⁰ Munro, ‘Wage-Stickiness’, pp. 186, 207.

The unusual nature of England's post-Black Death price, wage and rent trends became apparent only through my employment of a triple comparison. The inclusion of Scotland has built on the work of Munro, whose research on the post-Black Death economies of England, Flanders and Brabant presented a strong insight into the impact of monetary factors on prices and wages in these countries.⁶⁸¹ However, by including more than two economies in my study, it has become far more straightforward to ascertain what can be considered a 'normal' economic experience in the western North Sea area after the Black Death, and what can be considered an anomaly.

5.2 THE IMPACT OF DEMOGRAPHIC, MONETARY, AND ENVIRONMENTAL FACTORS

My thesis employed statistical methods in order to test the demographic and monetary forces behind these interesting price, rent and wage trends. Long-term price trends were examined through the use of regression analysis. By quantifying the relationship between population, debasement and mint output, my work has offered a more precise approach to the study of the demographic and monetary theories than the majority of works on the subject. Munro has also employed regression analysis in his comparative research on prices in England, Flanders and Brabant,⁶⁸² but my thesis's more balanced approach to price determination further sets it apart. By considering England's economy in the context of Scotland and the southern Low Countries, and taking a systematic approach to

⁶⁸¹ The most comparative of his works are: Munro, 'Mint Outputs, Money, and Prices'; Munro, 'Urban Wage Structures'; Munro, 'Symbiosis of Towns and Textiles'; Munro, 'Wage-Stickiness'; Munro, 'Builders' Wages'.

⁶⁸² Munro, 'Mint Outputs, Money, and Prices'.

the question of demographic and monetary drivers, it has become possible to evaluate the relative significance of each theory. My construction of Flemish and Brabantine population data in Chapter 2 has enabled me to consider the long-term role of population on price trends in a way that Munro and other monetary historians previously have not. My findings were that in the case of many commodity price trends, population trends explained the greatest percentage of general price movements in England, whereas the impact of population on long-term price trends in Flanders and Brabant appears to have been far more limited. The role of population has also been shown to have been an important determinant of rent and wage trends, though other factors were still crucial. For Flanders, population was positively correlated with rent levels, though the r^2 's weakness suggested that the effect of population was fairly minimal. Wage trends in Flanders were again positively correlated with population levels, and a strong r^2 (0.4512) leads to the conclusion that population was a very clear determinant of wage levels. However, though the positive relationship between population and wages was repeated in Brabant, the r^2 was far weaker.⁶⁸³

Whereas population was often the key independent variable for England, it is clear that debasement was the main driver of general price trends in Flanders, Brabant and Scotland. The regression analysis showed that the same was also true of rents and wages in Flanders and Brabant. The impression gained from the sporadic rent and wage data in

⁶⁸³ See Figure 4.24.2.

Scotland also suggests that there was some link between debasement of the Scottish currency and rises in rents and wages. However, though population was the main driver behind English price fluctuations, debasement can still be seen to have played a role in some English commodity price trends—this was especially apparent in the prices of heavily traded commodities, like cloth and wine.⁶⁸⁴ Likewise, debasement was the most important determinant of English rent levels.⁶⁸⁵ Debasement also explains slightly more of the English wage trends than population, though this might well have been a spurious relationship given the findings in the regression analysis of prices and rents.⁶⁸⁶ Notably, it was *almost* always the case—in England, Scotland, Flanders and Brabant—that the debasement of the silver currency was much more prone to causing inflation than when the gold currency was debased. This has given further weight to the argument put forward by Casson and Casson that silver was more inflationary than gold.⁶⁸⁷

In addition, my regression analysis used mint output as an independent variable, in an attempt to construct some means of gauging the relevance of Quantity Theory for medieval prices, wages and rents. By constructing annualised Scottish mint output data for the late medieval period in Chapter 2, I was able to incorporate Scotland into this examination of Quantity Theory, taking it beyond the scope of other studies of the post-Black Death Scottish economy. Of course, it has repeatedly been emphasised that mint output can only ever offer a flawed means to testing Quantity Theory, for it takes no

⁶⁸⁴ See Section 3.2.2.

