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The Dual Crises of the Late-Medieval Florentine Cloth Industry, c. 1320 - c. 1420

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Abstract

During the hundred-year period from about 1320 to about 1420, the Florentine woollen cloth industry underwent two closely connected crises. The first crisis was the consequence, direct and indirect, of the ravages of warfare and falling population, afflicting the entire Mediterranean basin and western Europe from the 1290s, which raised transportation and other transaction costs to such an extent that long-distance trade in cheaper textiles became unprofitable, thereby forcing West European cloth producers to reorient their export-oriented production to very high priced luxury woollens (and silks) and also to shift from being price-takers to price-makers. Initially, the first crisis seemed to have had beneficial consequences for Florence: for its luxury woollens industry soon became late-medieval Italy's single most important export-oriented manufacturing industry, with large spill-over benefits for Italian commerce, banking, and finance. Indeed, by the third quarter of the 14th century, the Florentine woollen industry (*Arte della Lana*) was rivalling and then surpassing the previously pre-eminent leaders - those in the southern Low Countries (Flanders and Brabant); and in Mediterranean markets of this era, Florentine woollens reigned supreme over all rival textiles.

But the consequences of that first economic crisis, in the ensuing transformation of the Florentine cloth industry, contained the very seeds that spawned the second and far more major crisis, which led to the inexorable downfall of this once majestic industry, by the early 15th century. The chief factors in that decline were: the accelerating population decline (especially after the Black Death), further raising transaction costs; the reorientation to very narrow luxury markets, with very restricted demand; and especially the complete dependence on imported, tax-burdened English wools (as the prime determinant of both luxury quality and the very high prices of Florentine woollens). All of these adverse factors led to drastic reductions in Florentine cloth production: from about 75,000 *bolts* in the 1330s to only about 9,500 in the 1420s – an overall fall of 87% (far more than the decline in the Florentine industry's labour supply, or the European population). The Florentine cloth industry never regained its former if transitory glory. How the industry did, however, manage to achieve some recovery in the later 15th and 16th centuries, by resorting to domestic and then Spanish wools, is beyond the scope of this study.

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Introduction

During the hundred-year period from about 1320 to about 1420, the Florentine woollen cloth industry underwent two closely connected crises.[1] Initially, the first crisis seemed to have had beneficial consequences: for this cloth industry soon became late-medieval Italy's single most important export-oriented manufacturing industry, with large spill-over benefits for Italian commerce, banking, and finance. Indeed, by the third quarter of the fourteenth century, the Florentine cloth industry was rivalling the previously pre-eminent leaders - those in the southern Low Countries (Flanders and Brabant); and in Mediterranean markets of this era, Florentine woollens reigned supreme over all rivals. But the consequences of that first economic crisis, in the ensuing transformation of the Florentine cloth industry, contained the very seeds that spawned the second and far more major crisis, which led to the inexorable downfall of this once majestic industry, by the early fifteenth century.

The Florentine cloth industries and their markets: before and up to c. 1320

The Arte della Lana

Florence, in the thirteenth and early fourteenth centuries, had two merchant-dominated guilds devoted to the production and sale of wool-based textiles. The larger but much less important of the two was the *Arte della Lana*. Its constituent members were known as *lanaiuoli:* merchants (organized as family firms or small partnerships) who secured the raw materials, organized and contracted out the cloth production through variants of a putting-out system, and then arranged the marketing of the finished cloths.[2] Though some *lanaiuoli* of this earlier era evidently did manufacture a very few luxury-quality woollens, comparable to the Flemish, the importance of the *Arte della Lana* as a whole then rested on the production and marketing of a

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[1] This study is based to a considerable extent, though by no means entirely, on two of my earlier publications: Munro 2007, 105-141; and Munro, 2012a, 45 - 207. The editors of both have given their permission for the publication of this current study. Any differences between this new publication and the two previous ones are to be decided in favour of the current one (i.e., in correcting previous but minor errors).

[2] The most important study is Hoshino1980. See also Agnoletti 1940; Franceschi 1993; Dini 1990, 321-59.

very wide variety of relatively cheap, coarse fabrics, most of which were not qualitatively different from those of other rival manufacturers, in either northern or southern Europe. That wide range of production included not only cheaper woollens, but even more so of much lighter and generally also much less expensive fabrics known to English historians as worsteds and hybrid serges (the latter, composed of worsted warps and woollen wefts).[3] The most prominent type of these relatively coarser, lighter, and cheap textiles marketed in the Mediterranean basin during the twelfth and thirteenth centuries were known generically as *sayes* or *says* produced in both northern and southern Europe, by both the worsted and serge branches of the cloth industry, though predominantly by the latter. In Italy, these lower-grade textiles were woven from a wide variety of local, regional wools, most of which were coarse and mediocre in quality, which came from Italy itself, North Africa, the Balearic Islands, and southern France, especially Provence. Such Italian cloths – chiefly from Tuscany and Lombardy – were marketed under a wide variety of names, without specific regional designations, as, for example: *saia, saia cotonata, stametto, trafilato, tritana, taccolino*, etc.

The Mediterranean markets for textiles, c. 1160 - c. 1220

Nevertheless, the Italians accounted for only a small proportion of the cheaper and lighter textiles sold in the far-flung Mediterranean markets. The predominant producers of those cloths were instead those located in northern Europe: especially northwestern France, the southern Low Countries, and England. In the later twelfth century, according to Hilmar Krueger's detailed analysis of the Genoese textile trade with Constantinople, Syria, and Egypt, the most important textiles in that Mediterranean commerce were Flemish and northern French says and serges (*saie, sargie, sagie*) followed by English *stanfortes* [stamforts] and similar cheap English textiles.[4] In their respective articles on the Mediterranean trade in textiles, from c. 1160 to c. 1220, both Roger Reynolds and Hektor Amman support Krueger's conclusions that these cheap,

[3] For the differences between woollens, worsteds, and serges – in their composition and manufacture – see in particular Munro 2012b, 121-147; Munro 2009, 1-73; Munro 2005, 431-484; Munro 2003a, 181-227; Chorley 1997, 7-34.

[4] See Krueger 1987, 722-750.

relatively light northern textiles then clearly predominated over almost all Italian-manufactured textiles.[5]

Lombard fustians, c. 1180 to c. 1320

According to Krueger, 'only the Lombard fustians formed an impressive item of export', especially to Islamic and Byzantine markets.[6] The importance of those fustians is certainly substantiated in a monograph that Maureen Mazzaoui published on this industry, which, in her view, was then the predominant leader in Italian textile-manufacturing, outranking the *Arte della Lana* and all other similar wool-based Italian industries, in both volume and values of sales.[7] Fustians were also very light-weight, relatively cheap fabrics, but a non-wool hybrid composed of a linen (flax) warp yarn and a cotton weft yarn. The term fustian itself may be derived from the name of an important industrial suburb of Cairo, al-Fustāt, which much earlier, during the tenth or eleventh centuries, had become a very prominent producer of these textiles, by using local Egyptian flax for the linen warps and imported Syrian-Palestinian cotton for the weft yarns.

By the thirteenth century, the manufacture of these very light, comfortable and relatively inexpensive textiles had spread through the Mediterranean basin and even into Flanders, in northwestern Europe; but, by then, Lombardy had become the undisputed leader in the European production of these linen-cotton fustians. Mazzaoui may have exaggerated in describing Lombard fustians as a 'mass-production, mass-consumption' industry; but its products were undoubtedly quite cheap– if more expensive than domestic home-spun. Consequently, these fustians were very popular amongst the lower middle classes in not just Lombardy but throughout much of Europe during the later twelfth, thirteenth, and early fourteenth centuries. An Italian variant of the fustians were fabrics known as *tiretaines*, which were composed of various mixtures of woollen, linen, and cotton fibres. Some of the market for Italian fustians and similar cheaper textiles – possibly their major commercial market in medieval Europe – came from aristocratic households: in

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[5] See Reynolds 1929, 831-850; Ammann 1957, 275-310, esp. 308-309: Beilage I-II: Norwesteuropäische Tuche in Genua (1182-1213) , including *sagie, stanfortes*; Farmer 2006, 73-79.

[6] Krueger 1987, 744-747.

[7] Mazzaoui 1972, 262-286; Mazzaoui 1981, 28-72, 87-104.

supplying clothing for their servants.

Mediterranean textile markets, c. 1260 - c. 1320

According to Patrick Chorley, in his subsequent analysis of Mediterranean cloth markets during the later thirteenth and early fourteenth centuries, the composition of that textile trade remained largely unchanged from the previous century, with again a clear predominance of sales, both by volume and by aggregate value, in the form of relatively cheap, coarse cloths, the majority of which came from north-western Europe (though Italian fustians are not included in his survey). Once more, they were chiefly lighter serges (hybrid woollen-worsteds) and full worsteds; and more specifically, says, biffes, burels, rays, and stanfords. According to his estimates, this category of northern textiles had a value that was 'typically about 40-60 percent of that of the *lowest* grade of [Franco-Flemish] coloured woollens'. Citing two Iberian textile-price schedules from Spain and Portugal, in the early 1290s, he similarly found that the values of these northern lower-grade textiles were only 25 - 33 percent of those for such fine northern woollens.[8]

From early fourteenth-century Italian commercial accounts we find specific evidence to substantiate Chorley's views: from the records of two major Florentine firms, the Peruzzi and Del Bene companies, which then specialized in sales of northern textiles in Italy.[9] According to Richard Goldthwaite's analysis of the Peruzzi accounts for this era, this firm imported says from 'Ireland' (?), Caen (in Normandy), and Hondschoote (Flanders), while also selling similar textiles from many Italian and other Mediterranean producers: for example, those in Genoa, Milan, Altopascio (Tuscany), Naples, the Romagna, Venice, Cyprus (Venetian-controlled), and Provence.[10]

Much more detailed evidence comes from cloth sales by the Del Bene firm, for the five-year span of 1318-1323, which has been published in two separate studies, the first of which is again by Patrick

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[8] Chorley 1987, 349-379, esp. 360-361, 367 (Table 9). See also, Chorley 1988, 1-10, for similar evidence on textile types and prices.

[9] The most important documentary source is Sapori 1932.

[10] Goldthwaite 2009, 270.

Chorley. If we group the cloth prices in his study into two groups, by relative values, we find that the mean of prices for says, rays, and other cheaper cloths was than half (46.71 per cent) of the mean prices of the northern (chiefly Flemish) coloured woollens. In particular, prices for northern says (from Caen, in Normandy, and Ghistelles, in Flanders) were only 23.66 and 31.92 percent, respectively, of the mean value for the northern woollens.[11] The second and rather different study of cloth prices in the Del Bene accounts was undertaken by the late Hidetoshi Hoshino, the most prominent historian of the medieval Italian cloth industry.[12] If we again group his cloth-price data for northern textiles in a similar fashion, we find that the mean value of the northern says and similar cheaper textiles was 59.54 percent of that for the northern dyed woollens, and thus somewhat higher than in Chorley's study. But Hoshino's data contains a much wider variety of textiles, and includes Hondschoote says, not given in Chorley's study. Prices for good quality Hondschoote says were 56.25 percent of the mean values of those northern woollens, while those for Ghistelles says and Caen says were, respectively, 24.34 percent and 62.20 precent of the mean prices for the northern woollens (which here exclude *scarlets*, because of their unusually high values).[13]

Relative values of Italian wool-based textiles, c. 1260 - c. 1320

From similar sales registers of Florentine mercantile firms, Hoshino has also analysed the prices for a wide variety of wool-based cloths manufactured in Italian towns, from c. 1260 to c. 1320s, once more finding that their coarse, relatively cheap fabrics accounted for the majority of the Florentine firms' textile sales. The prices for such textiles, especially including the *saia e tritana,* ranged from 23 to 43 percent of the market prices for standard luxury quality woollens from the northern towns.[14]

We may cite two similar and supporting documented comparisons for this same era. According to

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[11] Chorley 1987, 355 (Table 3).

[12] The following discussion is based on data published in Hoshino 1983, 190 (Table 11.2); and Hoshino 1980, 70-71 (unnumbered table).

[13] For a discussion of the luxury woollens known as *scarlets*, see below n. 20 and pp. 000-00.

[14] Hoshino 1980, 65-113, esp. 95-114 (Tables IV-XV); Hoshino 1983, 184-204; see also Goldthwaite 2009, 265-70.

