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The limits of wool¹

Why did wool textiles, so prominent in the textile production of Western Europe, particularly Britain, in the seventeenth and eighteenth centuries, fail to become the focus of the globalisation of the textile trades during the great divergence? Why did cotton, an insignificant industry in mid eighteenth century Europe, succeed where wool did not? Was it a question of the constraints on wool supply, or were rigidities in cloth production and distribution more important? Did State policy toward wool differ from that toward cotton or were cotton cloths simply more suited to socially- and culturally-differentiated global markets? What role did merchants and consumers, as well as manufacturers, play in the relative dynamics of wool and cotton? What were the limits of wool?

We know that cotton manufacturing in Europe, in Britain in particular, benefited from the elastic and cheap transatlantic supply of slave plantation cotton and from the innovation of the Whitney gin. We know too that cotton fibres were more suited to mechanical handling, steam-powered mass production, and to colourful printing than wool. We know that Western-produced cotton cloths appealed in a range of world markets and climates that were often already used to indigenous supplies of similar fabrics. And we know that both plain and printed cottons were becoming cheaper than substitutable ranges of wool textiles, particularly as a result of increasing productivity following the innovations of the late eighteenth and early nineteenth centuries. Cottons even travelled better and more cheaply than woollens – they held less moisture and were not so susceptible to mould and moth infestation during shipment. The answer to the

¹ My thanks are due to the international group of historians gathered for one of a series of conferences on the globalisation of the cotton industry at Les Treilles, France, in March 2006 (under the auspices of the Global History Network GEHN) for their stimulating comments on this paper, particularly Larry Epstein, Patrick O'Brien, and Giorgio Riello. A shorter version, geared more to cotton and wool rivalries in the Atlantic markets, will be published in Prasannan Parsatharathi and Giorgio Riello (eds), *The Spinning*

question ‘Why cotton rather than wool?’ seems pretty straight forward, particularly with the benefit of hindsight, but is this the case?²

The success of wool

Before considering the success of cotton vis-à-vis wool it is important to emphasise that we are looking at two successful global industries of the period from the seventeenth century onwards. To use cotton as a yardstick against which wool can be judged to have failed is to mis-specify the problem and to distort our understanding of the dynamics of the textile sector as a whole. The European, and particularly the British wool textile industry continued to be extraordinarily successful between the seventeenth and the early twentieth centuries, finding markets across the globe and proving innovative and responsive to competition and to fashion changes. Processes of restructuring, regional concentration, and technological innovation allowed diversification, specialisation, and cheapening of production. If wool was not *the* global textile industry of the nineteenth century, it certainly had that role, alongside cottons and silks, in the eighteenth, and in the late nineteenth century it continued to vie with cotton as the leading global textile sector as the globalisation of cotton waned.³

World: a Global History of Cotton Textiles, 1250–1850 (Oxford: Oxford University Press, 2008) entitled ‘The limits of wool and the potential of cotton’.

² This question is perhaps easier to address than the relative success of cotton versus linen. Europe as a whole was much more geared to flax and linen production than to wool or cotton in the eighteenth century, and linen was more directly comparable with cotton in functional terms. Thus one might more reasonably ask why linen lost out (eventually) during cotton’s rise. Although that question remains outside the scope of this paper, the relative elasticity of raw cotton supply was probably a determining factor. See Leslie Clarkson, ‘The linen industry in early modern Europe’, in David Jenkins (ed.), *The Cambridge History of Western Textiles* (Cambridge: Cambridge University Press, 2003), vol. 1, pp. 473–92; Kenneth Pomeranz, ‘Political economy and ecology on the eve of industrialization: Europe, China and the global conjuncture’, *American Historical Review*, 107, 2 (2002), p. 431.

³ The global reach of the British cotton industry declined after 1870, and in France the cotton industry never exceeded the importance of the wool or silk manufactures. Douglas Farnie, ‘Cotton 1780–1914’, in David Jenkins (ed.), *The Cambridge History of Western Textiles* (Cambridge: Cambridge University Press, 2003), vol. 2, pp. 738–9. For a short statement defining ‘global industry’ in relation to cotton and wool in the nineteenth century see the *Postscript* at the end of this essay.