⁶⁸⁵ See Figure 4.11.2.

⁶⁸⁶ See Figure 4.24.2.

⁶⁸⁷ Casson and Casson, 'Modelling the Medieval Economy', p. 65.

allowance of either currency accumulation or wastage/loss. It is also necessary to remember that the Fisher Identity ($MV=PT$), the foundation for Quantity Theory, makes no distinction between gold and silver currencies, or denomination size. This is problematic because this thesis has furthered the conclusion that gold and silver served different roles in the medieval economy, and thus impacted price levels differently. Yet in the absence of money stock estimates for Scotland, Flanders and Brabant, I have been obliged to rely upon mint output—a combined total for gold and silver—as a measure of monetary forces.

It was found that mint output often played a ‘background’ role in English price and rent levels. This was confirmed by the findings from the English basket of consumables, where the size of both the money stock and the mint output played a minor—yet statistically significant—role in the general price level.⁶⁸⁸ However, the persistent appearance of a negative coefficient for English wages casts doubt on the ability of mint output to override the effect of a workforce deficit. For Scotland, the evidence of mint output driving prices was difficult to discern. This was on account of the negative coefficient that commonly arose from the regression analysis—a symptom of patchy data, or an indication of a genuine peculiarity where a declining mint output could be related to rising prices. In Flanders and Brabant, the role of mint output on the general price level was also somewhat difficult to determine. Mint output had a fairly consistent, positive and statistically significant relationship with prices in Brabant, though the same was not true

⁶⁸⁸ See Figure 3.29.

of Flanders; Flemish prices were commonly negatively correlated with mint output. The impact of mint output on Flemish rents was also inconsistent. There was a positive coefficient for the rents of the sandy land, but a negative coefficient for coastal land. However, in both cases the results lacked statistical significance.⁶⁸⁹ As was the case for commodity prices, there was a negative relationship between mint outputs and wage rates in Flanders, whereas the relationship was positive in Brabant.⁶⁹⁰ It is evident that the role of mint output as a cause of inflation and deflation was minor, but generally important—especially in England and Flanders. Yet the lack of denominational and metallic separation of the mint output potentially masks the importance of the different coins in circulation and their ability to trigger inflation/deflation. It was suggested that England might have suffered from a chronic shortage of small change, an issue which was not as problematic for Scotland and the Low Countries due to their very different approaches to debasement. Thus, while it appears that the role of Quantity Theory on long-term English prices, wages and rents is a fairly minor one, we cannot dismiss the notion that a future compartmentalisation of the money stock by denomination might reveal the impact of Quantity Theory to have been more substantial than this thesis has suggested.

The final factor to have been included in the regression analysis of long-term price trends was crop yields. By its nature, this independent variable could only be applied to the price trends of farinaceous goods. It was found that crop yields were not overly important determinants of long-term price trends when the grains were robust. On the

⁶⁸⁹ See Figure 4.11.3.

⁶⁹⁰ See Figure 4.24.1.

other hand, crop yields were a strong driver of prices when the grain was particularly difficult to grow, or vulnerable to poor weather. Thus, wheat prices were the most influenced by crop yields. Yet the results were nuanced by the measurement of volatility. It was shown that inelastic demand could be responsible for greater crop price volatility even if the crop yield was more stable. This was found to be the case for oats in Scotland, which had the most volatile of all grain prices, despite being the most robust of all crops.

The use of regression analysis in this thesis has provided the most comprehensive test of the vulnerability of long-term prices, wages and rents to demographic, monetary and environmental factors. However, it has also been stressed that there is much that these factors cannot account for. Politics, trade disputes and civil conflict could have caused various shocks to prices, wages and rents in the short to medium term. These unquantifiable variables could have been highly significant in the short term, especially when they involved the disruption of supply links. It was also emphasised that there were a great deal of fluctuations—particularly in prices—that we cannot explain. Despite those limitations, these findings are highly significant for economic historians of the late medieval period. It has become very clear that England's long-term price, wage and rent trends were heavily influenced by the slow demographic recovery after the Black Death, yet debasement was highly important for long-term trends in Scotland and the southern Low Countries. However, while this means we cannot ignore the importance of the demographic theory, it must be acknowledged that money remained a fundamental determinant of economic performance in the medieval period. Indeed, it is highly probable that population levels were only the main long-term driver of trends in England *because* its

positive balance of payments allowed England to operate with a policy of minimal debasement. In countries where debasement was more common, it seems to have played a far clearer role in long-term price, wage and rent trends. This finding becomes clear only through the systematic comparison of England's economy with those of its neighbours.