E. M. Carus-Wilson's analysis of a Venetian price list dated about 1265, 'almost without exception the Italian cloths are cheap; even the costliest do not approach in value those of Ypres, Douai, and Cambrai' [from Flanders].[15] The other and final comparison comes from a study of early fourteenth-century cloth markets in the Provençal town of Grasse, which indicates that prices for Florentine-made cloths were only about a third of those for Ypres' woollens: a mean of 14s *royaux coronats* per *canna* vs. a mean of 40.5s per *canna* for Ypres' *rubeum* (red) cloths.[16]

The Arti di Calimala to c. 1320

Obviously far higher quality, indeed ultra-luxury quality textiles also played a prominent role in Italian and other Mediterranean textile markets during this same period; and in Florence that luxury trade was conducted by the other and commercially far more powerful guild known as the *Arti di Calimala.*[17] Almost all of its trading goods were in the form of very fine, exceptionally costly woollens, produced not in Italy itself but again in northwestern Europe, especially in northern France and the southern Low Countries (Artois, Flanders, and Brabant). Virtually all of these costly woollens were woven from the finer English wools, whose quality was superior to those of any other known wools; and they would remain unrivalled in fineness, quality, and price until the wools from Spain, known as *merinos*, finally improved sufficiently in quality to challenge the English supremacy, though not before the later sixteenth century.[18]

The Italian merchants who acted as agents or buyers for the Florentine *Arti di Calimala* acquired most of these northern woollens at the Champagne Fairs, in north-eastern France, which served as the commercial

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[15] Carus-Wilson 1987, 646 (quotation), 649, 652.

[16] Aubenais 1959, 201-212, esp. 204, 206: with a range from 14s to 15s per *canna* of dyed Florentine cloths; but those of Genoa were even cheaper, at 8s. per *canna*. The Florentine canna = 2.333 metre = 4.0 *braccia.* Northern French *biffes* had an intermediate value: at 24s to 28s per *canna*, though some were as cheap as 10s a *canna*. See also Hoshino 1980, 71, for other prices from this source (without specifying the currency). For the current values of Angevin coinages in Provence, see Spufford 1986, 117-118. For the *canna* and *braccio*, see nn. 41 and 76 below.

[17] For the *Arti di Calimala*, see Sapori 1932.

[18] See Munro 1978, 118-169; Munro 2003a, 186-191; Munro 2005, 431-484.

hub or entrepôt for western Europe's international trade during the later twelfth, thirteenth, and early fourteenth centuries. These northern woollens were then transported from the Champagne Fairs down the Rhone Valley, and then, via Genoa, by sea to Italy, and to Florence in Tuscany in particular. Because of their provenance, these northern woollens were generically called *panni alla francesca*, while English wools were similarly if confusingly known as *lana francesca.*

In importing these northern woollens for resale either in Italy itself or abroad, in various Mediterranean markets, members of the *Arti di Calimala* devoted considerable labour, skill, and enterprise in finishing, dyeing, and dressing these textiles, according to current fashions and dictates of domestic and foreign markets.[19] Their value-added revenues, from dyeing and finishing, ranged from 20, 50, or even 100 percent of the imported value of the unfinished woollens, especially in producing kermes-dyed *scarlatti* (scarlets), the most costly and luxurious of all European woollens, rivalling even the finer silks in value.[20]

The First Florentine Textile Crisis: the 1320s

Warfare, population, and transaction costs in international trade, c. 1290 to c. 1330

The first and the most dramatic of the two crises in the Florentine cloth industry became fully manifest, in it consequences, by the 1320s and 1330s; but its fundamental origins lay in the wars that had plagued the entire Mediterranean and West European economies from the 1290s.[21] In the eastern Mediterranean, they began in 1291 with Mamlūk Egypt's conquest of Palestine, eliminating the last remaining European (Crusader) commercial outposts in the Levant. That conquest immediately led to fratricidal wars between Genoa and Venice (1291-1299) for control over the alternative Black Sea trade; and that chaos in turn facilitated, from 1303, Ottoman Turkish conquests of major Byzantine-held territories in

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[19] See Sapori 1932; Goldthwaite 2009, 269-72; Ashtor 1976, 657-686; Ashtor 1978, 303-377.

[20] Kermes (*kermès* in French; *chermes* in Italian; *carmes* in Spanish) was the vivid scarlet dye extracted at a very high cost from the desiccated eggs of various Mediterranean shield lice. For an economic analysis of the production and trade in medieval scarlets: see Munro 1983, 13-70; Munro 2007, 55-95; Munro 2009, 1-73; Munro 2012c, 477-478. For Italian scarlets, see Hoshino 1983-84/2001, 23-39.

[21] These wars later merged into the far more famous Hundred Years' War (1337-1453). For the following, see Munro 1991, 110 - 148; Munro 2001, 1 - 47.

both Anatolia and the Balkans. Muslim-instigated warfare had begun almost simultaneously in the West, in 1291, with the Moroccan Merinid (or Marinid) invasion of Spain, in alliance with Muslim Granada. Not until October 1340, was this Muslim threat finally vanquished by a combined Portuguese and Castilian army at the Battle of Rio Salado (or Tarifa), though destructive strife with Granada continued for a decade, until the peace of 1350.

In Italy, far more disastrous warfare had begun even earlier, amongst Christian powers, with the famous Sicilian Vespers (1282-1302) against Angevin French rule. After a brief peace, Italy was wracked by the Guelf-Ghibelline wars (1313-1343), which in turn provoked various foreign invasions – by Germans, Hungarians, Angevins, and Catalans – that continued until the 1380s. Meanwhile, from the mid-1290s, north-west Europe was also afflicted by war: the Anglo-Scottish, Anglo-French and Franco-Flemish wars, and related Flemish civil wars, which ended only with French intervention in August 1328.[22]

The importance of these wars, and their attendant features, for European and in particular the Florentine cloth industries and trade, was their role in dramatically increasing transportation and general transaction costs to an often prohibitive level in conducting long-distance trade in the cheaper textiles, especially between north-western Europe and the Mediterranean. Transaction costs are all those expenses that merchants and entrepreneurs incur in their role in transferring goods and services from producers to consumers. They include not only the most obvious – i.e., marketing and transportation costs -- but also information and protection costs, especially in negotiating, securing, and enforcing commercial contracts.[23] Thus, in the European-Mediterranean trading zones transaction costs rose steeply during this long era of protracted warfare: especially from disruptions in traditional overland and maritime trading routes, forcing merchants to find safer but more distant routes; and from the general break-down of civil authority that promoted increased brigandage, piracy, and state-supported corsair raids; and from increased commercial taxes and other aggressive fiscal policies, such as coinage debasement, to finance both warfare and defence,

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[22] See in particular TeBrake 1993.

[23] See North 1984, 255-264; North 1985, 557-576; Munro 2001, 1 - 47.

and from costly bans on trading with Muslim states and even Christian enemies (or costly trading licences).[24] Maritime commerce became radically more expensive from the 1330s, with the introduction of naval artillery, and with the ever rising costs of building and maintaining more and more heavily armed ships.[25] Finally, the steep fall in Europe's population, which had also begun in the early fourteenth-century, well before the Black Death (1348), itself contributed prominently to the steady rise in transaction costs in international trade simply because the transactions sector, in having very high fixed costs, was subject to significant scale economies, so that smaller, contracted markets meant far higher unit costs in trade. That population decline, which the Black Death greatly accelerated, was due to a variety of factors, but certainly warfare, violence, and insecurity were among the more important in the pre-Plague era.[26] Continuous warfare, the Black Death, and subsequent declines in population also acted to increase transaction costs in yet another way: by increasing the per capita public-debt burden for survivors, chiefly through rising taxation.

The Decline of the Champagne Fairs, c. 1290 - c. 1320

In international trade, the first direct and major casualty of warfare (and of the related rise in transaction costs along traditional transcontinental routes) was the destruction of the Champagne Fairs, on which the European and especially Italian dominated textile trades had depended so vitally in the later twelfth and thirteenth centuries. Many historians have incorrectly stated that the decline and fall of these Fairs was primarily due to the Italian's establishment of a new direct sea route by the Mediterranean and the Atlantic

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[24] For the following, see Munro 1991, 110-148; Munro 1997, 56-64; Munro 1999, 103-104; Munro 2001, 1 - 47.

[25] See Katele 1988, 865 - 889; Kedar 1976; Bresc 1980, 751-757; Heebøll-Holm 2013.

[26] See Wolff 1957, 495-503, esp. 562, with the table indicating the fall in the number of foyers in the town of Millau: from 1835 in 1309 to 1541 in 1346, i.e., before the Black Death. See also Baratier & Reynaud 1951, 38-40, 207-228, 304-313; Lesage 1950, 185 (doc. no. 6): letter of Robert d'Anjou (King of Naples), dated 21 Oct. 1331, concerning the serious depopulation of Marseille; 184-186 (doc. no. 7): on the serious decline of Marseilles' population from the 1290s. In Tuscany, Prato's urban population declined by 26.9 percent from 1300 to 1339; and its rural population by 38.7 percent. In neighbouring Pistoia, the population declined by 36.3 percent from 1244 to 1344 (well before the Black Death). See Herlihy & Klapisch-Zuber 1985, 60-92, esp. 62 (Figure 3.1), 63 (Table 3.1), 71 (Table 3.3), 73 (Table 3.4), 74 (Table 3.5); and also Herlihy 1967, 55-77, esp. 69-70 (Graph I and Table 1); and 271-272 (Appendix 1); Day 1987, 185-224.

to Bruges in Flanders and Southampton and London in England. But that maritime route was not fully established until the 1320s, long after the decline of the Fairs had become fully evident. Furthermore, even if the Italian's new maritime route to north-west Europe did generally prove to be less costly than trade along the now war-torn overland routes, it was certainly not a major advance in international trade. In fact, the transition from overland to these maritime routes was a retrograde measure, because the new sea route was at least five times longer than overland continental routes between Italian ports and the Low Countries, and it involved far, far fewer towns and regional markets than had the continental, Champagne-based routes. Furthermore, as just noted, warfare, corsair raids, and piracy were already imposing very substantial costs on this seaborne trade. Even in peaceful times shipping was often subjected to destructive ocean storms. With still primitive navigational techniques, above all the inability to calculate longitude, most Italian mariners were forced to keep within sight of the long Atlantic coastlines from the Straits of Morocco to northern France, Flanders, and England.[27] All these reasons thus explain why Venetian galleys sailed only intermittently during the later fourteenth and early fifteenth centuries.[28]

The virtual disappearance of Mediterranean trade in the once-cheaper northern textiles

Certainly the new maritime shipping routes – so intermittent in the fourteenth though more frequent in the fifteenth century – offered no salvation for the every more costly long-distance export trade in worsteds, serges, and similar cheap and light textiles from northwestern Europe to the Mediterranean basin, nor even for such trade in similar Italian textiles in this region.[29] There are two related sets of evidence for

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[27] See especially Munro 2001; and also Munro 1991, Munro 1994b, Munro 1997, Munro 1999a, Munro 1999b, Munro 1999c. For the most recent study on the fairs, see Edwards & Ogilvie 2012; see also Menard 1991.

[28] According to Venetian state records, the Flanders galleys made only 24 northbound voyages from 1332, when state-subsidies commenced, to 1400 (i.e. a mean of 2.8 per decade); but in the relatively more peaceful and commercially more propitious fifteenth century they made 86 such northbound voyages. See Tenenti & Vivanti 1961, 83-86. A more accurate record can be found in Stoeckly 1995; but unfortunately her study ceases in 1453, thus preventing a valid comparison of these two centuries.

[29] In 1398, the Italian merchant Gulgielmo Barberi, an employee of the Datini firm in Prato, reported that the cost of shipping Wervik woollens from Bruges to Barcelona by sea amounted to 15 percent of the price (22 florins), while shipping them overland, when routes were safer, cost 22 percent of that price. But

the virtual disappearance of the trade in these northern textiles, from the 1320s or early 1330s. In the abundant Italian commercial records for textile sales in the Mediterranean basin – in Spain, Sicily, Constantinople, Beirut, and Alexandria – no further references to these cheaper, lighter northern cloths can be found from these years (and not before the mid fifteenth century), except for a few, occasional 'Irish says', which may have been English worsteds.[30] Similar evidence can be found in the virtual disappearance of the various *sayetteries* and the related *draperies légères (draperies sèches*), in northern France, the southern Low Countries, and England, especially those that had specialized in producing relatively light and cheap worsted or semi-worsted fabrics for export to Mediterranean markets. England (East Anglia), to be sure, continued to produce worsteds for export to Germany and the Baltic, for several more decades, until they too virtually disappeared, by the 1380s, when various adverse conditions, especially a rise in piracy and Polish-German warfare, similarly increased transaction costs in this northern commerce.[31]

The plight of the Italian (Lombard) fustians industry in the fourteenth century

In fourteenth-century Italy, we find evidence for a similar relative decline of those cheaper-line export-oriented textile industries, though on a lesser scale than that experienced in north-west Europe. Obviously the demand for cheaper textiles did not disappear – demand that often came from aristocratic households, for their servants. Just as obviously Italian producers of such textiles enjoyed a comparative advantage over their northern rivals in having lower transportation and transaction costs.