Wool was always a *front ranking* global industry. Even in the case of Britain, the earliest and premier seat of the industrialised success of cotton, cotton textile exports did not exceed woollen exports until the Napoleonic War period, long after the success of Western cotton relative to wool is generally assumed. Cotton exports may have grown much faster thereafter, as prices declined, but they were certainly prone to the major cyclical crises of overproduction and profit variability that characterised speculative overseas markets for mass manufactures. In Britain, and I suspect in many of the older textile centres of Europe, steadier fortunes were often made by those who invested in wool textile manufacture. The Yorkshire textile magnates of the nineteenth century left fortunes comparable to those generated in the cotton sector.⁴ Bankruptcy rates were high in both sectors but higher in cotton manufacture than in wool.⁵ In the wool textile sector of Britain and West Europe, taken as a whole, it is hard to sustain the notion of a long-term, let alone terminal, crisis of wool in the face of competition from cotton, as implied in some of the literature.⁶ Perhaps one should not expect this, as in terms of the end uses of their fabrics the two industries were only directly competitive with each other, in a small proportion of their respective ranges, rising from around 10 per cent in the early eighteenth century to perhaps 30 per cent a century later, with the development of lighter and figured worsteds. The fabrics were often not in direct competition in the Atlantic, European, and other global markets because they were used for different purposes and added to the variety of consumer goods available for different seasons and occasions. Cotton and woollen industries often boomed in unison in the 1780s because they could

⁴ See David J. Jeremy (ed.), *Dictionary of Business Biography: a Biographical Dictionary of Business Leaders Active in Britain in the Period 1860–1980* (London: Butterworths, 1984–6).

⁵ Julian Hoppit, *Risk and Failure in English Business, 1700–1800* (Cambridge, Cambridge University Press, 1987), pp. 76–8.

⁶ This is a common implication in most textbooks and, with some notable exceptions, in recent specialist literature on the cotton industry. See for example Leandro Prados de la Escosura (ed.), *Exceptionalism and Industrialisation. Britain and its European Rivals, 1688–1815* (Cambridge: Cambridge University Press, 2004), which contains nothing on wool textiles.

produce a complementary variety of styles and patterns for both luxury and mass markets.

Increasingly, cotton and wool fibres were combined in fabrics. Many manufacturers switched between cotton and wool and cotton/wool mixes in response to swings in the market, and the two industries had significant overlap. Wool often benefited from markets forged or opened up by cotton *and* vice versa, whilst technological innovation spilled over from one sector into the other – from cotton into wool, but also from wool into cotton. Cotton's gains were by no means always made at the expense of wool: there was significant complementarity as well as competition.

Wool textiles proved flexible in response to change. The sector generated an increasingly differentiated array of mass-produced products from the later seventeenth century, often lighter and cheaper than many of the earlier woollens, and more suited to design innovations in weaving and dyeing and to a range of domestic and overseas markets for both clothing and household textiles. Crucially, the industry readily adopted cotton warps, in worsted manufacture in particular. In addition, the worsted branch incorporated a wider variety of wools (including alpaca, mohair, and angora) and silk in the manufacture of fancy goods. Worsted manufacture was only a decade or so behind cotton in its take-up of Arkwright-type steam-powered spinning and in mechanised weaving from the 1840s. At first, mill spun worsted yarn was so hairy that it impeded weaving, but this problem was quickly solved by the invention and introduction of the false reed or slay around 1800. Machine-spun yarn was stronger and allowed the fly shuttle to be used extensively for the first time.⁷ The size and nature of worsted and some

