Industrial raw materials in the import trade of Northern and Central Italy during the XVIIth Century

Domenico Sella

University of Wisconsin, Madison

The import trade is probably the one aspect of the Italian economy in the seventeenth century about which we know least – with the notable exception of textile imports from England and the Netherlands which were often blamed, in contemporary sources, as the main cause for the decline of the celebrated textile manufactures of Venice, Florence, and Milan. The main reason why so little has been written about the import trade has to do, in my own experience, with the scarcity of original sources dealing with the subject. This is all the more unfortunate because data on foreign imports would help clarify the structure of the economy in a century during which it experienced profound changes – not, however, in the sense proposed by a long historiographical tradition according to which the country suffered a process of "absolute" decline and of de-industrialization, and was turned into an impoverished, mainly agricultural land dependent on foreign sources of supply for its needs of manufactured goods. This bleak view has now been largely abandoned as new research over the past twenty years or so has brought to light the shift of manufacturing from major cities to the countryside, the emergence of new industries such as hydraulic silk mills, and the staying power of old industries such as metallurgy and firearm production in the Brescia hinterland, papermaking along the coast of Liguria, and the textile industry of Bergamo. All of which convey the picture of an economy which, while declining "relative" to the economies of northern Europe, yet showed unsuspected vitality

and resilience[1]. How were all these developments reflected in the country's import trade?

Two sets of documents – one concerning imports to the port of Leghorn in Tuscany in the early 1650s and the other concerning imports to the port of Venice in the 1680s – show, somewhat unexpectedly, that the large majority of incoming cargoes consisted of industrial raw materials (and, to a lesser extent, of foodstuffs), whereas manufactured goods were only marginally present – the very reverse of what had often been assumed in the past.

I

Consider first the case of Leghorn. By the early seventeenth century its key role as one of the three leading Italian ports with far-flung international connections was firmly established. Rising from an obscure village of some 700 souls around 1550 to a bustling city of over 10,000 by the 1620s, Leghorn had become a hub of international trade where well over one hundred large ships of many nationalities (in addition to a swarm of small boats plying the coastal trade) docked every year with cargoes that included Baltic grain, north African hides, sugar, oriental spices, dyes from the New World, English and Dutch textiles, raw wool from the Balkans and cured fish from north Atlantic waters.[2]

The data on imports presented here cover three short periods of time (specifically, 2 January-21 March 1652, 7 November-21 December 1652,

[1] The large body of literature on the subject is discussed in D. Sella, *Italy in the Seventeenth Century*, (London-New York 1997), pp. 29-49. See also M. Aymard, "La fragilitá di un'economia avanzata: l'Italia e le trasformazioni dell'economia" in R. Romano (ed.), *Storia dell'economia italiana*, vol.II, (Turin 1991), p. 86; P. Malanima, *Economia preindustriale. Mille anni: dal XI al XVIII secolo*, (Milan 1995), pp. 322-323; S. Ciriacono, "Economie urbane e industria rurale nell'Italia del Cinque e Seicento: riconversione o stagnazione?", *Rivista storica italiana*, CXIII, 1 (2001), pp.5-35. and V. Beonio-Brocchieri, *"Piazza universale di tutte le professioni del mondo". Famiglie e mestieri nel Ducato di Milano in età spagnola*, (Milan 2000), ch. 11.

[2] On the rise of Leghorn, M. Baruchello, *Livorno e il suo porto*, (Leghorn 1932) and F. Braudel and R. Romano, *Navires et marchandises à l'entrée du port de Livourne (1547-1611)*, (Paris 1951). Population figures in E. Fasano Guarini, "Esenzioni e immigrazione a Livorno tra xvi e xvii secolo" in *Atti del convegno 'Livorno e il Mediterraneo nell'età medicea'*, (Leghorn 1978), p. 62.

and 1 March-31 September 1653) for a total of about eleven months during which 165 large ships sailed into the harbour, with over half of them coming from North Africa.[3]

For each ship our source provides nationality, name of the port of departure, and a detailed list of the cargo indicating the quantity of each commodity on board. It should be pointed out that at times it is difficult to know with absolute precision the quantities involved, mainly due to the wide variety of the units of measurement then in use, for some of which a modern metric equivalent cannot be determined. Grain, for instance, is variously measured in terms of *mine, sacchi, carra, scafissi* or *cafissi, starelli*, and for the latter I know of no modern equivalent. Fortunately, however, the term *starelli* appear only once in a total of 52