The most important example of such industrial malaise can be found in the once-renowned Lombard

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he also explicitly noted that some other merchants had 'lost all their profit' by so foolishly choosing to send their woollens overland. Letter to the Datini Co. in Barcelona, 10 May 1398: cited in Melis 1962, 219-243, quotation on 233 n. 30. In contrast, we may note that, around 1310, the costs of transporting far cheaper Caen *sayes* overland via the Champagne Fairs and the Rhone valley route to Florence had cost only 8.8 percent of their much lower value (11.5 florins). Sapori 1932, 97-99: 1.01 florin per say in transporting 133 says; but total marketing costs amounted to 2.20 florins per say (19.2 percent). See n. 37 for the high costs of shipping English wool to Venice, by sea.

[30] See the evidence cited in Munro 1991, 110-48; Munro 1997, 35- 127; Munro 1999a, 103-41; Munro 1999b, 1-74; Munro 2001, 1 - 47.

[31] See the sources cited in n. 30 above.

fustians industry. From the 1320s, it too experienced a slow but irredeemable decline, one that was also clearly related to warfare. For, as stressed earlier, no part of western Europe suffered more ravages from warfare than did Italy, from 1313 until well into the 1380s. By this time such warfare had certainly contributed to the rise of the German competitors who would spell the final death knell for the Lombard industry. When the major South German towns – Ulm, Augsburg, Ravensburg, Constance, and Basel -- found that wartime disruptions prevented them from securing their traditional supplies of Lombard fustians, they began converting their own domestic-oriented linen crafts into the manufacture of linen-cotton fustians, for export. By the fifteenth century, these South German towns had expanded what was initially just an import-substitution industry into western Europe's most important producer of lighter, relatively inexpensive textiles.[32]

The shift to luxury export-oriented cloth production: in north-western Europe and Italy

Among the wide range of European textile producers, the chief victims of the fourteenth-century rise in transaction costs were northwestern Europe's *sayetteries* and related *draperies légères* industries that had depended on exports to Mediterranean markets. Because both northern and Mediterranean manufacturers had been producing very similar, undifferentiated textiles, all had to act as *price takers* in those markets. Consequently, the northern producers were unable to raise their prices to compensate for their far higher transportation and marketing costs in reaching these far-distant markets; unable to compete, and suffering chronic losses, most were forced to withdraw from this Mediterranean trade. Thus the northern cloth producers found, by the 1330s, that their only long-term survival strategy was to shift their export-oriented cloth production more and more to far higher-priced luxury woollens, while retaining some lower-priced production for domestic markets. In doing so, they also transformed themselves from *price-takers* into *price-makers*: i.e., to engage in monopolistic competition, by producing highly differentiated products (without close substitutes). Now better able to set profit-producing market prices they were thus also better able to

[32] See Mazzaoui 1972, 262-286; Mazzaoui 1981, 129-153; Kellenbenz 1983, 259-278; von Stromer, 1978.

absorb the rising transport and transaction costs, while also benefiting from a superior value:weight ratio than they had encountered in marketing the cheaper textiles.[33]

The transformations of Florentine and other Italian textile production from the 1330s to the 1370s

The decline of the Arte di Calimala and the rise of the Arte della Lana in Florence from the 1320s

In fourteenth-century Italy, the industrial and commercial reorientation towards luxury woollens was much less pronounced than in north-western Europe, simply because, as stressed earlier, the Italian producers of and merchants trading in cheaper textiles had retained an important comparative advantage in transaction costs, especially in enjoying far larger domestic urban markets. Nevertheless, the transformations favouring both the production and trade in luxury textiles (later including silk) had become clearly evident by the 1320s and 1330s, to become the most significant feature of late-medieval Italy's commercial-industrial economy. For Florence's own economy, that transformation meant the simultaneous and very dramatic changes in both of its renowned textile guilds: the virtual extinction of the *Arte di Calimala* and the rapid expansion of the now radically transformed *Arte della Lana*, previously the far less important guild.

At first glance, the plight of the *Arte di Calimala* might be attributed solely to the growth of of the *Arte della Lana* as an import-substitution industry. For the latter, from the 1320s, was devoting more and more of its output to woollens known *panni alla francesca:* those directly imitating Franco-Flemish woollens, also woven entirely from the finest English wools, and thus of the very type that the *Arte di Calimala* had previously imported from the north. Nevertheless, both the proximate and fundamental cause of the *Arti di Calimala*'s downfall was instead the precipitous decline of the Champagne Fairs, now virtually extinct, by the later 1320s, with the final destruction of its traditional overland trading networks.[34]

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[33] See the sources cited in n. 30 above; and also Munro 1999, 1 - 30; Munro 1990, 41 - 52; Munro 1994a, 377-388. As these studies make clear, those northern producers engaging in monopolistic competition, especially those in the Low Countries, did not do so as individual entrepreneurs but as members of urban guilds that imposed rigid quality controls and uniform standards, with close inspections, so that the luxury woollens were deemed to be products of those towns and not of the individual drapers. In Florence, that guild was, of course, the *Arte della Lana*.

[34] See also Goldthwaite 2009, 272-273, on import-substitution industries in Florence.

Thus one may contend that the chain of historical causation was the reverse: that the collapse of the *Arte di Calimala*, because of these external factors, led to both the expansion and transformation of the *Arte della Lana*, in the manner just described. Such an interpretation might still justify the view of the *Arte della Lana* as an import-substitution industry (under such historical circumstances), but only if its raw materials were domestic in origin. The contrary was necessarily true, however, because all luxury-quality European woollens of this era had to be woven only from imported English wools, indeed from the very finest, for reasons explained earlier.[35] One might well assume, in terms of the oft-cited value:weight ratios, that importing semi-finished woollens from the southern Low Countries, though now by sea, would still have been cheaper, more cost-effective than importing English wools, especially since so much of the wool – about 35 percent by weight – was lost in the Italian cloth production processes.[36] Indeed, fifteenth-century evidence indicates that shipping Cotswold wools from Southampton to Italy added 25 percent to total costs.[37]

External economies justifying the costs of importing wool: papal taxation, loans, and bills of exchange

Nevertheless, Italian, and above all Florentine, merchants then enjoyed a very important and indeed crucial external economy that fully justified the costs of shipping these wools from England to Italy: their role as papal-tax collectors and merchant-bankers, thanks primarily to the very strong alliance between Florence's ruling Parte Guelfa and the Papacy, from the 1260s. Furthermore, the Florentine merchant bankers provided loans to not only the Papacy but also to the English crown. Their latter lending role allowed the Florentines to gain control over the English wool-export trade, when, from 1275, Edward I (r. 1272-1307) inaugurated the almost three-century long policy of levying taxes on such wool exports.[38] In essence, the Florentine

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[35] See above, p. 000 and n. 17.

[36] See below, pp. 000 and Munro 2012a, 195 (Table 11).

[37] Fryde 1974, 291-337; Fryde 1972, 345-55.

[38] The initial export tax (1275) was 6s 8d per sack of wool. In 1294 the wool trade was dominated by eight Florentine and two Lucchese firms: the Frescobaldi Bianchi, the Frescobaldi Neri, the Cerchi Bianchi, the Cerchi Neri, the Bardi, the Pulci-Rimbertini, the Mozzi, and the Spini (all from Florence); and the Riccardi and Bettri (from Lucca). For the Italian role in the English wool trade, see Lloyd 1977, 60-98, 136-140, 185-189; and Goldthwaite 2009, 203-255; Bell, Brooks, & Dryburgh 2007, 11-67.

merchant bankers made their loans conditional upon receiving collateral in the form of the wool-tax revenues, and indeed control over the English wool customs.

The Italian financial instrument that, from this very era, provided the Florentine merchant-bankers with the effective link between collection of papal taxes in northern Europe and the Florentine export of English wools to Italy was the recently devised bill of exchange.[39] It was simply a principal-agent credit instrument with a dual function: to finance international trade and to remit payments abroad without having physically to ship precious metals, since payments were made only in the local currencies of those involved. The following example involves two principals in London, who made and received payment in pounds sterling: Italian merchant A, as the deliverer or remitter (*datore*, *remittante*); and fellow Italian merchant B as the taker or drawer (*prenditore, traente*). The other two were their agents in Florence who made and received payment in Florentine florins: merchant C, as the drawee or payer (*trattorio, pagatore*), and merchant D, as the payee (*beneficiario*). In this example, merchant A furnished or lent a sum of money to merchant B, for investment in the latter's wool-export trade. In return, B provided A with a bill of exchange, or letter of payment, by which he commanded his financial agent C in Florence to make a specific payment on his behalf to merchant D, as A's financial agent. All such foreign-exchange bills specified both the payment or maturity date (usually 90 days later) and the rate of exchange (pounds sterling for Florentine florins) for the payment on maturity. In effect, the Florentine merchant-bankers used the papal taxes that they collected (in coin) to purchase English wools, and then bills of exchange to remit the funds to Florence and to Rome, profiting on both the financial and commercial transactions, while avoiding the great risks and attendant costs of shipping bullion, in this dark, troubled era of increased violence on both land and sea.[40]

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[39] On the evolution of the Italian bill of exchange, see de Roover 1946-47, 111-128; de Roover 1953; Munro 2003, 505-562; Denzel 2008, 153-194.

[40] Because of the crucial important that the payer or acceptor played in this principal-agent transaction, bills of exchange came to be more commonly known as acceptance bills by the seventeenth century; and to this present day, acceptance bills have been the chief mechanism for financing international trade. The bill-of-exchange also served a useful function in evading the universal prohibition against usury, by disguising interest in the exchange rates. See the sources cited in n. 39 above.

The growing importance of Florentine luxury woollens in the Italian export trade from the 1330s

Despite the high costs of using English wools (albeit subsidized by the merchant-bankers), the *lanaiuoli* of the *Arte della Lana* proved to be very successful, by the 1330s, in shifting much of their cloth production from the previously predominant light, cheaper fabrics to the *panni alla francesca*, the far heavier, very expensive luxury-quality woollens made exclusively from the finer English wools. According to Hoshino, the proportion of the *Arte della Lana*'s production devoted to the relatively cheap products had fallen from about two-thirds of the total (by value) in 1321-22 to just to just 25 percent in 1336-39, so that the luxury-quality *panni alla francesca* were now accounting for three-quarters of the their output, by value.[41] Hoshino also notes that in 1349 the *Arte della Lana*, in replenishing losses from the Plague, admitted 33 new members, of whom 22 or two-thirds joined the sector producing these *panni alla francesca.*[42] That assertion does not necessarily contradict his previous statement (two-thirds vs. three-quarters), since we do not know how much the new members contributed to the *Arte della Lana's* total output by value.

The extent to which the Florentine cloth industry did shift its textile production to luxury woollens still remains a matter of dispute (as will be seen later in this study); and certainly not even Hoshino contended that such a shift ever became complete. Proof that it never became complete can be seen in the subsequent fourteenth-century division of the *Arte della Lana* into two rigidly distinctly separate sectors: the more prominent, in the mid to later fourteenth century, was the San Martino sector, whose members were forbidden to use any but English wools, and indeed any but the finer varieties.[43] Thus, in the years 1355 to 1368, the

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[41] Hoshino 1983, 189 (Table 11.1): that 75 percent of cloths produced were in the price range of 45 to 55 *soldi* per *canna* (2.333 m.). A standard piece of Florentine cloth, known as a bolt, then possibly measuring 18.875 *canne* = 75.50 *braccia* in length (width unknown), priced at 55s per *canna*, would have then been worth 1038.125 *soldi* = 17.30 gold florins (1 florin = 60s or £3.000). The Florentine *canna* = 2.333 metre = 4.0 *braccia* (0.583 m); see n. 16 above. According to Goldthwaite 2003, 527-54, a sixteenth-century bolt of Florentine woollen cloth was somewhat shorter: measuring 61.77 *braccia* in length = 15.4425 *canne* = 36.012 metres. See n. 76 below; and also Munro 2012a, nn. 24, 38, 46, 67, 77, 98, and 216.

[42] Hoshino 1981, 50-51.

[43] The name *San Martino* comes from the convent of that name, situated between the Duomo (cathedral) and the Palazzo Vecchio, where most of the cloth production using English wools took place. That requirement for all *lanaiuoli* in the San Martino sector to use English wools exclusively was reiterated

records of the Del Bene firm, a member of the San Martino sector, state that 80 percent of its English wools (49,568 kg) came from England's three regions that produced the most expensive wools: 46.03 percent from the Cotswolds (Gloucestershire, Worcestershire, Oxfordshire, and Berkshire); 25.73 percent from the Welsh Marches (Shropshire, Herefordshire); and the remaining 7.29 percent, from Lincolnshire.[44]

The other sector was known as the Garbo branch, whose members were conversely forbidden to use any English wools whatsoever, thereby restricting them to domestic Italian and other relatively cheap and coarse Mediterranean wools.[45] The purpose of this restriction was two-fold. The first and perhaps primary reason was to re-assure European customers that the San Martino woollens were of the very highest quality, and not adulterated with inferior wools. The second reason was to reserve all available English wools exclusively for the San Martino sector, especially when that supply was under increasing threat, for reasons to be seen shortly. The rest of this study is devoted to the fate of the San Martino sector, until it was displaced finally by the Garbo sector in the early to mid fifteenth century.