5.3 IMPLICATIONS

This thesis has found that England's economic experience after the Black Death was unusual when it was placed in the context of a triple comparison with Scotland and the southern Low Countries. By setting England's monetary and demographic situations in the wider context of Scotland and the southern Low Countries, this thesis has also demonstrated that neither the demographic nor the monetary theories can entirely account for all price, rent and wage movements. It was seen that demographic shocks were perfectly capable of producing short-term price fluctuations in all regions studied in this thesis. However, the strength of demographic factors as a determinant of long-term price, rent and wage trends was unique to England. In contrast, debasement had a far stronger and consistent effect on prices, wages and rents in Scotland and the southern Low Countries. The importance of mint output was also keenly felt for Brabantine prices and wages. This is not to say that debasement and Quantity Theory played no role in English price, wage and rent trends—the quantity and quality of money was clearly present in the background. Clearly then, it must be accepted that neither the demographic nor the monetary theory can fully account for price, rent and wage fluctuations in England, Scotland, Flanders and Brabant. We must therefore champion the modern approach of balance, employing a paradigm where demographic, monetary, environmental and political factors

are all given fair consideration as viable determinants of late medieval prices, wages and rents.⁶⁹¹

Furthermore, we must consider that England's long-term price, wage and rent trends were more keenly driven by demographic factors because the stability of the currency enabled population to play a greater role in the determination of these trends than would otherwise have been possible. This has been further evidenced by the primacy of monetary factors in Scotland, Flanders and Brabant, where debasement was undertaken on a frequent and aggressive basis, and where demographic factors were less evident as economic forces.

This finding is crucial to the study of late medieval England because it enables us to perform a recalibration of our understanding of the narrative of the post-Black Death English economy. Such a recalibration is particularly necessary for our interpretation of the two main monetary crisis periods in post-Black Death England: those of the bullion famine and the mid fifteenth-century 'slump'.

It is difficult to deny that there were some monetary issues ailing England around the period of the bullion famine (c.1395–1415), but this thesis has shown that the bullion famine may have affected England less severely than her trading partners. Mint output was low in this period, yet this output slump still fell within the cyclical nature of English *per capita* mint output, calling into question whether the decline was actually extraordinary. Furthermore, the *per capita* money stock and mint output per capita calculations have

⁶⁹¹ For the discussion of the economic historians who have taken a more balanced approach, see above, p. 19.

suggested that the *overall* (i.e. combined gold and silver of all denominations) supply of money per head in England was not so dire during this period. This was further evidenced in Chapter 3, which showed that English prices were not prone to severe deflation during the bullion famine period, unlike elsewhere.

It is true that a great deal of contemporary evidence speaks of particular coinage shortages in England around the time of the bullion famine, but this was not because of a general crisis in the money supply. The numerous petitions to parliament regarding the shortage of small change in the late fourteenth and early fifteenth centuries—and the problem with the import of small change from Scotland and the Continent—suggest that England was a country with a shortage of petty coinage. Scotland and the southern Low Countries debased their currencies in this period, presumably as a means of countering the increasing scarcity of silver. The lack of debasement in England to counter this apparent growing deficit of small change remains puzzling. Indeed, as Day remarked, it appears that ‘only England, for reasons unknown, seems to have learned to live with a chronic scarcity of cash in the famine years without recourse to surrogate “black money” whether foreign or domestic’.⁶⁹²

But we can suggest reasons for this posture. England’s resistance to debasement during the bullion famine was a peculiar quirk of its economic situation after the Black Death. It is highly probable that, even during the bullion famine, parliament did not feel particularly moved to break the proportional relationship between petty coins and larger

⁶⁹² Day, ‘Bullion Famine’, p. 46.