TABLE 1. Ships entering the port of Leghorn, 1652-53

Provenance	Number of ships	%	Major items transported
Lybia, Tunisia, Algeria	52	31.5	grain, hides
Egypt	43	26.0	flax, hides, sugar
Turkey	16	9.7	cotton, silk, valonia, wool
Holland	12	7.3	spices,dyes, cloth, cured fish
Cyprus	7	4.2	cotton, wool, soda ash
Syria	5	3.0	cotton, valonia
Spain	5	3.0	.salt, iron, wool, hard currency
Greece	4	2.4	cheese
Portugal	4	2.4	fish, spices, sugar, tobacco
Apulia	3	1.8	grain
Sicily and Sardinia	3	1.8	cheese, tuna
Muscovy	2	1.2	caviar, fish
Ionian Islands	2	1.2	raisins
England	1	0.6	fish, lead
Hamburg	1	0.6	cod, lead, tin
Unknown	3	1.8	
	165	100	

Source: Archivio di Stato di Firenze, *Mediceo*, 2328.

[3] The number of ships entering in this eleven-month period is rather high compared to other years. V.Salvadorini, "Traffici con i paesi islamici e schiavi a Livorno nel secolo XVII: problemi e suggestioni" in *Atti del convegno 'Livorno e il Mediterraneo'*, p. 211, provides the number of ships over six separate periods between 1644 and 1656 for a total of 980 ships in 81/2 years, or 115 ships a year on average.

entries where grain is mentioned. Ignoring it, therefore, is not likely to distort significantly the total quantity of grain unloaded in Leghorn in those eleven months. And a large quantity it was indeed: 20,986 hl. or 59,597 bushels. Gauging the quantity of spices, dyes (notably indigo and brazil wood) and cured fish presents more serious problems, because the variety of measures under which they are listed (*pezzi, botti, barili, rotoli, fardi*) defies any attempt at converting them into modern equivalents. Lastly, the few references to woollen fabrics (mainly from England and Holland) are entered in the documents in terms of *pacchi* (parcels) with no way of telling how much those 'parcels' weighed.* At

TABLE 2. Raw materials and grain entering the port of Leghorn, 1652-53

a) Industrial raw materials	Number of units	Florentine lbs. per unit	Total weight in lbs.	Total weight in tons
cotton	1,923 colli	340	653,820	222.3
flax	2,898 colli	340	985,320	335.0
hides (number of)	81,801			
silk	1,274 colli	300	382,200	129.9
sugar	1,337 casse	400	534,800	534.8
sugar	1,025 sacchi	?	?	?
wool	251 sacchi	125	31,375	10.6
wool	869 balle	400	358,400	128.8
b) grain	**Number of units**	**Equivalent in hl.**	**Total in hl.**	**in bushels**
	18,037 mine	0.12	2,164	6,146
	2,967 cafissi	4.25	12,610	35,812
	926 carra	5.95	5,510	15,648
	961 sacchi	0.73	702	1,994
			20,986	59,600

Source: same as for Table 1.

Note: all modern equivalents of old measures are taken from Braudel-Romano, *Navires et merchandises à l'entrée du port de Livourne*, p. 84, except for the equivalents of the *sacco* of sugar and the *cafisso* or *scafisso* which the authors do not provide. I cannot find a modern equivalent for the *sacco* of sugar. As for *cafisso*, I have assumed, in light of the fact that the term is found only in connection with commodities coming from north Africa, that we are dealing with the Arab unit *qafiz* which, according to Paul Sebag, *Tunis au xviie siècle. Une cité barbaresque au temps de la course*, (Paris, 1989), p.191, was equal to 425 litres. A Florentine lb. is equal to 0.34 kg.

* Out of 165 ships, only six (all from Holland) carried a varying number of 'parcels' of cloth among other items.

any rate, for the purpose of this article, I have focused on six industrial raw materials (cotton, flax, hides, silk, sugar, and wool) that figure prominently in our source; the inclusion of sugar is based on the assumption that what came to Leghorn was, as will be seen in the case of Venice, unrefined sugar intended to be processed on Italian soil before reaching the consumer.