The volume of Florentine cloth production, from c. 1320 to c. 1420: from peak to trough

That the *Arte della Lana*'s cloth production experienced a very severe decline over the course of the fourteenth century indisputable, though its exact extent remains a matter of debate. A summary of that evidence, from the famous Florentine merchant and chronicler Giovanni Villani (c.1270/80 - 1348, dying in the Black Death) and three leading modern historians (Hidetoshi Hoshino, Francesco Franceschi, and Richard Goldthwaite), is presented in Table 1. The first phase of that decline was due entirely to the first crisis, from the 1320s, as explained above; and that decline was not in itself necessarily a negative aspect of

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in an *Arte della Lana* ordinance issued in 1408. See Hoshino 1980, 208; Franceschi 1993, 22; Goldthwaite 2009, 273.

[44] Hoshino 1980, 216 (Table 26).

[45] See Goldthwaite 2009, 278 (Table 4.1), estimating that, in the late fourteenth century, the San Martino sector accounted for only about 40 to 43 percent of total Florentine cloth production, so that the Garbo sector accounted for the rest. How much of the latter output was for local markets and how much for exports cannot be determined. Goldthwaite's estimate differ sharply from those of Hoshino, who credits the San Martino sector with 75 percent of production (or for the export sector). See Hoshino 1980, 153-229; Hoshino 1983, 191-204.

the industry's commercial fortunes. According to Villani, the industry's output had fallen from about 100,000 pieces around 1310, by 25 percent, to about 75,000 in the years 1336-38.[46] Nevertheless, he also contended that the value of that output of the late 1330s was still higher than the value in 1310, 'when English wools were not imported', and when earlier cloths 'were coarser and worth only half as much'. His observation that the value of the 1338 output was 1.2 million gold florin indicates that the average value of each piece or bolt of cloth was only 16 florins – which is very close to Hoshino's upper-bound estimate for values of the *Arte della Lana*'s *panni alla francesca* in that same year: 17.3 florins.[47] Equally revealing is Villani's contention that the total output of about 75,000 woollens was produced by only 200 *botteghe* (*lanaiuoli* textile firms), and thus with an average output of about 375 bolts per firm. Though one may well doubt the accuracy of any such estimates from a medieval chronicler, Villani's observations are nevertheless in accordance with the known historical evidence for the fourteenth-century *Arte della Lana*.[48]

Subsequently, during the twenty-year period from 1355 to 1374, the output of the Florentine cloth industry underwent an overall decline of just over a third, falling to an estimated 49,044 bolts per year, according to Francesco Franceshi. His data also indicate that the mean annual output per firm had fallen to just 122 bolts a year, but partly because the total number of *botteghe* had risen to 402 for these years.[49] In support of that estimate of lower mean outputs per firm, we may cite a post-Plague *Arte della Lana* ordinance of 1349 that set a quota of 220 bolts for established firms, and one of just 50 bolts for new firms in their first

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[46] Villani 2007, III: *Libri XII - XIII,* libro XII, cap. XCIV, 197-202, esp. 199: 'Le botteghe dell'arte della lana erano CC et più, e faceano da LXX^{m} in LXXX^{m} di panni, di valuta di più du MCC migliaia di fiorini d'oro'. Thus 75,000 *panni* is the mean of his two estimates for 1336-38. But earlier, c. 1310: 'Ben trovamo che da XXX anni adietro erano CCC bottegha or circa, e faceano per anno più di C^{m} panni; ma erano più grossi della metà valuta, però ch'allora non ci venia né sapeano lavorare lana d'Inghilterra, com'janno fatto poi'.

[47] See Hoshino 1980, 153-211, especially 194-200; and also Hoshino 1981, 42. For the length of the bolt (and of the *canna*), see nn. 16 and 41 above, 76 below.

[48] See Hoshino 1980, 194-200, for a criticism of Villani's figures, providing instead an implausible estimate of just 24,000 - 30,000 woollens produced per year in the later 1330s. For my defence of Villani and objections to Hoshino's estimates, see the detailed discussion in Munro 2012a, 94-95.

[49] Franceschi 1993, 8.

year of guild membership.[50] Further evidence comes from the ledgers of the aforementioned Del Bene firm, for the 14.333 year period from May 1355 to September 1369, which record a total output of 2,023 bolts, for an annual mean of just 141.14 bolts.[51]

That twenty-year period (1355 to 1374) encompassed both a commercial boom and then a recession, which became so severe that, in September 1370, the Del Bene firm was forced to cease all operations. Three years later, in 1373, as the recession deepened, the Florentine industry produced no more than 30,000 bolts, according to estimates now commanding widespread agreement; and that is only 40 percent of Villani's estimate for 1338. [52] Worse was yet to come. As that recession became a depression, and when Florentine government finances and the economy became ravaged by war, the disenfranchised textile workers staged a bitter and almost successful rebellion in 1378, known as *Il Tumulto* or the Revolt of the Ciompi. One of the Ciompi's key demands was that the *lanaiuoli* be required to produce at least 24,000 bolts of cloth a year. One may reasonably assume that annual cloth outputs were then well under that number.[53] Indeed, in 1382, when the *Arte della Lana* and other Florentine merchant guilds of the *Arte Maggiori* staged their successful counterrevolution against the Ciompi allies in the *Arte Minori*, total annual cloth production had fallen to about 19,300 bolts, with an average output of just 68.32 bolts per *bottegha*.[54] A decade later, by the early 1390s, according to most of these same historians, the *Arte della Lana's* cloth output had fallen even more

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[50] Najemy 1981, 70-71; Najemy 2006, 149-50; Hoshino 1981, 50.

[51] Hoshino 1981, 41-58, esp. tables on 57. These 2,023 *panni* were woven from 145,985 lb. of English wools and just 1,959 lb. Burgundian wools. The Florentine pound or *libbra* weighed 339.542 g.

[52] Franceschi 1993, 7-8; Hoshino 1980, 194-200; Hoshino 1981, 41-58; Goldthwaite 2009, 278 (Table 4.1)

[53] For these events, see Najemy 2006, 124-186; Cohn 1980; Cohn 1984, 143-164; Cohn 2004, 201-260; Cohn 2006, 57-65; see also Munro 2012a, 86-93 (and sources cited therein).

[54] See, first, Davidsohn 1928, 250: stating 19,474 bolts in 1381-82; Hoshino 1980, 227 (Table XXVI): stating 19,296 bolts; Franceschi 1993, 13 (Table 2), also stating 19,296 bolts for 1381-82. According to Franceschi, this total output was produced by 283 *botteghe*, each of which thus had an annual mean of just 68.20 bolts.

dramatically, by another 30 percent: to just about 13,350 bolts a year.[55] The susbsequent decline, over the next twenty or so years, was, however, a more gradual one.

According to all modern historians, the *Arte della Lana* reached the late-medieval nadir of its cloth output in the 1420s or 1430s. Hoshino provided our first modern estimate, for the years 1425-30: 11,000 to 12,000 bolts, about 42 percent below the estimated level for the early 1380s.[56] More recently, both Franceschi and Chorley have published even lower annual estimates: of just 9,000 - 10,000 bolts (only half of the 1380s output) in the 1420s, and just 8,333 pieces in 1437.[57] Subsequently, Goldthwaite has supported Hoshino's earlier estimate, while further contending that the annual output of 11,500 bolts (as the mean of the two figures) was worth 437,662 gold florins (= £1,750,648 *lira di piccioli*). Of this total, according to Goldthwaite, the luxury-oriented San Martino sector accounted for 37 percent (161,935 florins), with an average value per cloth of 54.75 florins (= £219 *lira di piccioli*); and thus the Garbo sector accounted for the remaining 63 percent (275,727 florins) with an average value of 31.00 florins (=£124 *lira*). From this data, we may extrapolate the following division in sector output, for a total of 11,852 bolts: 2,958 bolts from the San Martino sector, and 8,894 bolts from the Garbo sector.[58] Thus, by the 1420s, the roles of the San Martino and Garbo sectors had been reversed from those of the mid-fourteenth century, chiefly because of the following factors that fully explain why the former's decline was inevitable.

Factors in decline of the Florentine cloth industry (1): falling population and the demographic crises

There are at least three related factors that explain why such a drastic, overall decline in output had been virtually inevitable for the Florentine cloth industry, but most especially for the San Martino sector:

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[55] See Hoshino 1980, 194-200; Goldthwaite 2009, 278 (Table 4.1); Franceschi 1993, 13 (Table 2), stating the mean output for the years 1391-95 was 13,358 bolts.

[56] Hoshino 1980, 204-05. This output, with a value estimated at 350,000 to 400,000 florins (an average value ranging from 33.33 to 36.36 florins) is also cited in Dini 1990, 321-359.

[57] Franceschi 1993, 13 (Table 2): about 9,000 to 10,400 pieces in 1427, and between 9,130 and 10,967 pieces in 1430. See also Chorley 2003, 487-526 (esp. 488).

[58] Goldthwaite 2009, 278 (Table 4.1). In the years 1420 - 1425, the mean value of the gold florin *in lira di piccioli* was £4.000. See Bernocchi 1976, 84-86; Spufford 1986, 18-21.

demographic factors, market changes (luxury re-orientation), and changes in the wool supply. As destructive as was the Revolt of the Ciompi (1378-1382), we may view that more as a consequence of the factors to be considered than as a separate primary cause.

The first was the precipitous drop in both Europe's and Florence's own population, though the extent of the fourteenth-century decline remains a matter of considerable dispute, especially for Florence. In 1978, David Herlihy and Christine Klapisch-Zuber, the most renowned demographic historians of medieval Tuscany, contended that Florence's population in 1338 was about 120,000.[59] Recently, Najemy (2006) cited that very same figure for Florence – but, for the much earlier date of 1300.[60] Even more recently, Goldthwaite (2009) has cited various estimates for Florence's population in 1300, ranging from 90,000 to 130,000, while favouring an intermediate figure of 100,000 (not the mean of 110,000), below that of the other historians cited.[61] Equally frustrating is the failure of these historians even to speculate on whether or not Florence itself experienced any population decline between 1300 and 1338. Herlihy and Klapisch-Zuber do, however, provide evidence that neighbouring Prato, also an important Tuscan textile-making town, suffered a population decline of 26.9 percent from 1305 to 1339, while its rural *contado* population fell even more, by 38.7 percent. According to their data, Pistoia also suffered a major demographic decline before the Black Death: of 36.3 percent, but over the much longer period from 1244 to 1344.[62] As was noted earlier in this study, Marseille and Provence (SE France) also experienced some significant demographic losses in the early

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[59] See Herlihy & Klapisch-Zuber 1985, 67-79, disputing Giovanni Villani's well-known estimate of just 90,000.

[60] Najamey 2006, 97.

[61] Goldthwaite 2009, 22; and 278, Table 4.1. Goldthwaite cites Ginatempo & Sandri 1990, 148; but their table for Florence's population in 1300, on p. 148, states: 'oltra 100 mila'. See also Nicholas 2003, 19 (fig. 1.3), providing the lower figure of 90,000 for Florence's population in 1300; and Malanima 2013, 6: cites an estimate of 110,000 for Florence's population in 1300 (and one of just 37,000 in 1400).

[62] See n. 26 above, especially Herlihy & Klapisch-Zuber 1985, 60-92, esp. 62 (Figure 3.1), and 63 (Table 3.1), 71 (Table 3.3), 73 (Table 3.4), 74 (Table 3.5); Herlihy 1968, 55-77, esp. 69-70 (Graph I and Table 1), and 271-82 (Appendix I).

fourteenth century, well before the Black Death.[63]

The Black Death itself certainly exacted a devastating toll on Florence; for, the tax records of 1352 and 1355 indicate populations of only 41,600 and 41,711, respectively.[64] That is only about a third of the earlier maximum estimate of 120,000 – but does not, of course prove, that the plague itself eliminated two-thirds of the population. Subsequently, in the later fourteenth century, Florence evidently enjoyed some demographic recovery, probably from rural immigration, because a tax-based census for 1380 records 54,747 inhabitants; and another indicates further growth, with a population of 60,000 in the late 1390s.[65] Thereafter, Florence's demographic fortunes turned against her, with a steady decline, chiefly from further waves of plague – especially in 1400, 1417, and 1424. The nadir of her population was reached in 1427, with only 37,144 inhabitants, as recorded in the famous *Catasto* (tax census): just 31.0 percent of the medieval maximum.[66] Elsewhere in Tuscany, most neighbouring towns and the rural *contado* in general suffered population losses of similar magnitudes. Prato's urban population had fallen from 10,559 in 1339 to 6,070 in 1357, reaching its nadir in 1427, as well, with just 3,533 inhabitants, for an overall decline of 76 percent. San Gemignano suffered the very same decline: from c. 13,000 inhabitants in 1332 to 3,138 in 1427.[67]

Our initial and major explanation for the aforementioned dramatic decline in Florentine cloth output

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[63] See n. 26 and above, pp. 000 above.