silver denominations for a number of reasons. First, the *per capita* supply of money was almost certainly adequate. This was most probably the result of England constantly running a balance of payments surplus,⁶⁹³ which ensured a steady supply of foreign bullion to the English mints. Though Chapter 2 showed that the bimetallic ratio in England was normally relatively pro-gold, this still meant that the overall value of money in circulation remained relatively buoyant, with gold presumably having the effect of freeing up silver for low-level domestic transactions. Consequently, it is possible that England's relatively strong trade position cushioned it from many of the effects of the bullion famine, whereas her trading partners were far more vulnerable to money shortages. If the general supply of currency remained adequate, there was little incentive for England to initiate any dramatic corrective measures. Indeed, by c.1400 there had been enough instances of England's neighbours undertaking dramatic debasement—with the subsequent unpopular inflation—for the English parliament to be wary of initiating a debasement when it might not have been absolutely necessary.⁶⁹⁴ Second, not only was small change more expensive for the mint to produce, it was also not in the interest of merchants visiting the mints to convert their foreign bullion into petty coin. Small change was inconvenient and made the transportation of bullion relatively more expensive than it would have been when using larger denominations. Let us consider two fictional silver coins. Coin A has a diameter of 1cm, and thus a radius of 0.5cm. Coin B has a diameter of 2cm and a radius of 1cm. I will presume both had a thickness of 0.08cm (0.8mm). It is then possible to work

⁶⁹³ Even in the face of the falling demand for English wool as the Flemish cloth industry collapsed.

⁶⁹⁴ This was seen particularly clearly in the southern Low Countries in Chapter 3.

out the volume of silver that each coin can hold by using the formula:

$$h \times \pi r^2$$

Coin A can thus hold 0.063cm³ of silver, while Coin B can hold 0.25cm³. Given that a coin of double the radius can hold four times as much silver, less space is taken up per unit of silver if larger denominations are used. Therefore, the cost of transportation and shipment is lower for larger denominations. By lowering the cost of carriage, merchants could benefit from smaller swings in exchange rates. If they had been forced to use smaller denominations, they would have needed to transport a far greater volume of currency, which would have been costly, eating into exchange-rate profits. Thus, between the high cost for the mints and the inconvenience for merchants, there was a double disincentive to produce small change.

It is thus highly probable that while England was not affected by the bullion famine to the same extent as her trading partners, the country did suffer from a chronic shortage of small change in this period. Ironically, the balance of payments surplus and the apparent commitment to maintain intrinsic proportionality between the denominations made it difficult to rectify this issue. A debasement that maintained the proportions of the denominations would, in the instance of ample *per capita* money stock, increase the availability of money per head, which could in turn have triggered an unpopular bout of inflation.⁶⁹⁵ Though a small amount of inflation can be desirable for an economy—because

⁶⁹⁵ Thus, because we have seen that changes in the weight of silver coins were more likely to cause inflation than changes to the gold currency, the lack of inflation following English debasements further suggests that the quantity of silver output—and therefore small change—was not overly high.

it acts as a safety net to encourage investment and growth—and hence some debasement could be healthy for a medieval economy,⁶⁹⁶ it is possible that the adverse effects of debasement posed too high a risk for England to justify a change in its monetary policy. Furthermore, because the intrinsic proportionality between the denominations was maintained, it was expensive for the mint to produce small change, and merchants were not offered sufficient profit for receiving them from the mint to offset the inconvenience that small change posed to their business.

Turning to the so-called Great Slump of the mid fifteenth century, there is certainly some clear evidence of a decline in England's economic fortunes at that time—relative to more prosperous decades like the 1370s.⁶⁹⁷ As was the case with the bullion famine, the English mint output was low in the mid fifteenth century. As Hatcher has argued, this might have been caused by a falling balance of payments, which appears to have reached its nadir in this period.⁶⁹⁸ Furthermore, it has been seen that the small change issue persisted into the middle of the fifteenth century, exacerbating any general shortage of money.⁶⁹⁹ Consequently, it was unsurprising to see that some commodities showed a price decline around the 1440s.⁷⁰⁰ This was also the case for some of the rent data.⁷⁰¹

However, this decline is put into context when the English economy is compared with those of the southern Low Countries and Scotland. It was fairly common for Scottish

⁶⁹⁶ Gemmill and Mayhew, *Changing Values*, pp. 378–80.