Our source provides no information on the final destination of all these imported commodities. At first glance, one might be inclined to think that most of them were goods in transit rather than being intended for the Italian hinterland: after all, it has been widely held that Leghorn's prodigious rise from obscure village to free port with an international reputation where ships and merchants from distant lands called to exchange goods or merely to replenish their stores of food and water on their long journeys across the Mediterranean, was an "exception" totally "unconnected" to an allegedly depressed and de-industrialized Italian economy.[5] And yet there are reasons for thinking that such was not the case at all and that, on the contrary, much and perhaps most of Leghorn's imports were meant for use in Italian manufactures. There is, first of all, the fact that for only seven ships out of a total of 165 did the customs official specify that all or part of their cargoes was intended for re-export. For example, when the ship *San Jacopo* arrived on 14 March 1652 from Lisbon laden with brazil wood, sugar, cinnamon, tobacco and "diverse stuffs," her cargo was registered in two separate lists one of which read "for Genoa." Likewise, next to the list of commodities (mainly cotton and valonia, the latter a key ingredient for tanning) aboard the Dutch ship *Arme di Amburgo,* which had sailed from Alexandretta (Iskanderun in Syria) and docked at Leghorn on 15 April 1653, we find the notation "for Amsterdam." In light of this, it is reasonable to conclude that, in the absence of a specific notation, most cargoes were unloaded in Leghorn.

More telling, however, is the information, however fragmentary, showing that industrial raw materials brought to Leghorn did find their way into the

[5] F. Diaz, *Il Granducato di Toscana. I Medici,* (Turin 1976), p. 397; C. Ciano, "Uno sguardo al traffico di Livorno e l'Europa del Nord verso la metà del Seicento" in *Atti del Convegno 'Livorno e il Mediterraneo"*, p. 151; Malanima, *L'economia italiana nell'età moderna,* p. 127.

hands of manufacturers in central and northern Italy. The Tuscan countryside, for instance, offered a significant outlet for imported flax as the demand for it was high in that region, especially among the local peasantry, for making coarse linen fabrics and far outstripped local supply, so much so that by the eighteenth century two million pounds had to be imported annually from Egypt via Leghorn.[6] Raw cotton, too, was in high demand in northern Italy, notably in the Gallarate area west of Milan where the making of cotton fabrics (*fustagni* and *bombasine*) still was and long remained the mainstay of the local economy[7]. As stated in a 1650 document, "the greater part of the people here are engaged in making cotton fabrics with cotton fetched from Milan, Genoa and Leghorn."[8] As for all the raw silk imported from Turkey and the dyes brought in by Dutch vessels from the New World, they were most likely intended for the still thriving silk industries of nearby Lucca[9] and Florence.[10] Much of the fine raw wool imported from Spain no doubt went to the declining, yet still not negligible Florentine cloth industry whose annual output by mid-century stood at about 5,000 cloths and required some 220 tons of the raw material[11], while the growing industry of lesser Tuscan towns, where annual production of low-grade fabrics in the 1660s reached the 10,000 mark[12], absorbed the rest in addition to wool imported overland from Apulia and the Papal State. Lastly, the huge shipments of leather reaching Leghorn found a ready market in the tanneries and leather workshops of Italy – a subject to which I will return.

[6] P. Malanima, *Il lusso dei contadini. Consumi e industrie nelle campagne toscane del Sei e Settecento*, (Bologna 1990), pp. 60 and 67.

[7] In northern Italy the cotton industry had long been established. See the definitive work on the subject by M.F. Mazzaoui, *The Italian Cotton Industry in the Later Middle Ages, 1100-1600*, (Cambridge 1981).

[8] Quoted in D. Sella, *Crisis and Continuity. The Economy of Spanish Lombardy in the Seventeenth Century*, (Cambridge, MA 1979), pp. 113-114.

[9] R. Mazzei, "I rapporti tra Lucca e Livorno nel Seicento" in R. Mazzei and T. Fanfani (eds.), *Lucca e l'Europa degli affari*, (Lucca 1990), p. 313.

[10] P. Malanima, *La decadenza di un'economia cittadina. L'industria a Firenze nei secoli xvi-xviii*, (Bologna 1982), pp. 93 and 302-304.

[11] I base this estimate on the data provided by Malanima, *La decadenza*, p. 93, indicating that about 130 Florentine lbs. (44 kg.) of wool were needed for manufacturing one cloth.

[12] J.C. Brown, "The economic 'decline' of Tuscany: the role of the rural economy" in Villa I Tatti, *Florence and Milan: Comparisons and Relations*, (Florence 1989), p. 105.

II

The two documents on Venetian imports in the early 1680s are of a different kind.