[64] Herlihy & Klapisch Zuber 1985, 69, n. 23: indicating taxable hearths of 9,955 (1352) and 9,904 (1355), for which they apply a household multiplier of 4.19, which may be too high. See also Najemy 2006, 100, citing the same figures and household multiplier; and he also quotes Matteo Villani's estimate of a 60 percent mortality from the Black Death itself.

[65] Herlihy & Klapisch Zuber 1985, 69; Najemy 2006, 100: 13,074 households, with the same multiplier of 4.19 (in 1380).

[66] Herlihy & Klapisch Zuber 1985, 74 (Table 3.5): 9,780 households, with the lower family multiplier of 3.80 = 37,144 inhabitants. Slightly different figures are given in Goldthwaite 2009, 278 (Table 4.1): 40,000 inhabitants; Najemy 2006, 100: 37,225 (in 10,171 households, with a multiplier of 3.65).

[67] Herlihy & Klapisch-Zuber 1985: 62-63 (fig. 3.1, Table 3.1). The population of the countryside around Pistoia declined from an estimated 23,964 in 1344 to 11,772 in 1427 (according to the 1427 *Catasto*). See Herlihy 1967, 70 (Table 1). See evidence for similar declines in the hillside villages surrounding Florence (1356 to 1427), in Cohn 1999, 86-88 (figs. 3.1 - 3.3).

is, therefore, the obviously drastic loss in the town's labour supply, for no which no conceivable remedy could have been found in technological innovations for an essentially labour-intensive industry. Indeed there were no technological innovations of any note in this era.[68] Nor did rural immigration continue to compensate for urban losses in the labour supply. Nevertheless, the industrial problem was not one of labour scarcity, as is clearly evident in the Ciompi's 1378 demand for a minimum quota of production.

Instead, the problem, certainly in the 1370s and 1380s, was insufficient market sales, reflecting a severe contraction in aggregate demand. That contraction cannot, however, be seen purely in terms of a 40 percent fall in Europe's population, at least from the time of the Black Death, but rather in terms of all the other related, accompanying, and ancillary factors: the disruptions to established trade routes and trading connections from plague itself, from warfare, brigandage, general insecurity, and the rising costs of financing both warfare and defence, as illustrated earlier in the analysis of rising transaction costs, which also demonstrated that market contraction necessarily led to steep increases in unit transaction costs.[69]

Factors in decline of the Florentine cloth industry (2): changes in the market for Florentine woollens

The second and related factor that further explains the sharp decline in the cloth outputs of not just the *Arte della Lana* but more specifically of its San Martino sector was the radical reorientation in markets that necessarily resulted from the shift to luxury production, one that inevitably meant far smaller markets. According to a very large amount of evidence from fourteenth-century cloth sales throughout the Mediterranean basin, the mean wholesale market price for Florentine woollens at least tripled, in stable gold florins, from the 1330s to the 1390s.[70] Earlier, we had noted Villani's estimate for the average value of Florentine woollens in 1338: 16 gold florins, which may have been double that of 1310. Hoshino

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[68] See Munro 2003a, 191-204.

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

[70] Unlike Florence's silver coinage, its gold florin remained relatively stable in its weight and fineness (about 23.875 carats) during the fourteenth century. In 1334, the florin was worth £2.975 in the *lira di piccioli*, with a gold:silver ratio of 10.91:1; and in 1390, it was worth (about) £3.750, with a gold:silver ratio of 10.34. See Bernocchi 1976, 79, 177, 208.

independently computed a mean value of 17.3 florins for woollens that the *Arte della Lana* produced during that same year.[71] We also noted Goldthwaite's estimate for the average value of San Martino woollens in the 14220s: 54.75 florins vs. 31.00 florins for woollens of the Garbo sector; and that was not much different from the values recorded in the 1390s.

We cannot, however, rest content with price estimates from other historians, and must consider the evidence from the cloth markets themselves, a summary of which is presented here in Table 2. That collected evidence and the summary in Table 2 clearly demonstrate that, in the second half of the fourteenth century, the most expensive woollens sold in Mediterranean towns came almost exclusively from Florence, despite growing competition in the luxury cloth trades from other Tuscan and Lombard towns.[72] They also demonstrate that the mean price of Florentine woollens rose steadily over this half century. Thus, for the years 1354 to 1371, the mean price for Florentine woollens sold in Pisa (near Florence) was 43.35 gold florins or £6.50 sterling; and the highest priced woollens were 115 florins or £17.25 sterling, compared to an average value of £2.000 to £2.400 for first quality exported English broadcloths in the 1370s. In comparison, we find that evidently high-quality Lombard woollens from Milan and Como had a far lower average sales price of 27.55 florins (£4.13 sterling) in the Pisan market, while the average price for Tuscan cloths from Prato, Siena, and Pisa sold was even lower, at 20.43 florins (£3.06 sterling).[73] By the 1390s, the average market price for Florentine woollens in Pisa had risen sharply to 55.9 florins (£8.38 sterling). In that same decade, in the Spanish markets of Catalonia, Valencia, and Majorca, Prato's renowned Datini firm sold a total of 2,652 Florentine woollens at even higher prices: for an average of 64.43 florins (£9.66 sterling). For an interesting comparison we find that the Datini firm sold a mere 86 cloths from Prato and Genoa, with

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[71] See n. 47 above.

[72] See also Goldthwaite 2009, 272, contending that: 'Florentine cloth came to enjoy the distinction of being the most luxurious and costly of all'.

[73] From the accounts of the Pisan firm Baldo da Sancasciano et figli, in Melis1959, 321-65; esp. 326-327, 342-343, 347, 363-364, for Tables I, V, VI, X. For English cloth prices at Winchester and Cambridge colleges and mean export prices in the 1370s, see Munro 2009, 38-43 (Tables 1.11 - 1.13).

a mean value of only 30.78 florins (£4.62 sterling).[74]

The value of Florentine woollens sold in Syria and Egypt during these years (1390-1405) ranged from 35 to 54 florins (from £5.25 to £8.10 sterling). But they were still also the most expensive sold there, and much more expensive than fine quality woollens from the Low Countries, ranging in value from 19.20 florins (£2.84 sterling) for woollens from Wervik (Flanders) to 38.5 florins (£5.78 sterling) for woollens from Mechelen (Brabant).[75] We should note, however, that in the later fourteenth century, Florentine woollens were 40 percent longer (or more) than those from the Low Countries and England.[76] Those lower priced Florentine woollens – in the range of 35 florins – were probably Garbo woollens, which then found their chief markets in the Levant, and certainly not in the Christian realms of the western Mediterranean. It is also worth noting that in none of the Mediterranean markets – Levantine, Byzantine, or western – do any of mercantile records reveal the presence of those very cheap and light Italian serges and *saia* that had been so prominent in earlier eras (and, in this category, generally only the so-called 'Irish says').

Most Florentine woollens sold in the 1390s would have cost a master mason or carpenter then living in Florence up to or more than a year's money-wage income (for 210 days' paid employment), as is also demonstrated in Table 2.[77] Thus the least expensive, possibly the Garbo woollens, at 35.0 florins, would have

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[74] Melis 1962a, 229 (Table IV).

[75] Ashtor 1978, 303-77; Ashtor1983, 151-56, 341-66; Ashtor 1988, 227-57.

[76] See n. 41 above. According to Melis 1962a, 229, the Florentine woollens of the mid fourteenth century had a length of 18.875 *canne* (44.035 metres) compared to one of 13.333 *canne* (31.106 m) for the Flemish woollens: 1 *canna* = 4 *braccia* = 2.333 m.; 1 *braccio* = 0.583 m. In the mid sixteenth century, however, one bolt of Florentine cloth (*Arte della Lana*) measured 15.443 *canne* = 36.012 m. See Goldthwaite 2003, 527-54, esp. 553: Table A1. Furthermore, in the Low Countries during the fifteenth and sixteenth centuries, the standard length of a finished woollen cloth was even shorter, though also evidently shorter than in the fourteenth century: 30 ells = 21.00 metres; and English broadcloths of assize, fully finished, were 24 yds by 1.75 yds = 21.946 m by 1.600 m. See Munro 2003b, 314 (Table 5.7).

[77] In 1391-95, the average daily wage of a Florentine master mason was 16.84 *soldi di piccioli*; and the mean value of the gold florin was about 76 *soldi* (£3.800). See Bernocchi 1976, 79-80, 215; and Malanima 2013: Prices and Wages in Italy, 1270 - 1913 (online data set); but revised in http//:utoronto.ca/munro5/MalanimaItalyPricesWages.pdf (accessed 10 May 2013). See also Goldthwaite 1980, 436-439 (Appendix 3); and Goldthwaite 2009, 613 (Table A.1), which regrettably does not inform the reader that the mean wages are those for unskilled labourers, not those for master building craftsmen. For

cost 158 days' wages (0.75 year's money-wage income) – so that even they were hardly cheap; those in the mid range, at 56 florins, would have cost 252.73 day's wages (1.20 year's income); and the most expensive, at 64.5 florins, would have cost 291.1 days' wages (1.37 year's income).

The market for such costly woollens was therefore obviously not one composed of even skilled artisans but rather one directed at and largely restricted to the very high-income strata of European, Byzantine, and Muslim societies. That was presumably a very narrow market indeed, composed of the wealthy mercantile bourgeoisie (especially the governing urban 'patricians'), the lay aristocracy, and the uppermost echelons of the Church. If we also accept standard microeconomic theory concerning the law of supply and demand – i.e., that demand varies inversely with the price – then we must also assume that aggregate textile sales had fallen far more than had the total population.[78]

At the same time, however, the San Martino sector of the *Arte della Lana* and Florentine merchants may well have enjoyed two compensating factors in later fourteenth-century cloth markets. The first was their ability to displace from at least the Mediterranean markets a significant proportion of the rival luxury woollens still being produced in the traditional urban luxury draperies in Flanders and Brabant: those led by Ghent, Ypres, Bruges, Brussels, and Mechelen. Even if these Low Countries' draperies had managed to maintain some sales in Mediterranean markets, in contrast to the now virtually extinct Flemish *sayetteries,* they steadily lost more and more ground to the Florentines, so that, by the later fourteenth and fifteenth centuries, they became increasingly and correspondingly more and more dependent on German and Baltic markets.[79] Furthermore, the fact that the fewer and fewer northern woollens were being marketed in the Mediterranean almost exclusively by Italian and not by Flemish merchants was to the obvious benefit of the *Arte della Lana*. At the same time, and somewhat surprisingly, an entirely new type of Flemish cloths was now appearing on the Mediterranean markets, with some considerable success: those produced by rival

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comparable real wage evidence in Flanders, see Munro 2009, 27-32 (Tables 1.5-1.7).

[78] See Munro 1990, 41 - 52; Munro 1999b, 1-74.

[79] See Munro 2008, 97-182.

upstarts known as *nouvelles draperies*, from the smaller towns, which were producing lower-cost and thus cheaper imitations of the woollens produced by the older, traditional urban draperies. The aforementioned Wervik was one of the most prominent of these newcomers, as indicated above (see also Table 2).[80]

The second compensating factor for both the northern and Italian producers of luxury woollens may have been more and more highly skewed distribution of landed wealth and incomes in western Europe, following the Black Death. Indeed, many of the economic historians who support the concept of a late-medieval 'Great Depression' have contended that such an income redistribution was one of the contributing secondary causes (and/or consequences) of that supposed depression.[81] Though such a redistribution may also help to explain the general reorientation of West European export-oriented textile production towards very high value fabrics, such contentions do not provide, in this author's view, as compelling an argument for that transformation as does the aforementioned transaction-cost thesis. To the extent that any such shifts in incomes and market expenditures did indeed occur they would also have favoured the rise and expansion of the late-medieval Italian silk industry, which posed perhaps, in the longer run, the most ominous threat to the luxury woollen textile industries of Italy and those of many other countries in western Europe.[82]

In essence, the Florentine *lanaiuoli* in the *Arte della Lana*'s San Martino sector had decided to sacrifice the interests of the many for the few (i.e., themselves), in striving to maintain a still profitable existence for the necessarily smaller number of entrepreneurs and merchants engaged in luxury cloth production. In doing so, of course, they were bowing to the perceived logic of economic survival that was, at the very same time, dictating the fortunes of so many other textile towns fourteenth-century western

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[80] See Melis 1962a, 219-243; Munro 2005, 431-484. For Wervik woollens, see above nn. 29, 75.