⁶⁹⁷ See Hatcher, 'Great Slump'.

⁶⁹⁸ *Ibid.*, pp. 241–4.

⁶⁹⁹ See p. 190.

⁷⁰⁰ This was particularly evident for barley, wheat, herring (though the decline was in the 1430s), cheese and wool (but the decline was slightly later, in the 1450s) prices. See Figures 3.1, 3.2, 3.5, 3.7 and 3.11.

⁷⁰¹ See Figure 4.17.

prices to decline in the middle of the fifteenth century, and the issuing of black money by James III may point to a general shortage of small change. Combined with the likelihood that Scotland was running a balance of payments deficit, there is thus reasonable evidence to suggest that there was also an economic slump in Scotland in the middle of the fifteenth century. Evidence from the southern Low Countries' economic experience in the middle of the fifteenth century puts England's 'slump' into shocking perspective. While the English mint output simply dwindled during this period, the Flemish and Brabantine mints ceased output *almost entirely* from Philip the Good's monetary unification (1433) until the resumption of debasement in the 1460s. During this time, almost all commodity prices in Flanders and Brabant declined dramatically, with the trend being reversed only when debasement was initiated.⁷⁰² Rents also declined in tandem with commodity prices.⁷⁰³ Wages were not as susceptible to downward adjustment, even in periods of declining prices.⁷⁰⁴ Thus, during the middle of the fifteenth century, wages in the southern Low Countries stopped the inflationary march of the previous period, and froze at their 1440s level.⁷⁰⁵

The evidence from the Low Countries in the middle of the fifteenth century is extremely revealing. By cancelling the policy of low-level and frequent debasement, Philip the Good emulated England's policy of monetary stability. Yet, this policy triggered a full-

⁷⁰² See Chapter 3.

⁷⁰³ See Figure 4.7.

⁷⁰⁴ This was called the 'ratchet effect' by Phelps Brown and Hopkins, and 'downward stickiness' by Munro, which meant that wages were less prone to decline than prices and rents. Phelps Brown and Hopkins, 'Seven Centuries', p. 202; Munro, 'Wage-Stickiness', pp. 186, 207.

⁷⁰⁵ See Figures 4.20 and 4.21.

blown recession in the Low Countries, whereas monetary stability in the middle of the fifteenth century had no dramatic adverse effect on England. This suggests that England's economic position was unique: its money supply remained highly stable without the need to constantly and actively attract bullion to the mints. The repercussions of this policy manifested themselves in the form of relatively mild price stagnation and deflation. It is most likely that England's persistently positive balance of payments put the country in its unique position of monetary stability. But for the Low Countries (and Scotland), the constant struggle with a negative balance of payments necessitated continuous debasement to maintain the money stock and entice a steady supply of bullion to the mints.

Chapter 1 emphasised that the historiography of late medieval England has remained conflicted on the true extent of the decline or prosperity felt after the Black Death. This thesis has found that while there is some truth in the existence of the bullion famine and the Great Slump in the English economy, they really stand out as crisis periods only when England's economy is compared with itself, that is to say when these periods are compared with more extreme examples of prosperity, such as the 1370s. Yet when England is compared with her trading partners, the impact of these crisis periods appears dwarfed by what we have seen in Scotland, Flanders and Brabant. The historiography of the bullion famine and the Great Slump emphasise that a lack of money was the crux of the problem. Relatively speaking, though England clearly suffered from some monetary troubles (notably a lack of small change), these were paltry in comparison with the problems facing Scotland and the southern Low Countries. It is only by freeing England from Anglocentrism and instead placing it within the wider picture of its trading partners that

the true, and unusual, nature of England's post-Black Death economy becomes clear.

5.4 FUTURE WORK

This thesis has examined the impact of monetary, demographic, environmental and political factors on price, wages and rents. It did so by employing a unique triple comparison and by a more complete use of statistical methods than those seen in other similar studies which was enabled by new population data for the Low Countries and new mint output data for Scotland. There is still plenty of scope for future research to further test the conclusions offered in the present thesis. Due to time constraints, I have not sought to properly address the differing roles of credit in each economy, nor have I attempted to offer calculations or comparisons of GDP. Both of these could be included in future research with the effect of providing an even more rounded approach to the comparison of late medieval economies.