One consists of a list of all commodities that passed through the Maritime Customs Office (*Dogana da Mar*); it indicates neither the number of ships involved nor the ports they had sailed from and only in a few instances is there mention of the country from which a given commodity originated. Commodities are simply classified into two broad categories depending on whether they originated from countries east (*Levante*) or west (*Ponente*) of a line running down the length of the Adriatic Sea. Accordingly, the first category included goods coming from Dalmatia, the Balkans, the Greek archipelago, Asia Minor and Syria; the other, goods from the Italian peninsula, Sicily and Sardinia, north Africa, and western Europe. For each commodity quantity is given in terms of standardized *colli* (bales) weighing 300 Venetian pounds (about 140 kg.). The list includes 142 different commodities (ranging from spices and dyes to hides, wax, sulphur, raisins and lead, to mention but a few) for a grand total of 84,790 bales (11,870 metric tons), with the eastern trade claiming 45,390 bales and the western trade 39,400. To place these figures in perspective, we may recall that in the first decade of the century, when port activity in Venice was at its peak, the total had stood at 95,000 bales; by 1675, in the aftermath of the long Cretan war against the Ottoman empire (1645-1669), it was down to 68,000 bales; by the early eighteenth century it had reached the 110,000 mark.[13] The 1680 figure, therefore, suggests that Venetian maritime trade (at least in terms of sheer weight) was not far from the level it had known in the halcyon days of the early seventeenth century.

Turning now to the composition of the 1680 imports (Table 3) we find striking similarities with the situation in Leghorn: in Venice, too, industrial raw materials stand out and, in fact, account (in terms of sheer weight) for 65% of all imports from the Levant and nearly 78% of those

[13] D. Sella, *Commerci e industrie a Venezia nel secolo XVII*, (Venice- Rome 1961), p. 72. A similar document for the year July 1681-June 1682 in Civico Museo Correr, *Fondo Donadale Rose, f. 3*.

from the west. As in Leghorn, we might add, imported textiles are present only in small quantities (25 bales). On the other hand, two commodities figure prominently in Venice, while they do not in Leghorn, namely wax from the Balkans and lead from the west (and most likely England).

The second document, albeit limited to imports from the Dalmatian port of Ragusa (Dubrovnic) sheds further light on our subject for the years 1684-87. In those years, annual imports of leather stood, on average, at 10,525 cow hides and 211,415 Venetian pounds (nearly 100 tons) worth of *cordovani* (high-grade goat skins used for making shoe uppers); raw

TABLE 3. Raw materials entering the port of Venice, 1680 (all measured in *colli* of 300 Venetian lbs., 1 lb.= 0.47 kg.)

	number of colli	% of total	weight in tons	provenance
a) from the east (da Levante)				
Total imports	45,390		6,354	
cotton	1,016	2.2	143	Syria and Cyprus
hides	7,467	16.0	1,053	Balkans
soda ash	2,948	6.5	416	Syria and Egypt
wax	10,841	23.0	1,529	Balkans
wool	7,390	16.2	1,042	Albania, Greece,
Total raw materials	29,662	65.3	4,183	
b) from the west (da Ponente)				
Total imports	39,400	100.0	5,516	
dyes	1,905	4.8	269	
lead	12,406	31.5	1,749	likely England
sugar	14,945	37.9	2,107	
tin	153	0.4	21	
wool	1,200	3.0	169	Spain
Total raw materials	30,609	77.7	4,315	

Source: Archivio di Stato di Venezia, *Senato Mar*, filza 649, attachment to a decree of 24 November 1683, reproduced in its entirety in Sella, *Commerci e industrie a Venezia nel secolo XVII*, pp.115-116. Comparable data in a list of imports for the year July 1681-June 1682 in Civico Museo Correr, *Fondo Donà dalle Rose*, 357/3. An attached note specifies that $^1/_4$ of all imports is consumed in Venice.

Note: Although in Venice two different pounds were in use, the *libbra grossa* (0.47 kg.) for weighing such commodities as wool, iron, copper, lead, and alkali ash, and the *libbra sottile* (0.3 kg.) for weighing cotton, silk, dyes, sugar and wax, I have assumed that in this document only one kind of weight (presumably the *libbra grossa*) was intended, because the document reads : "we have reckoned and equalized (calcolato e ragguagliato) one collo at the weight of 300 pounds".

wool at 775,436 pounds (364 tons); and wax at 1,333,206 *libbre sottili* (at 0.3 kg. per lb.) or about 400 tons.[14]