[81] See in particular Lopez 1959, 50-63; Lopez & Miskimin 1962, 408-426; Miskimin1976, 116-163; Bois 2000; Seibt & Eberhard 1984; Van der Wee & Peeters (1970), 100-128; Munro 1983b, 235-250; and Munro 1994b, 147-195.

[82] For the silk industry, see Goldthwaite 2009, 282-296, 336-340; Muthesius 2003, 325-354; Demo 2006, 217-243; and especially Dini 1993, 91-123; Molà 2000; Molà, Mueller, & Zaniers 2000.

Europe: elsewhere in Tuscany, Lombardy, Normandy, Catalonia, the Low Countries and England.[83]

That strategy might have succeeded for most of them, had such a luxury re-orientation not required, as the *sine qua non* for commercial success, the most vital of all industrial inputs: English wools. The steeply rising prices for *exported* English wools, from the 1340s, help to explain why San Martino woollens became so very expensive by the later fourteenth century, and also, at the same time, why the much lower-cost domestic access to such fine wools allowed the English broadcloth industry to achieve ultimate victory over all its European rivals (though not until the later fifteenth century).[84]

Factors in decline of the Florentine cloth industry (3): the dependence on English wools

Thus, the third and arguably the most powerful factor determining the inevitable decline of the San Martino sector of Florence's *Arte della Lana* was its absolute, total, exclusive dependence on English wools: indeed the very finest varieties (as indicated earlier).[85] The nature of that cruel dependence, for which the evidence is overwhelming and irrefutable, was two-fold. First, as also stressed earlier, wool-fineness was the single most important determinant of both the cloth's ultra-luxury quality and its market price, for which the dyestuffs were the second most important (or equally important in the exceptional case of scarlets).[86] Second, the *Arte della Lana*'s Martino sector had no feasible substitutes for these fine English wools until the subsequent development and refinement of Spain's merino wools, which, as indicated earlier, did not finally succeed in rivalling the better quality English wools until the later sixteenth or seventeenth centuries. Even then, it was the Garbo sector, not the San Martino sector, that finally adopted the merino wools.[87]

The English crown (i.e., the king and his governing council) was certainly far from being oblivious

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[83] See in particular, Munro 2003b, 228-324; Munro 1997, 35-127; Munro 1994, 377-388; Munro 1991, 110-148.

[84] See Munro 1999b; Munro 2003b, 269-288, 292-296; see also n. 99 below.

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

[86] Munro 1978, 118-169; Munro 1983, 13-70; Munro 2003a, 181-227; Munro 2007b, 55-95; Munro 2009, 1-73.

[87] See Munro 2005, 431-84.

to that overwhelming external dependence, especially in the Low Countries, Normandy, and Italy: a dependence that it quickly exploited by imposing higher and higher taxes on wool exports. In the jargon of Economics, one might contend that the English crown took advantage of the overseas buyers' *inelastic* demand for English wool, a situation that some might compare to the contemporary French royal *gabelle* on salt consumption. That comparison is erroneous, however, because the elasticity of demand for an input – such as wool – is fundamentally derived from the demand for the final product. European demand for luxury woollens was not so inelastic – especially when Italian silks became available as important substitutes.

Nevertheless wool-export taxes did indeed become the fundamental core of English royal fiscal policies and the crown's overwhelmingly predominant source of income – partly explaining why the crown never resorted to coinage debasements before Henry VIII's Great Debasement (1542-47), by which time English fiscal policies had virtually extinguished the wool export trade.[88] One may also observe that wool-export taxes did not become the core of English fiscal policies until the 1330s: a decade marking, perhaps fortuitously, the onset of both the west-European shift to luxury textiles and of the Anglo-French Hundred Years' war (1337-1453), whose terrible and unrelenting costs vastly exceeded the fiscal capacities of the two major combatants. Thus, as already noted, the first export tax on wools, which Edward I had imposed in 1275, was quite modest: 6s 8d (80d) sterling per exported sack for both denizens and aliens, amounting to only 4.91 percent of the average value (see Table 3). Though the export taxes (collectively known as the Customs and Subsidies) rose thereafter, the denizen duty averaged only 10.337s per sack in the early 1330s (5.37 percent of the woolsack's value); but by then the alien duty had risen to an average of 14.60s per sack (9.67 percent of the value). Immediately on inaugurating the Hundred Years' War, in 1337, Edward III (r. 1327 - 1377) more than doubled those export taxes: to 26s 8d per sack for denizen exports and to 30s 0d per sack for aliens (i.e., chiefly the Italians). Thereafter, the crown and Parliament steadily increased those export taxes, so that, by 1370, they amounted to just over 50s 0d per sack for denizens and 53s 4d per sack for aliens (now including an extra 'Calais duty'). In 1399, under Richard II (r. 1377-1399), Parliament again raised the

[88] See Munro 2011, 423-476; and sources cited in n. 84 above, no. 99 below.

alien duty, to 60s 0d (£3 sterling) per sack (see Table 4).[89]

For the first quarter-century of this fiscal policy, however, the chief tax burden was not born by the foreign buyers, as originally intended, but rather by England's wool growers. When the growers found themselves forced to accept lower prices from the wool-export merchants (Table 3) , their powerful leaders in Parliament – the landed aristocracy, bishops, and archbishops in the Lords, and the wealthier gentry in the Commons – mounted protests that soon forced Edward III to find an alternative solution. In 1363, the Crown chose the recently conquered French port of Calais to be the official staple port through which all wool exports to continental Europe had to pass. To further the Crown's goal of having the export-tax burden fully passed on to foreign buyers, the leading wool-merchants were given the powers of a cartel in the form of the Company of the Staple (i.e., to fix wool export prices). Initially, the Italian merchants were also victim's of this royal Staple policy; but in 1388, Parliament granted the Italians an important exemption in return for their agreement to pay even higher export duties: licences to ship English wools directly from Southampton via the 'Straits of Marrock' (Gibraltar) to Italian ports.[90]

These export duties, both denizen and alien, were a fixed amount per sack, rather than a percentage value (*ad valorem*); and consequently, they became all the more onerous with the general deflation that beset England (and northern Europe) from the later 1370s. From the quinquenium of 1366-70 to that of 1391-95, the English consumer price index fell by 23.82 percent; the mean prices for better quality wools (those exported), having peaked at £7.895 per sack in 1371-75, then fell by 34.328 percent to a mean of £4.953 in 1391-95 (Table 3). By the late 1390s, the denizen export tax amounted to 49.21 percent of the mean value of those wools, while the higher alien export tax was 53.95 percent of that value (Table 4).[91] Even the lower denizen export duties proved to be a cruel, indeed almost fatally damaging burden for the luxury woollen

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[89] For a detailed history of the wool trade and export taxes, see Lloyd 1977, 144-256, esp. 225-256; Barnes 1918, 137-177; Ormrod 1991, 149-183; Munro1973, 38-29; Munro 2003b, 278-285.

[90] See the sources cited in n. 89; for the statute, see Great Britain, Record Commission 1810-22, vol. II, 8: statute 2 Ricardi cap. 3 (of 1378).

[91] See sources cited in n. 89 above.

draperies in the traditional towns of the southern Low Countries, in so far as one may judge from their tax farm accounts. From the quinquennial mean of 1351-55 (thus after the Black Death) to that for 1401-05, the market value of those annual drapery tax-farms fell as follows: for Ghent, by 89.00 percent; for Mechelen, by 61.82 percent; and for Leuven, by 43.91 percent.[92] While that severe industrial decline was due to a complex set of factors, internal and external, certainly the growing wool-export tax burden was a very major one. For, according to later evidence from the luxury-woollen draperies in the Low Countries, their Calais Staple wools accounted for 65 to 70 percent of their pre-finishing production costs.[93] The same may also have been true for Florence's *Arte della Lana*, whose equally severe fall in cloth outputs was specified earlier.[94]

We find much more precise evidence for the decline in aggregate English wool exports, with an even sharper decline for alien exports destined for Italy. We may now attribute this decline to both English fiscal policies, along with the Staple's cartel organization, and to the fall in aggregate demand from continental producers of luxury woollens, reflecting many other adversities as well, including Europe's post-Plague demographic crises. From the quinquennium 1361-65 to 1401-05, total English wool exports fell from an annual mean of 30,129.20 sacks to one of just 12,904.20 sacks: a decline of 57.17 percent (Table 4).[95] That, it must be noted, is much greater than most estimates for western Europe's population decline in this era. Obviously, so burdened with the much higher alien export duties, Italian merchants suffered a far greater fall in wool exports: from a mean of 9,229.25 sacks in 1361-65 to a mean of just 1,100.80 sacks in the 1401-05, so that their share of total exports fell sharply from 30.63 percent to 8.53 percent of total exports (Table 4).

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[92] See Munro 2012d, 331 (Table 26); Munro 2003b, 308-311 (Tables 5.5-5.6). The estimates for Ghent are a mean of the two sets of drapery tax farms.

[93] Munro 1977, 256 (Table 13.2: Leuven in 1434 and 1442: 76.2% and 68.8%); Munro 1983a, 52 (Table 3.12: Ypres, 1501).

[94] See above, pp. 000-00, and Table 1. We do not have similar evidence for production costs in Florence's *Arte della Lana* (let alone for the San Martino sector); but for evidence on the costs of English and other wools in Prato's cloth industry in the 1390s, see Munro 2012a, 114-115, 191-192 (Tables 6-7).

[95] For the decline of the English wool trade from the later fourteenth century, see Lloyd 1977, 257-87; Munro 1973, 1-9, 65-285.

The aftermath of the second crisis: the role of Spanish and domestic Italian wools in the Garbo sector of the Florentine cloth industry in the fifteenth century

Consequently, Florence's *Arte della Lana* would have been doomed to ruin, if not virtual extinction, had it not been able to find some alternative source of good wools. Ultimately, as indicated earlier, the Italians found that alternative in Spain's recently *merino* wools, whose origins may now be dated to the mid-fourteenth century.[96] Indeed, some Italian draperies, beginning with Milan in 1375, soon began experimenting with these wools, then known as *lane di San Matteo*, after the Maestrazgo region (Valencia, Aragon) from which they were obtained.[97] But during the later fourteenth and very early fifteenth centuries, the quality of these Spanish *San Matteo* wools was evidently still very poor, since, in the cloth industries of Milan, Florence, Verona, Prato, and Genoa, they ranked fourth or even fifth in value, after English (always the highest priced), Minorcan, Majorcan, and French (Provençal) wools.[98]

Subsequently, during the early to mid-fifteenth century, the quality of many of the *merino* wools came to be improved, so much so that in the southern Low Countries the so-called *nouvelles draperies*, having encountered new and even more onerous fiscal burdens imposed on the English wool staple in Calais, from the late 1420s, began experimenting with *merino* wools, with some considerable success, but almost always in a mixture with fine English wools. The traditional urban draperies, however, resolutely refused to experiment with Spanish wools (before the sixteenth century), fearing that doing so would seriously undermine their jealously guarded reputation for fine quality in foreign markets; and as a consequence most suffered irredeemable decay.[99]

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[96] Lopez 1953, 161-168; Philips & Philips 1997; Munro 2005, 431-484; Munro 2012a, 103-107.

[97] See Orlandi 2010, 377-384. The Catalan branch of Prato's Datini firm was one of the major Italian buyers in the 1390s; and the wools came from the region bordered by Madrid, Zaragoza, Valencia, and Tortosa. For Spanish wools in Milan, see Santoro 1968, 179 (doc. no. 10); Munro 2012a, 106.

[98] For the various price lists, see: Melis 1962, 488 (doc. no. 350: Aug. 1390); 536-537, 542, and table facing 554; Melis 1974, 241-251; Heers 1955, 192-195; Santoro 1968, 179 (doc. no. 10: 1375); Rossini & Mazzaoui 1969-70, 571-624; Origo 1963, 69-70, 74-76. See also Munro 2012a, 104-107.