However, the most obvious next step is to widen the comparative element further still. I stressed in Chapter 1 that this thesis relied heavily on the data of the southern parts of England and the Low Countries, and the eastern part of Scotland, because this is where there is the greatest data availability, and because the time-restricted nature of a doctorate prevented me from building entirely new datasets for each region of each country. However, it is likely that there was some variation between prices, and presumably rents and wages, on a regional level. Though the aim of this thesis has been to compare the most widely available sources of prices for each country, which inevitably leads to a bias towards the southern/eastern regions of each country, it is still possible to briefly provide

an example of regional price variation by examining the difference in grain prices between Durham and the south of England. The work of Gemmill and Mayhew has shown that there was some variation in *absolute* prices of commodities, where they found that prices in Durham tended to fall between the prices seen in Scotland and the south of England in the period prior to 1367. They suggest that regional variation was the result of differing farming and trade patterns. Likewise, they suggest that there was probably regional variation of prices in Scotland too.⁷⁰⁶ Figures 5.1, 5.2 and 5.3 give comparisons for the prices of wheat, barley and oats in pence per quarter.⁷⁰⁷ The included correlation calculations demonstrate that, in all three cases, there was a moderately positive relationship between prices in Durham and prices in the south of England. Regional price variations were most likely to have been due to factors such as whether the area produced a particular commodity, or whether it had to be imported from elsewhere.

Thus, while the conclusions of this thesis are presented as overarching impressions of the economies of England, Scotland, Flanders and Brabant, further work is needed to test the extent to which the conclusions can be applied to areas beyond the southern/eastern regions.

⁷⁰⁶ Gemmill and Mayhew, *Changing Values*, pp. 13, 147, 148, 163, 181, 190, 235, 251, 259, 268, 280, 286, 292, 300, 305, 320, 326, 333, 346.

⁷⁰⁷ For the data after 1367, I have opted to use Dodds and Schofield's average prices, rather than the fictitious purchase prices. See Gemmill, Dodds and Schofield, 'Durham Grain Prices', pp. 307–27. While the authors note that there is perhaps greater truth behind the fictitious prices (p. 320), there are far fewer data points for fictitious prices and thus it would be more difficult to statistically measure the link between Durham prices and southern English prices. Furthermore, the deviations between the fictitious prices and the average prices appear to be, in most cases, extremely small.