⁷ For the best introduction to the woollen and worsted industries at this time see David Jenkins, 'The Western wool textile industry in the nineteenth century', in David Jenkins (ed.), *The Cambridge History of Western Textiles* (Cambridge: Cambridge University Press, 2003), vol. 2, pp. 761–89. Accounts of the Yorkshire trade are found in Herbert Heaton, *The Yorkshire Woollen and Worsted Industries from Earliest Times up to the Industrial Revolution* (2nd edn Oxford: Clarendon, 1965) and Pat Hudson, *The Genesis of Industrial Capital: a Study of the West Riding Wool Textile Industry c. 1750–1850* (Cambridge: Cambridge

woollen factories of the nineteenth century paralleled those of the cotton sector: the productivity growth and price fall of worsted yarns and cloths from horizontally specialised firms had a similar impact in extending the social and global reach of sales. In Britain and elsewhere, the longer-stapled wools used in worsted cloths became easier and cheaper to obtain not just from specialised domestic flocks, but partly also as a by-product of domestic mutton production and mutton breeds. The proportion of worsteds in wool textile output increased, accounting for some 40 per cent of output in Britain by the 1770s with a further 30 per cent in mixed woollens-worsteds.⁸ By the mid nineteenth century the delicate patterns that could be woven into worsted fabrics put them on a par with printed cottons for many purposes, particularly for dress wares. In other areas (upholstery, hangings, and carpets) there was little or no competition from cotton.⁹

At the same time woollen (as opposed to worsted) production adapted itself to serve both domestic and external markets more effectively in the eighteenth and nineteenth centuries, although (or because) it was not so directly troubled by the stiff winds of competition from cotton. Fortunes were made in military contracting in the later eighteenth century and Napoleonic War period when British firms contributed to the clothing of North American and most European armies. If slaves wore cottons and linens for working, they were supplied with woollen blankets (mostly from Yorkshire) for sleeping. Like their West European brethren, North American and Caribbean colonists and planters were as fond of woollens as cottons for outer wear.¹⁰ Innovations in cloth

University Press, 1986). For earlier detailed accounts see James A. Bischoff, *A Comprehensive History of the Woollen and Worsted Manufactures*, 2 vols (London, 1842); John James, *History of the Worsted Manufacture in England* (London, 1857; reprinted London: Frank Cass, 1968) – the false reed is described on pp. 355–6.

⁸ Estimate of Thomas Wolrich in Bischoff, *Comprehensive History*, pp. 187–9.

⁹ James, *History of the Worsted Manufacture*, p. 304.

¹⁰ Linda Baumgarten, *What Clothes Reveal: the Language of Clothing in Colonial and Federal America* (Williamsburg: The Colonial Williamsburg Foundation and Yale University Press, 2002); John Styles and Amanda Vickery (eds), *Gender, Taste and Material Culture in Britain and North America, 1700–1830* (New Haven: Yale University Press, 2006); Peter Maw, 'Anglo-American trade during the industrial

finishing at the fine end of the spectrum, in broadcloths and overcoatings, stimulated the market in fine woollen goods for both clothing and household use for the growing middling and upper classes of the Atlantic and European worlds. The fine woollen producers of the region around Aix la Chapelle and Verviers benefited particularly from this trend. At the cheaper end of the market for wool textile output, woollens (along with linens) held their own well into the nineteenth century. Woollens had advantages of occupational durability and warmth for working people, and their appeal was aided by falling prices, the result of mass production and the use of cheaper cotton yarns in mixed cloths.¹¹

The wool textile sector was buoyant and adaptable: its limits can easily be exaggerated if we focus on the successes of cotton rather than seeing the woollen industry in its own right. However, the sector did face some obstacles relative to cotton as a globally-expansive industry in the early nineteenth century, and it is important to examine their relative importance.

Wool supply

Many commentators have discussed rigidities of wool supply, in contrast with the elasticity of raw cotton production, but was it the prime determinant of cotton's success? If the cheapness of raw cotton and its efficient supply were the main drivers of cotton as a global commodity, one would have to explain how the manufacturing sector was able to respond to cheap imports of raw cotton into Europe, and why it wished to do so. The

revolution: a study of the Lancashire and Yorkshire textile industries, 1750–1825', unpublished PhD thesis, University of Manchester, 2006.