As in Leghorn's case, our Venetian sources provide no information as to the final destination of these imports. There are grounds, however, for thinking that most of them ended up in Venice itself and in her mainland dominions stretching from the shores of the Adriatic to the heart of the Po Valley. As regards Venice, it is well to remember that, despite some heavy losses, the city continued to be an important manufacturing centre during the seventeenth century: even though its celebrated woollen industry had seen production plummet from an all-time high of 28,600 high-quality cloths (*panni alti)* in 1602 to a low of 3-4,000 in the 1680s, at this late date it still needed not negligible quantities of fine Spanish wool; and if we adopt for Venice the data available for Florence, namely that one high quality cloth required 44 kg. of fine Spanish wool[15], we can see that Venetian production at the time was likely to absorb most of the imported Spanish wool (1,200 bales or 160,000 kg), while the 7,390 bales of coarser varieties imported from the Balkans and from Greece no doubt found their way to the mainland where the cloth industry had greatly expanded in the course of the century and by 1687 boasted an output of 50,000 cloths of which, however, only 14% were *panni alti* probably made of fine Spanish wool, while the rest were mostly lower grade fabrics (*panni bassi*) using coarser wool[16].

Raw materials that most certainly found their main outlet in the city of St. Mark were wax, unrefined sugar, and lead. The making of candles was a Venetian industry of long standing with a reputation that went well beyond the city's boundaries: in 1622 reportedly one fourth of production had been sold in the city to the many churches and shrines as well as to the homes of the rich, the rest being exported to the mainland and abroad. The 10,841 *colli* (1,500 tons) registered in 1680 strongly suggest that the old industry was prosperous and growing.[17] And so must have been sugar refining and confectionery, another Venetian specialty: the 15,000 bales

[14] Archivio di Stato di Venezia, *V Savi alla Mercanzia, Diversorum*, busta 350.
[15] See note 11 above.
[16] Sella, *Commerci e industrie*, p. 57n.
[17] *Ibid.*, p. 57.

weighing 4.5 million Venetian pounds (2,115 tons) that were imported in 1680 compare favourably with the 4.3 million pounds imported in 1622 when nearly half of the finished product was re-exported "both to our subject cities and to Rome, Naples, Florence, Milan, Turin, and other places...".[18]

The destination of some 2,000 tons of English lead is more difficult to pinpoint, and yet can be reasonably inferred from the fact that lead was needed in at least two Venetian industries (as well as in their counterparts in the lesser towns of mainland). One was window glazing, an industry that was no doubt in great demand in a city of some 130,000 souls so rich in churches and palaces, but also a city where even modest households could afford window glass so much so that "a laudatory description of Venice boasted that every parish had its glazier"[19]. The other industry was the casting of moveable type made of an alloy of lead, tin and antimony for the printing industry – a field in which Venice had pioneered in the fifteenth century and in which it had long held a leading position in Europe. Even though this position had been gradually eroded as printing spread widely across the continent, printing remained a vital sector of the Venetian economy and, if we are to judge from the number of printers (*libreri da stampa*) registered in the city (111 in 1603 and 275 in 1690),[20] a growing one too.

III

Before concluding we must take a close look at the import of hides (mostly from north Africa[21] and the Balkans) that are so conspicuous in both Leghorn (81,800 hides) and Venice (7,500 bales or some 1,000 tons). The sheer size of those imports is impressive indeed, the more so as we

[18] Doc. quoted ibid., p 56n.

[19] F.C. Lane, *Venice. A Maritime Republic*, (Baltimore-London 1973), p 310.

[20] R.T. Rapp, *Industry and Economic Decline in Seventeenth-Century Venice*, (Cambridge, MA and London 1976), p. 60.

[21] On leather as a key export from the Maghreb and the dominant role played in its trade by Jewish merchants from Leghorn see M.H.Cherif, "Algeria, Tunisia and Libya: the Ottomans and their heirs", B.A. Ogot (ed.), *General History of Africa*, vol. V. (New York-Berkeley 1992), p.249.

know that the demand for hides was met in part from local sources, that is by animals slaughtered for their meat by local butchers. For instance, in Milan, a city of 120,000 at the turn of the sixteenth century, some 27,000 heads of cattle were slaughtered in a given year[22], and their skins were tanned in or near the city itself or further away as far as Cannobio and Chiavenna, two locations well over 100 kilometres north of Milan that were rich in lime (a key ingredient of the tanning process) before being turned into a wide variety of leather goods by specialized craftsmen. And yet, Milan itself had to import hides from Venice, Genoa, and Leghorn to meet local demand.[23] Clearly, we are dealing here with a large industry whose products held a prominent place, second only to textiles, in the limited array of manufactured goods available to early modern consumers. As a 1606 Milan document put it, leather was needed to make "scabbards, belts, coverings for horse-drawn coaches, clogs for the poor, horse harnesses, suitcases, hatboxes, shoelaces, trunk coverings, boots, shoes, and many more useful things"[24] including, we might add, expensive gilded and engraved wall coverings, a renowned Venetian specialty[25]. As a sixteenth-century English statute succinctly put it: "everie sort of people of necessitie must use and have leather"[26]. In light of this the scant attention leather making has received until recently at the hands of economic historians is rather puzzling[27].