[99] The new English fiscal burdens were the Calais Staple and Bullion Laws. For the *Nouvelles Draperies* and Spanish wools, see Munro 1973, 65-179; Munro 1999b, 44-45, 60-66; Munro 2003a, 186-191;

In Florence, the San Martino sector of the *Arte della Lana* similarly refused to consider the use of Spanish wools; and indeed, as already noted, their *lanaiuoli* were forbidden by guild statutes from using any but fine English wools.[100] Thus, it was the Garbo sector of the *Arte della Lana* that chose to adopt the new Spanish *merino* wools; but they and other Italian urban draperies in and through the mid-fifteenth century were initially thwarted from doing so by still unexplained obstacles in securing good quality *San Mateo* wools from Spain. As a consequence, and as temporary mid-century expedient, Florence's Garbo sector instead used domestic Italian wools, known as *matricina* wools, to produce relatively cheap woollens, exported chiefly to Levantine markets.[101]

Possibly the Garbo sector's inability to acquire reasonably good quality *merino* wools in the mid-century may have been a factor in delaying the further decline of the San Martino sector, which still maintained some respectable sales in the ultra-luxury markets. One major example was papal-dominated Rome, which had again become one of the larger and wealthier cities in Europe.[102] Thus, of the 27,210 woollens sold in Rome in the quarter-century 1471-76, almost half (13,528 = 49.72 percent) were from Florence's San Martino sector of which 5,354 (39.58 percent) were the extremely costly grain or kermes-dyed scarlets (*panni di grana*).[103] Just the same, the Garbo sector, despite its ongoing reliance on *matricana* wools, had long ago and well surpassed the San Martino sector. In the 1470s, according to Hoshino's calculations,

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Munro 2003b, 249-262, 286-290; and especially Munro 2005, 431-484.

[100] See above p. 000.

[101] These Italian wools came chiefly from the Abruzzi region: L'Aquila, Narni, Orvieto, Perugia, Terni, Veterbo. See Hoshino 1980, 210-211, 233-236, 279; Casale 2004, 551-72.

[102] See Delumeau 1975, 71-72: stating that Rome's population grew rapidly from c. 20,000 in 1450 to 55,000 in 1526-17, thus well more than doubling; and doubling again to 100,00 by 1600. See also Goldthwaite 2009, 52, 273-74; Nicholas 2003, 19 (fig. 1.3): estimating Rome's population in 1500 at 50,000; and Malanima 2013, 6 (Italian Urban Population 1300-1861 Database): estimating Rome's population at 30,000 in 1400; 55,000 in 1500; and 98,000 in 1600.

[103] Hoshino 1980, 286-287 (Tables XLII-XLIII). England and Flanders, in striking contrast, accounted for only 821 English broadcloths and 805 Flemish woollens of the total sold in Rome during this quarter-century. For scarlets, see above n. 20.

the Garbo sector then produced about two-third's of the *Arte della Lana*'s total output of 17,144 bolts a year – a significant recovery from the 1420s.[104] But the mean value of Garbo woollens exported to the Levant was then only 16.7 gold florins, compared to an average price of 31 florins for its woollens in the 1420s. Thus the much lower prices of the 1470s may reflect the inferior value of these *matricina* wools.[105]

In the very late fifteenth century, however, the fortunes of the Garbo sector suddenly experienced a very substantial improvement. First, from the 1490s, the establishment of new, direct, and Castilian dominated commercial networks with Spain had restored, and in great abundance, the supply of *merino* wools.[106] Second, by then the quality of those *merino* wools had been very substantially improved, as reflected in their much higher prices: through both sheep breeding and the improved grazing techniques of Spanish *transhumance*. As indicated earlier, however, not until the later sixteenth or early seventeenth century did such improvements finally allow the best *merino* wools to rival or even outclass the quality of England's finest wools.[107] From the 1490s to the 1560s, Spanish wools predominated in both the Florentine (Garbo) and the Venetian cloth industries, the latter having surpassed the Florentines from the 1520s. But that story – and how both finally succumbed to competition from the English cloth trade – has been told elsewhere.[108]

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[104] Hoshino 1980, 239-244: estimating 4,286 San Martino woollens (from English wools) and 12,858 Garbo woollens, from other wools (chiefly *matricina*). The same figure of 17,000 bolts for 1488 is cited in Goldthwaite 2009, 278 (Table 4.1).

[105] Hoshino 1985, 118, n. 2, and 120 (Table 1). See also Hoshino 1980, 270, citing the testimony of the Levant-based merchant Benedetto Dei: 8,000 bolts exported to Ottoman markets in 1470; 7,500 bolts in 1471; 8,000 in 1472; but only 3,300 in 1474, and 3,000 bolts in 1476.

[106] Munro 2012a, 107-114. In the 1460s, *matricina* wools, though cheap, cost more than did Spanish wools, indicating that in so far as the latter were available they were still of poor quality.

[107] See Munro 2005, 438-440, 469-472; Munro 2012a, 109-114.

[108] See Munro 2012a, 109-181; Munro 2007b, 907-962.

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Table 1. Estimated Outputs of the Florentine Woollen Cloth Industry (*Arte della Lana*) and of Florence's Population, 1300 - 1488

woollen cloth outputs: in bolts of 36 metres in length (width unknown)

Year	Villani	Hoshino	Franceschi	Goldthwaite	Population Estimates
1300	100,000	100,000			[a]110,000
1338	75,000	75,000			90,000
1352					42,250
1355-73*			49,044		
1373			30,000	30,000	60,000
1380					54,747
1381-82*			19,296	19,000	55,000
1389			16,482		
1390			10,000		
1391			13,162	13,000	
1392			12,690		
1393			14,026		
1394			13,240		
1395			13,672		
1425			9,052		
1427*		11,500	9,750	11,852	37,144
1430			10,049		
1433			8,333		
1469					40,332

Year	Villani	Hoshino	Franceschi	Goldthwaite	Population Estimates
1488		17,144		17,000	42,000

a. Population estimates for Florence in 1300 range from 90,000 to 130,000.

* indicates an annual mean estimate for the years indicated (inclusive)

Sources:

Davidsohn 1928, 225-55; Franceschi 1993; Goldthwaite 2009; Herlihy & Klapisch-Zuber 1985; Hoshino 1980; Najemy 2006; Villani (2007), vol. III, 197-202: *Libri XII - XIII,* libro XII, cap. XCIV.

Table 2. **Prices of Woollens Manufactured in Italy and sold in Italian and Other Mediterranean Markets, with Prices for Competitors' Woollens: 1338 - 1436**
sold by the piece (whole cloth of 21 - 36 metres)

with values expressed as the number of days' wages that a Florentine master mason had to spend in order to purchase one cloth

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
1338-39	**Florence**	**Florence**	woollens (Villani)	mean	16.000	2.400	62.500	7.240	138.122
			woolens (Hoshino)	mean	17.300	2.595	62.500	7.240	149.344
1354 to 1371	**Pisa**	Italy							
		Florence	San Martino	mean	43.350	6.503	68.000	15.613	188.804
		Milan, Como	good quality cloth	mean	27.550	4.133	68.000	15.613	119.990
		Prato, Pisa, Siena	medium quality cloth	mean	20.430	3.065	68.000	15.613	88.980
1390	**Pisa**	Florence	San Martino	mean	55.900	8.385	76.500	16.458	259.834
ca. 1380 to. 1400	**Naples Sicily**	**Italy**							
		Florence	San Martino	lowest	58.540	8.781	76.500	16.458	272.105
		Florence	San Martino	mean	60.740	9.111	76.500	16.458	282.331
		Florence	San Martino	highest	62.930	9.440	76.500	16.458	292.511

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
		Milan, Como	dyed woollens	lowest	40.000	6.000	76.500	16.458	185.928
		Milan, Como	dyed woollens	mean	43.360	6.504	76.500	16.458	201.546
		Milan, Como	dyed woollens	highest	45.000	6.750	76.500	16.458	209.169
		Prato, Pisa, Siena	dyed woollens	lowest	21.680	3.252	76.500	16.458	100.773
		Prato, Pisa, Siena	dyed woollens	mean	26.020	3.903	76.500	16.458	120.946
		Prato, Pisa, Siena	dyed woollens	highest	30.350	4.553	76.500	16.458	141.073
		Catalonia							
		Perpignano	dyed woollens	mean	17.000	2.550	76.500	16.458	79.019
		Villefranca	dyed woollens	mean	9.370	1.406	76.500	16.458	43.554
		France							
		Languedoc	dyed woollens	mean	16.000	2.400	76.500	16.458	74.371
		Gignac, Beziers	dyed woollens	mean	17.500	2.625	76.500	16.458	81.343
		Carcassonne	dyed woollens	mean	19.000	2.850	76.500	16.458	88.316
		Flanders							

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
		Wervik	dyed woollens	mean	26.000	3.900	76.500	16.458	120.853
ca. 1390 to 1410	**Spain: Barcelona Valencia**	**Italy**							
		Florence	dyed woollens	mean	64.430	9.665	76.500	17.260	285.567
	Majorca	Prato, Genoa	dyed woollens	mean	30.780	4.617	76.500	17.260	136.424
		Flanders							
		Wervik, Kortrijk	dyed woollens	mean	27.900	4.185	76.500	17.260	123.659
		Comines, Menin	dyed woollens	mean	27.900	4.185	76.500	17.260	123.659
		Bruges	dyed woollens	mean	44.010	6.602	76.500	17.260	195.062
		Brabant							
		Brussels	dyed woollens	mean	44.180	6.627	76.500	17.260	195.815
		Mechelen	dyed woollens	mean	44.180	6.627	76.500	17.260	195.815
		France							
		Montivilliers	dyed woollens	mean	31.480	4.722	76.500	17.260	139.526

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
		Spain							
		Perpignano	dyed woollens	lowest	10.670	1.601	76.500	17.260	47.292
		Perpignano	dyed woollens	mean	13.620	2.043	76.500	17.260	60.367
		Perpignano	dyed woollens	highest	18.670	2.801	76.500	17.260	82.749
		Puigcerda	dyed woollens	mean	10.670	1.601	76.500	17.260	47.292
		Villefranca	dyed woollens	mean	8.800	1.320	76.500	17.260	39.003
		Villefranca	dyed woollens	mean	8.400	1.260	76.500	17.260	37.231
		Barcelona	dyed woollens	mean	11.860	1.779	76.500	17.260	52.566
		England							
		Essex	straits (dozens)	mean	6.120	0.918	76.500	17.260	27.125
ca. 1390	**The Levant:**	**Italy**		**Place/Date**					
to 1402	**Alexandria**								
	Damascus	Florence	woolens lowest range	D: 1390	35.000	5.250	76.500	16.635	160.956
	Constantinople	Florence	woollens medium range	D: 1390	46.000	6.900	76.500	16.635	211.542
		Florence	woollens highest range	D: 1390	54.000	8.100	76.500	16.635	248.332
		Florence	panni di fontego	D: 1390	27.000	4.050	76.500	16.635	124.166
		Florence	woollens lowest	D: 1398	30.000	4.500	76.500	16.635	137.962

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
			range						
		Florence	woollens medium range	D: 1398	43.300	6.495	76.500	16.635	199.125
		Florence	woollens medium range	D: 1398	45.000	6.750	76.500	16.635	206.943
		Florence	woollens lowest range	A: 1400	30.000	4.500	76.500	16.635	137.962
		Florence	woollens lowest range	A: 1402	37.500	5.625	76.500	16.635	172.453
1390-1395	**The Levant:**	**Catalonia**							
		Villefranca	dyed woollens	D: 1390	16.500	2.475	76.500	16.590	76.085
		Villefranca	dyed woollens	D: 1395	14.500	2.175	76.500	16.590	66.863
		Barcelona	dyed woollens	D: 1390	15.500	2.325	76.500	16.590	71.474
		Barcelona	dyed woollens	D: 1395	12.000	1.800	76.500	16.590	55.335
		Puigcerda	dyed woollens	D: 1395	12.500	1.875	76.500	16.590	57.640
		Perpignano	woollen 'simples'	D: 1395	14.500	2.175	76.500	16.590	66.863
		Perpignano	panni alla francesca	D: 1395	17.300	2.595	76.500	16.590	79.774
1390-1395	**The Levant:**	**France**							
		Louviers	dyed woollens	A:1390	25.500	3.825	76.500	16.590	117.586
		Narbonne	dyed woollens	A: 1396	10.500	1.575	76.500	16.590	48.418
		Narbonne	dyed woollens	D: 1396	10.500	1.575	76.500	16.590	48.418

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
		Narbonne	dyed woollens	A: 1399	19.440	2.916	76.500	16.590	89.642
1395	**The Levant:**	**Flanders**							
		Wervik	dyed woollens	D: 1395	19.200	2.880	76.500	16.590	88.535
1395	**The Levant:**	**Brabant**							
		Mechelen	dyed woollens	D: 1395	38.500	5.775	76.500	16.590	177.532
1394-98	**The Levant:**	**England**				**florin/40d**			
		Norfolk or Ireland?	Saia d'Irlanda	D: 1394	4.500	0.675	76.500	16.590	20.750
		Norfolk or Ireland?	Saia d'Irlanda	D: 1395	5.300	0.795	76.500	16.590	24.439
		Norfolk or Ireland?	Saia d'Irlanda	D: 1397	6.000	0.900	76.500	16.590	27.667
		Norfolk or Ireland?	Saia d'Irlanda	D: 1398	3.550	0.533	76.500	16.590	16.370
1405-1410	**The Levant:**	**England**							
		Worcestershire	Cotswolds	D: 1405	35.000	5.250	76.500	17.820	150.253
		Worcestershire	Cotswolds	D: 1410	14.700	2.205	76.500	17.820	63.106

Dates of Sales	Places of Sales	Places of Manufacture	Textile Type or Name	Rank Order of Value	Value in Florentine Florins	Value in £ sterling 36d/florin	Value of Florin in lira di soldi piccioli	Daily Wage of Florentine Master Mason in soldi (mean)	No. Days' Wages to Buy One Cloth
1414-1416	**The Levant:**	**England**							
		West Country	Panni Bastardi	D: 1414	25.000	4.167	80.000	18.160	110.132
		West Country	Panni Bastardi	D: 1414	28.000	4.667	80.000	18.160	123.348
		West Country	Panni Bastardi	D: 1416	20.000	3.333	80.000	18.160	88.106
		Salisbury	Wiltshires	D: 1416	20.000	3.333	80.000	18.160	88.106
		Essex	straits (dozens)	D: 1416	6.000	1.000	80.000	18.160	26.432
1436	**The Levant:**	**Flanders**				**40d/florin**			
		Wervik	dyed woollens	C: 1436	28.300	4.717	83.000	19.520	120.333
		Wervik	dyed woollens	C: 1436	22.000	3.667	83.000	19.520	93.545

Sources:

Place names by initials:

A: Alexandria
C: Constantinople
D: Damascus

Sources:

Cloth Prices:

Ashtor 1978, vol. II, 303-77; Ashtor 1983, 151-156, 341-366; Ashtor 1988, 227-57; Melis 1959, 321-365; Melis 1962, vol. III , 219-43; Melis 1962, vol. I, 488 (doc. no. 350: Aug. 1390), 536-37, 542, 554; Munro 1997, 42-44 (Table 3); Munro 2003b), 318-24 (Table 5.10).