¹¹ Beverley Lemire, 'Fashion and tradition: wearing wool in England during the consumer revolution, c. 1660–1820', in G.L. Fontana and Gerard Gayot (eds), *Wool: Products and Markets (13th–20th century)* (Padua, 2004), pp. 573–94; John Styles, 'What were cottons for in the early industrial revolution', in Prasanna Parthasarathi and Giorgio Riello (eds), *Spinning World* (forthcoming); earlier version at <http://www.lse.ac.uk/collections/economicHistory/GEHN/GEHNPdf/PaduaStyles.pdf>; John Styles, 'Custom or consumption? Plebeian fashion in eighteenth-century England', in Maxine Berg and Elizabeth

technological potential of cotton as a mass manufacture and the relatively efficient forms of local and familial capital and credit supply are well known, but what was the incentive structure in terms of markets, profit margins, state support? Economic history is replete with examples where ‘the mere existence of resources does not explain the capacity to exploit them.’¹² Cheap raw material supply can be shown to have retarded mechanical innovation in other sectors and is unlikely to comprise an answer, in itself, to the question of cotton’s success.

The ease of cotton supply has been contrasted with the ecological constraints facing wool production in Britain and Europe,¹³ but calculating the acreage required for levels of wool production competitive with those of cotton supply only makes sense, as a counterfactual exercise, if the industries were directly substitutable. Moreover, such calculations tend to ignore improvements in breeding and yields over time, and they assume that domestic wool is the sole source of raw material supply to the industry. Sheep can be raised on marginal and infertile land at zero opportunity cost and they require little labour except during the clip. Therefore the elasticity of domestic wool supply during the industrial revolution was not constrained, as implied in these calculations, by an inability to double the amount of agricultural land in Britain by 1840. If Britain had required six times as many sheep as it had in 1840 for the wool textile industry to rival the amount of cotton cloth produced at that time, it would not have been impossible to arrange.¹⁴ France certainly had the underutilised grazing capacity to

Eger (eds), *Luxury in the Eighteenth Century: Debates, Desires and Delectable Goods* (London: Palgrave, 2003), pp. 103–15.

¹² Prasannan Parthasarathi, ‘The great divergence’, *Past & Present*, 176 (2002), pp. 275–93.

¹³ As attempted by Riello following a methodology explored first by Kenneth Pomeranz with respect to cotton in China: ‘A world of endless possibilities? Cotton and the ecology of textiles in the long eighteenth century’, paper presented at the Economic History Society Conference, University of Leicester, March 2005. Shorter, earlier version at

<http://www.lse.ac.uk/collections/economicHistory/GEHN/GEHNPdf/PaduaRiello.pdf>

¹⁴ Giorgio Riello, ‘The ecology of cotton in the eighteenth century: possibilities and potentials’, GEHN conference paper, University of Padua, 2005, p. 5

<http://www.lse.ac.uk/collections/economicHistory/GEHN/GEHNPdf/PaduaRiello.pdf>

respond in this way, had the incentive structure demanded it. However, it was increasingly desirable, particularly in Britain, to use readily available imported wools. Imported fine, short-stapled wools were essential for finer broadcloths and coatings, and mixes of foreign and domestic wool were preferred for many purposes. Imported wool in England came partly from Ireland – long the main source of imported agricultural produce and with much underemployed grazing land – but increasingly in the later eighteenth century the finer wools came from Spain and Germany.¹⁵

The rigidities of European wool supply were eased by superior breeding, by the global spread of merino breeds, and by the growth, especially in Britain, of a worsted industry able to make best use of the plentiful supplies of long-stapled, fine quality domestic wool.¹⁶ So plentiful were supplies of long wool that Lincolnshire growers agitated for permission to export their stockpiles in the 1780s, and Irish exports to England dropped to such an extent that the manufacture of worsted cloth in Ireland was enlarged to absorb the surplus wool there.¹⁷ Contemporaries such as James Bischoff loudly lamented the decline in quality of the British short-stapled wool clip, and agitations for repeal of the tax on imported wools were persistent in the post Napoleonic War period, eliciting Privy Council examinations of the wool supply.