The data on imports we now possess invites us to revisit the subject. In Leghorn's case we know that by law all imported hides had to be

[22] Sella, *Crisis and Continuity*, p. 12.

[23] E. Merlo, "La lavorazione delle pelli a Milano fra Sei e Settecento. Conflitti, strategie,dinamiche", *Quaderni Storici* 80 (1992), pp. 377 and 392n.

[24] Archivio Storico Civico di Milano, *Materie*, 737, 23 October 1606.

[25] S. Ciriacono, "Industria e commercio" in A. Tenenti and U.Tucci (eds.), *Storia diVenezia*, vol. 5, *Il Rinascimento*, (Rome 1996), p. 558.

[26] Quoted in L.A. Clarkson, *The Pre-Industrial Economy of England 1500-1750* (New York 1972), p. 172.

[27] Recent studies have now begun to fill the gap. In addition to E. Merlo's article cited above, see C. Poni, "Norms and disputes: the shoemakers' guild in 18th-century Bologna", *Past and Present* 123 (1989), pp.80-108; by the same author, "Local markets rules and practices. Three guilds in the same line of production in early modern Bologna" in S. Woolf (ed.), *Domestic Strategies: Work and Family in France and Italy 1600-1800*, (Cambridge 1991), pp.69-101; and the collection of essays in *La conceria in Italia dal Medioevo ad oggi*, (Milan 1994).

forwarded to nearby Pisa[28] where the leather industry had been in operation since medieval times[29] and was still thriving in the seventeenth century[30]. There is scattered evidence, however, to the effect that some hides ended up, legally or not, well beyond the walls of Pisa: raw hides from Leghorn show up in 1621 in Bergamo and Brescia (much to the displeasure of Venetian authorities)[31] as well as in Milan and Ancona.[32] Unlike Leghorn which served merely as a conduit for imported leather, the city of Venice offered a partial, yet substantial, outlet for it. The guilds engaged in leather work (tanners, curriers, shoe and belt makers, cobblers, scabbard makers, furriers, and craftsmen known as *coridoro* who produced expensive gilded and engraved leather) had a combined membership of 1,210 at the close of the sixteenth century and 1,294 a century later.[33] Venice, however, could not absorb all the imported hides and large quantities found their way further inland. Of the 620,000 hides imported during the first decade of the eighteenth century only 15% were absorbed by the city, while the rest were re-exported to Ancona, Verona, Brescia and Bergamo.[34]

The evidence on the import trade of Leghorn and Venice thus sheds light on the vitality not only of two major Italian commercial ports, but, more generally, on that of the economy of central and north Italy as well. It corroborates the view that, in spite of serious losses in its major cities, the country still harboured a vibrant and diversified manufacturing sector which, while catering primarily to the internal consumer market, retained strong links with the world economy to meet its needs for key industrial raw materials.

[28] Braudel-Romano, *Navires et marchandises*. p. 19.
[29] D. Herlihy, *Pisa in the Early Renaissance. A Study of Urban Growth* (New Haven 1958), p.135.
[30] R. Mazzei, *Pisa medicea. L'economia cittadina da Ferdinando I a Cosimo III* (Florence 1991), pp. 129-146.
[31] Archivio di Stato di Venezia, *V Savi alla Mercanzia, Risposte*, reg. 145, c. 109, 11 August 1621.
[32] Merlo, "La lavorazione delle pelli a Milano", p. 392n.
[34] Rapp, *Industry and Economic Decline*, pp. 58-62.
[33] A. Vianello, "La lavorazione delle pelli nei territori veneto-lombardi della Repubblica di Venezia. Premesse secentesche e sviluppi settecenteschi" in *La conceria in Italia*, p.135. A similar proportion had held a century earlier: S. Ciriacono, "Industria e commercio", p. 561. In 1609 the eighty tanneries of Brescia were reported as importing large quantities of hides from Venice as well as from Bolzano (A. Giarratana, "Brescia industriale al principio del Seicento", *Commentari dell'Ateneo di Brescia*, 1935, p. 34.)