Values of the Florentine florin: Spufford 1986, 4-23; Bernocchi 1976, 84-86.

Florentine Masons' Wages (masters): Malanina 2013, *The Italian Economy*, no. 4: Wage Rates (1290-1990), as adapted by J. Munro, in: http://www.economics.utoronto.ca/munro5/StatResources.htm: MalanimaItalianPriceWages.xls

Table 3. Prices for English Wools, for Better-Quality Exported Wools, and Price Indexes for Wools, Livestock Prices, and the Phelps Brown and Hopkins Composite Price Index for Southern England
wool prices in pounds sterling per sack of 364 lb.
in quinquennial means: 1271-75 to 1446-50
price index base: mean of 1451-75 = 100

Years in 5 year means	Mean Prices per Sack All Wools	Index 1451-75 =100 £3.4917	Mean Price per Sack of Better Quality Wools*	Index 1451-75 =100 £4.8544	PB&H Livestock Index A beef, pigs mutton 1451-75 =100	PB&H Livestock Index B butter & cheese 1451-75 =100	Phelps Brown & Hopkins CPI 1451-75 =100 (Munro)
1271-75	4.887	139.97	5.061	104.251	106.889	81.694	105.733
1276-80	6.692	191.64	6.791	139.898	107.620	86.140	100.023
1281-85	5.616	160.83	5.700	117.411	103.705	79.908	105.184
1286-90	6.059	173.53	6.281	129.388	91.023	80.065	81.953
1291-95	5.107	146.26	5.402	111.284	85.490	82.300	105.375
1296-1300	5.520	158.10	5.508	113.471	101.148	79.936	100.285
1301-05	5.498	157.47	5.441	112.081	94.467	78.503	91.679
1306-10	7.063	202.27	7.006	144.320	109.551	89.608	103.728
1311-15	5.775	165.39	6.087	125.391	123.486	112.898	110.443
1316-20	6.734	192.84	7.012	144.444	132.724	119.145	154.560
1321-25	7.446	213.25	7.834	161.369	111.064	127.634	130.704
1326-30	6.211	177.88	6.649	136.964	105.950	101.686	104.712
1331-35	5.031	144.08	5.370	110.614	110.021	95.281	109.108
1336-40	4.264	122.11	4.646	95.699	96.346	94.622	89.256
1341-45	4.498	128.83	4.947	101.910	89.666	88.547	85.533
1346-50	4.222	120.91	4.713	97.093	94.572	97.299	100.064
1351-55	3.923	112.36	4.446	91.577	113.987	102.921	126.472
1356-60	4.050	116.00	5.243	108.009	108.455	112.790	118.092
1361-65	4.306	123.31	5.606	115.474	131.419	104.738	137.976
1366-70	5.624	161.08	6.689	137.799	131.607	106.830	136.460
1371-75	6.422	183.92	7.895	162.637	143.653	107.403	127.345
1376-80	6.582	188.49	7.536	155.243	118.580	105.066	109.891
1381-85	5.097	145.96	5.995	123.494	110.890	105.709	113.190
1386-90	4.111	117.74	5.071	104.463	108.055	96.590	101.233
1391-95	4.266	122.17	4.953	102.039	106.471	73.130	103.953
1396-1400	4.814	137.86	5.241	107.966	111.064	100.898	110.648
1401-05	5.065	145.05	5.702	117.455	110.071	102.790	112.653
1406-10	4.974	142.44	6.219	128.114	106.555	106.878	109.927
1411-15	5.426	155.38	5.954	122.651	105.599	110.132	108.261
1416-20	4.155	119.00	4.592	94.586	103.055	107.879	113.598
1421-25	4.205	120.42	5.269	108.538	93.213	91.331	103.740

Years in 5 year means	Mean Prices per Sack All Wools	Index 1451-75 =100 £3.4917	Mean Price per Sack of Better Quality Wools*	Index 1451-75 =100 £4.8544	PB&H Livestock Index A beef, pigs mutton 1451-75 =100	PB&H Livestock Index B butter & cheese 1451-75 =100	Phelps Brown & Hopkins CPI 1451-75 =100 (Munro)
1426-30	4.613	132.11	5.015	103.298	99.581	104.979	112.610
1431-35	4.928	141.13	5.613	115.634	106.078	106.810	109.122
1436-40	4.440	127.16	5.322	109.627	109.585	110.342	124.218
1441-45	4.188	119.93	5.201	107.145	96.624	97.290	92.574
1446-50	4.119	117.96	5.379	110.796	106.245	106.978	101.241

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

Sources:

(1) English Wool Prices: Lloyd 1973, 35-51: better quality wools, from cols. 2-5, 10-13.

(2) English Commodity Prices:

Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a. From these working papers, I constructed an entirely new index based on actual prices rather than their index numbers. I first calculated the annual prices for all the commodities in the basket for the years from 1264 to 1700. The using the Phelps Brown & Hopkings commodity weights, I calculated the sum value of those commodities, to calculate the annual value of the basket. I then constructed the price index, with their base, 1451-75 = 100, from the values of the basket for each year in that 25-year base period. These index numbers vary, sometimes considerably, from those published in: Phelps Brown & Hopkins 1956, 296-314.

Table 4. **Mean Prices of English Wools, Wool Export Taxes, and Wool Exports by Denizen (Native) and Alien Merchants, in five-year means from 1276-80 to 1446-50**

Five-Year Mean	Price of Woolsack (Better) Wools) in £ sterling*	Denizen Export Duties in shillings (20s = £)	Denizen Duty as % of Wool Price	Alien Export Duties in shillings (20s = £)	Alien Duty as % of Wool Price	Total Wool Sacks Exported	Denizen Wool Exports in sacks	Denizen percent of Total Exports	Alien Wool Exports in sacks	Alien percent of Total Exports
1276-80	6.791	6.667	4.91%	6.667	4.91%					
1281-85	5.700	6.667	5.85%	6.667	5.85%	26,897.20				
1286-90	6.281	6.667	5.31%	6.667	5.31%	26,040.80				
1291-95	5.402	14.667	13.58%	14.667	13.58%	27,919.20				
1296-1300	5.508	22.667	20.58%	22.667	20.58%	23,041.20				
13010-5	5.441	6.667	6.13%	8.667	7.96%	32,344.00				
1306-10	7.006	6.667	4.76%	10.000	7.14%	39,016.20	23,041.60	59.06%	15,974.60	40.94%
1311-15	6.087	6.667	5.48%	6.667	5.48%	35,328.60				
1316-20	7.012	8.332	5.94%	9.166	6.54%	26,084.60				
1321-25	7.834	8.000	5.11%	12.000	7.66%	25,316.03	14,074.30	55.59%	11,241.73	44.41%
1326-30	6.649	12.227	9.19%	15.560	11.70%	24,997.60	17,888.87	71.56%	7,108.73	28.44%
1331-35	5.370	10.373	9.66%	14.559	13.56%	33,645.60	24,633.00	73.21%	9,012.60	26.79%
1336-40	4.646	29.556	31.81%	41.501	44.67%	20,524.80	13,180.00	64.21%	7,344.80	35.79%
1341-45	4.947	40.247	40.68%	43.333	43.80%	18,075.58	10,565.51	58.45%	7,510.07	41.55%
1346-50	4.713	40.000	42.43%	43.333	45.97%	27,183.13				
1351-55	4.446	40.000	44.99%	43.333	48.74%	30,750.40	10,169.40	33.07%	20,581.00	66.93%
1356-60	5.243	40.000	38.14%	43.333	41.32%	32,666.40				
1361-65	5.606	44.110	39.34%	46.110	41.13%	30,129.20	20,899.95	69.37%	9,229.25	30.63%
1366-70	6.689	49.650	37.11%	50.000	37.37%	26,451.80	16,345.60	61.79%	10,106.20	38.21%
1371-75	7.895	51.584	32.67%	53.333	33.78%	25,867.80	16,712.02	64.61%	9,155.78	35.39%
1376-80	7.536	51.584	34.22%	53.333	35.38%	20,470.20	16,898.00	82.55%	3,572.20	17.45%
1381-85	5.995	51.584	43.02%	53.333	44.48%	17,517.40	13,886.80	79.27%	3,630.60	20.73%
1386-90	5.071	50.100	49.40%	52.166	51.43%	19,312.00	15,574.20	80.65%	3,737.80	19.35%
1391-95	4.953	51.414	51.90%	53.163	53.66%	18,513.80	13,593.20	73.42%	4,920.60	26.58%

Five-Year Mean	Price of Woolsack (Better) Wools) in £ sterling*	Denizen Export Duties in shillings (20s = £)	Denizen Duty as % of Wool Price	Alien Export Duties in shillings (20s = £)	Alien Duty as % of Wool Price	Total Wool Sacks Exported	Denizen Wool Exports in sacks	Denizen percent of Total Exports	Alien Wool Exports in sacks	Alien percent of Total Exports
1396-1400	5.241	51.584	49.21%	56.555	53.95%	16,889.60	14,515.80	85.95%	2,373.80	14.05%
1401-05	5.702	52.771	46.28%	61.187	53.66%	12,904.20	11,803.40	91.47%	1,100.80	8.53%
1406-10	5.759	51.584	44.78%	60.000	52.09%	14,968.20	13,392.80	89.48%	1,575.40	10.52%
1411-15	5.954	51.584	43.32%	60.000	50.39%	13,593.20	12,633.20	92.94%	960.00	7.06%
1416-20	4.592	51.584	56.17%	68.000	74.05%	14,365.00	13,355.40	92.97%	1,009.60	7.03%
1421-25	5.269	45.425	43.11%	62.658	59.46%	14,245.20	13,363.60	93.81%	881.60	6.19%
1426-30	5.015	41.584	41.46%	53.333	53.18%	13,358.60	12,429.00	93.04%	929.60	6.96%
1431-35	5.613	41.584	37.04%	57.103	50.86%	9,384.60	8,679.40	92.49%	705.20	7.51%
1436-40	5.322	41.584	39.07%	62.267	58.50%	5,378.80	4,197.80	78.04%	1,181.00	21.96%
1441-45	5.201	41.584	39.97%	63.333	60.88%	8,029.40	6,502.20	80.98%	1,527.20	19.02%
1446-50	5.379	41.584	38.66%	63.333	58.88%	9,765.20	9,176.80	93.97%	588.40	6.03%

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

Sources:

(1) English Wool Prices: Lloyd 1973, 35-51; better quality wools, from cols. 2-5, 10-13.

(2) **English Wool Export Duties** (including the Calais duty on denizen exports to Calais, from 1363): Great Britain, Public Record Office 1911-1962, vols. IV (*1327-1337*) to XXI (*1471-1485*); Great Britain, Parliament 1767-1777, vols. II - V; Barnes 1918, 137-77; Gras 1918, 76-80; Carus Wilson & Coleman 1963, 194-96; Ormrod 1991, 149-83.

(3) **English wool exports: calculated from** Carus Wilson & Coleman 1963, 13-16, 36-74.