Historians rarely appreciate that the temporary difficulties of the *fine* woollen trade (of Leeds and elsewhere), upon which laments and agitations focused during the post-Napoleonic Wars boom, were accompanied by a boost for worsteds.¹⁸ Some shortfalls in, and pressure on, wool supply undoubtedly occurred because of dependence

¹⁵ For the best contemporary estimates see James Bischoff, MSS Statistical Tables for the House of Lords Report, with additions c. 1834, Leeds City Library (hereafter Bischoff MSS).

¹⁶ James, *History of the Worsted Manufacture*, p. 225, quoting 'Observations on Wool and the Woollen Manufacture, by a Manufacturer of Northamptonshire' (London, second edn 1739).

¹⁷ James, *History of the Worsted Manufacture*, p. 302; Hudson, *Genesis of Industrial Capital*, pp. 110–11.

¹⁸ Examinations of Petitions before the Privy Council against the Tax on Wool Imported, H. of L. 1820 (56), XII; James A. Bischoff, 'The wool question considered' (London, 1828); Report of the Select Committee of the House of Lords on the State of the British Wool Trade with Minutes of Evidence, H. of

upon European suppliers of fine wools who were temporarily unable to respond at a time when English wools were becoming coarser. Worsted producers were largely unaffected however: not only did they have plentiful supplies of domestic long wool but improvements in wool sorting, combing, and spinning had made it increasingly possible to produce worsted with wools of a wide variety of staple lengths. Domestic growers complained about the clip lying on their hands – that they were becoming the warehousemen and stock-keepers for the industry.¹⁹ Thus wool shortages experienced by some manufacturers in the early nineteenth century did not arise from ecological constraints or a shortfall of domestic wool supply in absolute terms, but from temporary difficulties in obtaining sufficient fine wools, aggravated by taxation on their import 1800–23 (discussed below).

In the four decades up to 1820 the number of sheep in Britain had ‘vastly increased’, along with the proportion of long wool to short in the new breeds.²⁰ After this, improving domestic supplies were supplemented by increasing imports of short-stapled wools, subject only to a nominal tariff (1d in the lb) after 1824.²¹ This caused a significant lowering of wool prices. Despite the abolition of restrictions on the export of British wool in the same legislation and the exportation of an increasing proportion of the English long wool clip, wool prices did not rise significantly until the early 1830s. Although this created concern, the consternation was both modest and temporary. Mill building in Yorkshire continued apace, ‘...enough to astonish anybody’, and even the West Country was experiencing renewed growth by 1833.²² In the 1830s and 40s a

L. 1828 (515), VIII, particularly evidence of James Bischoff, merchant, London; John Sutcliffe, woolstapler, Huddersfield; John Varley, woollen manufacturer, Stanningley.

¹⁹ Report of Select Committee 1828 (515), VIII, evidence of James Fison, Thetford wool dealer; John Sutcliffe, Huddersfield woolstapler.

²⁰ James, *History of the Worsted Manufacture*, p. 299.

²¹ Hudson, *Genesis of Industrial Capital*, p. 111.

²² Bischoff, MSS; Report of the Select Committee appointed to inquire into the present state of Manufactures, Commerce and Shipping, H. of C. 1833 (690), VI, evidence of Henry Hughes, wool broker.

significant proportion of the industry's wool began to come from countries specialising in producing this primary product on the basis of comparative advantage. The development of Australian ranching and, to a lesser extent, the growth of the South American, African, and New Zealand clips during the nineteenth century ensured the expansion of the wool textile industry as a hub around which many trades revolved, with a global reach exceeding that of cottons.

Equally important in terms of the elasticity of raw material supply was the increasing production of mixed cloths incorporating cotton, linen, and silk threads. This not only increased the flexibility of the industry in the face of rises in the price of wool, or obstacles to its supply, but it had the added bonus (indeed this was often the main motivation behind the development of mixed cloths) of making the industry more adaptable to mechanical handling and to steam-powered innovation, particularly in spinning. By the 1820s cotton accounted for a large proportion of the warps used in the British wool textile sector (in woollen 'union cloths' and in a range of worsteds: flannels, baizes, and cords). The use of cotton warps with woollen wefts was hastened by the introduction of bichromate of potash – a substitute for copperas – as a mordant for dyeing, allowing animal and vegetable fibres to be dyed together with good results.²³ By 1850 almost all of Yorkshire worsteds were made with cotton warps which helped to secure the success of the industry in that county. Indeed, both domestically and in Europe the trade in cotton yarn for warps underpinned the development of horizontal specialisation in both the spinning and weaving of cotton.