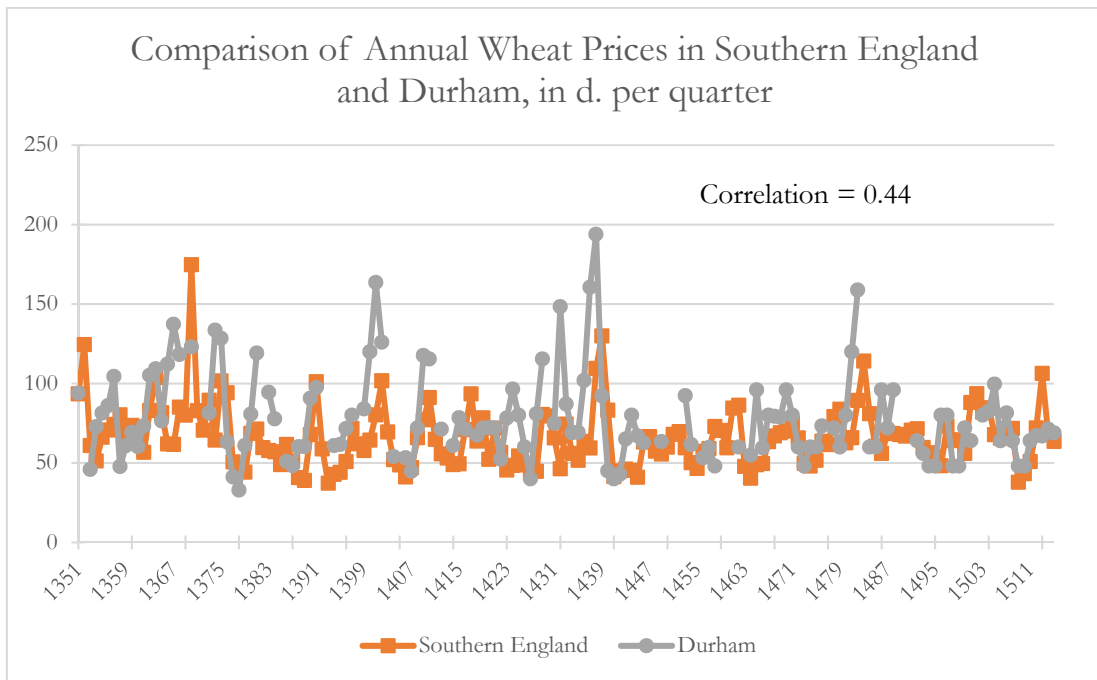


FIGURE 5.1

[Clark, 'Price History', pp. 41–123; Gemmill, Dodds and Schofield, 'Durham Grain Prices', pp. 315–25.]

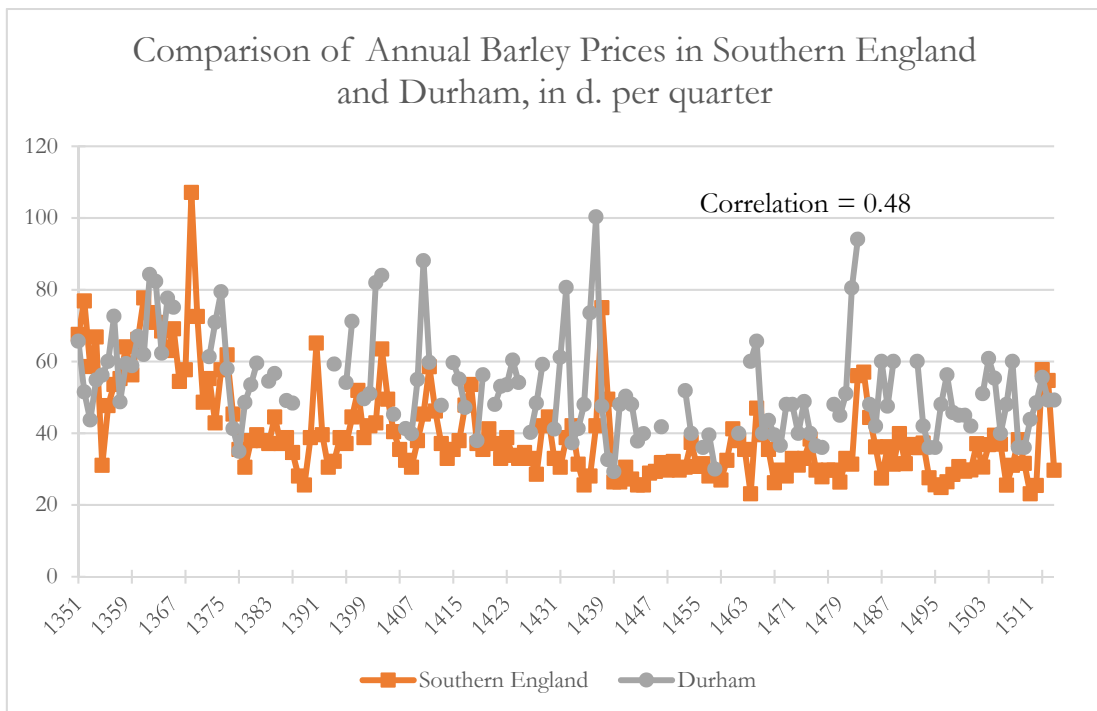


FIGURE 5.2

[Clark, 'Price History', pp. 41–123; Gemmill, Dodds and Schofield, 'Durham Grain Prices', pp. 315–25.]