By the second quarter of the nineteenth century and continuing into the twentieth century, the rigidities of raw wool supply were eased further by a growing use of skin or slipe wool and recycled wool. Skin wool accounted for around 12 per cent of British

²³ Jenkins, 'Western wool textile industry', p. 766.

wool supply by the 1830s but took off in importance in Europe as a whole with the growing interregional and international trade in sheep pelts.²⁴ At the same time, the national and international trade in rags grew to sustain some of the most successful textile regions of continental Europe, including Yorkshire, Belgium, and Northern Italy. As early as the mid 1820s many Yorkshire firms used a significant proportion of recycled wool, including imported rags. John Nussey, woollen manufacturer of Birstall and a Trustee of the Leeds White Cloth Hall, was making druggets, paddings, and calmuks in 1828 using rag wool, whilst low duffils used around 50 per cent rag wool. It was estimated that one eighth of the rags used in the region were imported, largely from Germany.²⁵ By the 1840s specialised firms depended upon shoddy and mungo (treated rags) for between 20 and 60 per cent of their raw wool supply, and by the late nineteenth century the British woollen industry was using as much recovered wool as new.²⁶ Other raw material mixes, aimed less at cost cutting at the lower end of the market than at extending the range and variety of the finest cloths, were introduced in the second quarter of the nineteenth century. Mixes of wools from mohair (as early as the 1690s), alpaca, and vicuna, and including cashmere and angora all featured in the development of lustres and fine worsteds.²⁷

Thus, in looking at the eighteenth century and certainly the mid nineteenth, it is important to consider not just the relative success of cotton versus wool or versus linen, but the fortunes of a rapidly growing range of wool textile sub-sectors attuned to global as well as to domestic market niches. They produced cloths with more than one fibre,

²⁴ *Ibid.*, pp. 768–9.

²⁵ Report of Select Committee, H. of L. 1828 (515), VIII, evidence of John Varley woollen manufacturer, Stanningley and John Nussey woollen manufacturer, Birstall; Edward Baines, 'The Woollen Manufacture of England with Special Reference to the Leeds Clothing District', Paper read before the British Association for the Advancement of Science', Leeds, 1858; published by Thomas Baines in *Yorkshire, Past and Present* (Leeds: Baines, 1875), p. 11; Bischoff MSS.

²⁶ Jenkins, 'Western wool textile industry', p. 768.

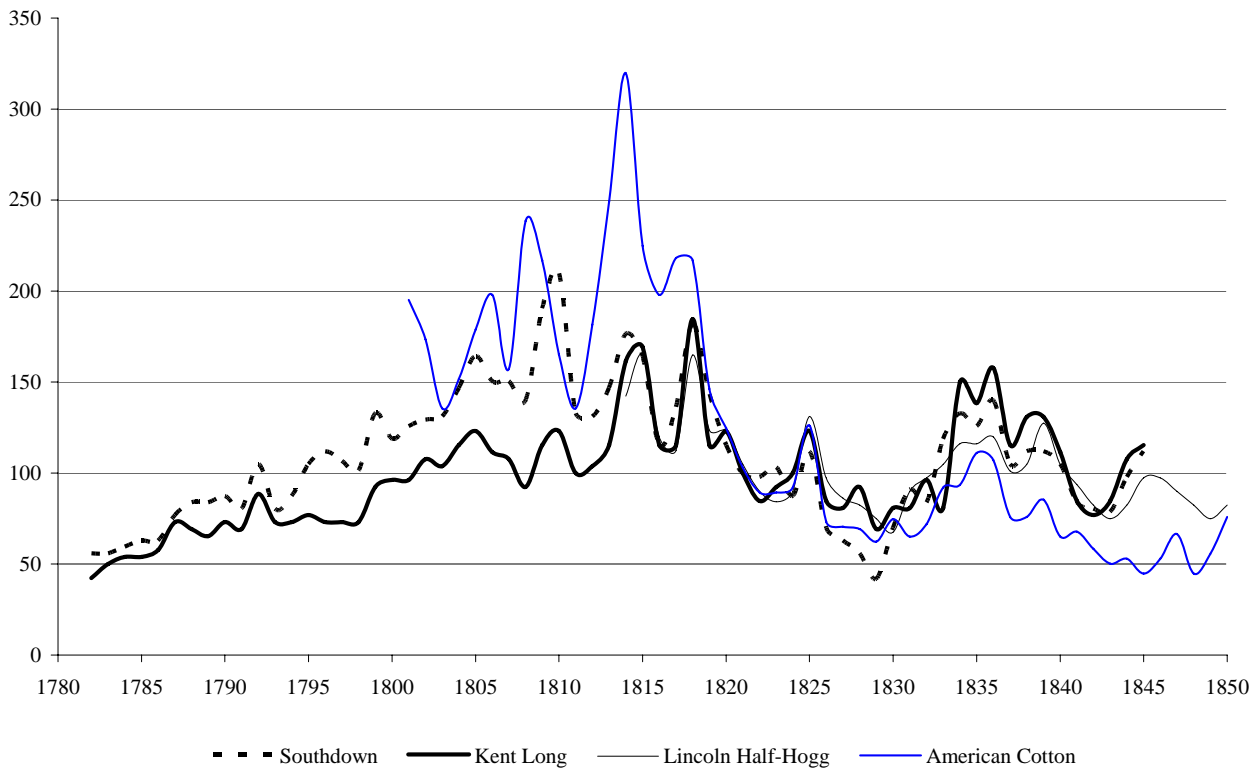
including cotton, rare wools, slipe wool, and recycled wools. If we sum up the role of recovered wool and of cotton, linen, and other fibres within the wool textile sector it is clear that by the mid nineteenth century (in Britain at least) the sector was dependent upon virgin sheep's wool (whether home-produced or imported) for less than 50 per cent of its raw material needs. Moreover, value-added was significantly higher on average in woollen and worsted production, particularly the latter (and even in linen manufacture) than in cotton. This meant that raw material supply and prices played a less important role in the fortunes of the wool textile industry than was the case in cotton.²⁸

There is no quantitative evidence supporting the notion that the British wool supply had reached its limits during the period of the rise of cotton, or even that it was under strain. Figures of the domestic wool clip show an uninterrupted rise before plateauing in the 1870s at a time when almost unlimited and superior Australasian supplies were assured, accounting for two thirds of wool imports, and amounting to twice the domestic clip.²⁹ Had the constraints of raw material supply really started to bite in the crucial decades of the late eighteenth and early nineteenth centuries when cotton was overtaking wool in Britain in output levels and exports, this would have been reflected in prices. Figure 1 shows relative indices of imported American raw cotton prices compared with wool prices represented by Lincoln half hogs and Kent long (reasonable proxies for the longer stapled wools used in worsted manufacture), and Southdown wool (the main domestic source of short stapled wool for the woollen sector). The high price of cotton during the Napoleonic War period is the most obvious feature. Less dependent upon

²⁷ James, *History of the Worsted Manufacture*, pp. 179–80; Hudson, *Genesis of Industrial Capital*, Ch. 5. John C. Malin, 'The West Riding recovered wool industry, 1813–1939', unpublished DPhil thesis, University of York, 1979.

²⁸ Although prosecuting their case, worsted manufacturers claimed in 1821 that the process of manufacture added up to fifteen times the value of the raw material compared with only two or three times in woollens and cottons. James, *History of the Worsted Manufacture*, pp. 193, 210, and 394.