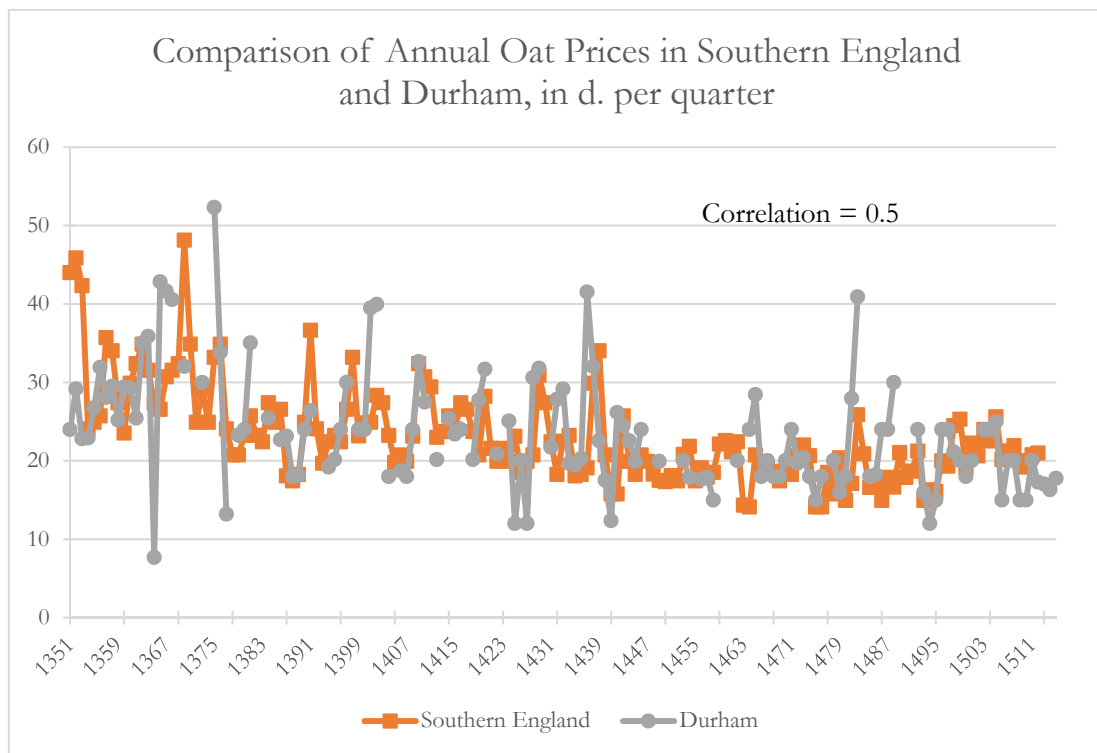


FIGURE 5.3

[Clark, 'Price History', pp. 41–123; Gemmill, Dodds and Schofield, 'Durham Grain Prices', pp. 315–25.]

In terms of expansion of the comparison to include additional countries, France would be the most natural inclusion. Though the French currency was debased heavily in the first half of the fourteenth century, the change to a policy of greater monetary stability (with the main landmarks in 1343, 1353 and 1360) made its money policy less extreme than those of Scotland and the southern Low Countries.⁷⁰⁸ Indeed, Figure 2.3 showed that, despite the resumption of debasement in the 1400s, the French silver currency maintained its value far more effectively than those of Scotland and Flanders. Including France in the comparison would have the effect of broadening the scope of the studies already carried

⁷⁰⁸ Spufford and Wilkinson, *Handbook*, pp. 177–8.

out by Miskimin.⁷⁰⁹ There could also be merit in stepping outside Europe. In the countries included in this thesis, the government issued their own currencies and made their own monetary policies. In Japan, from the twelfth to the seventeenth century, the coinage used was imported from China. This copper coinage came to Japan through trade (and piracy).⁷¹⁰ To what extent did a lack of control over the currency affect the movements of prices? It is only by continuing to widen the comparative element and make use of statistical methods that we will truly be able to ascertain just how unusual the experience of England's economy in the post-Black Death period really was.

⁷⁰⁹ Miskimin, *Money, Prices and Foreign Exchange*; H. Miskimin, *Money and Power in Fifteenth-Century France* (London, 1984).

⁷¹⁰ E. Sakurai, 'Currency and Credit in Medieval Japan', *International Journal of Asian Studies*, Vol. 5, No. 1 (2008), pp. 53–70.

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