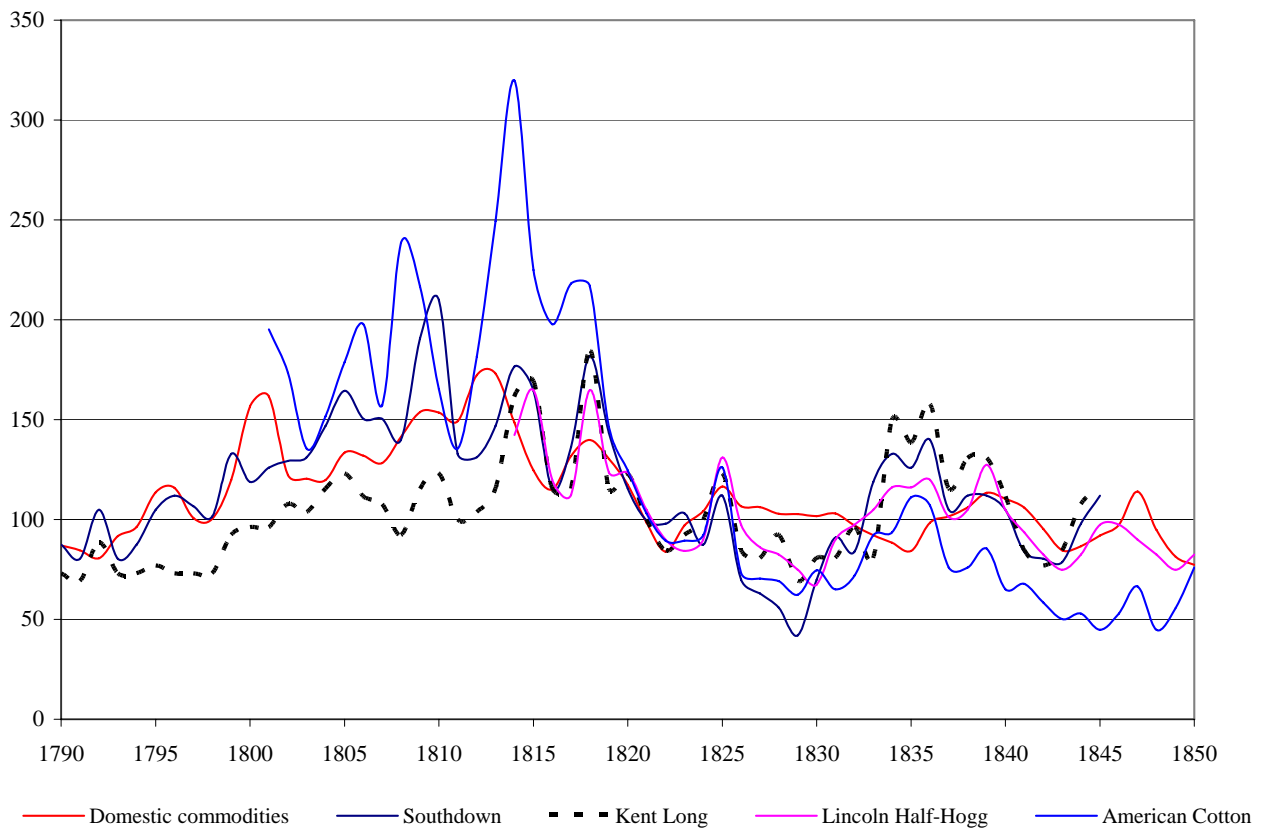
²⁹ Brian R. Mitchell, *British Historical Statistics* (Cambridge: Cambridge University Press, 1988), pp. 336–40. See also James, *History of the Worsted Manufacture*, pp. 36–9.

Figure 1 Raw Wool and Cotton Price Indices (Average 1821–25=100)

Source: Brian R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), pp. 491 and 494–5

imports, wool supply was under no such strain. There is no marked divergence between the movement of wool and cotton prices before the mid 1830s. Given the lower value-added in most cotton compared with wool textile manufacture, one might suggest that wool textile manufacture was at no great disadvantage from raw material price rises compared with cotton until the 1840s, by which time imported wools were coming to the rescue. The cost of Southdown wool in pence per lb (the shorter stapled wool most likely to feel the pinch of tight domestic supplies and limitations on imports) was markedly lower 1820 to 1845 than had been the case in the 1790s in all years bar four (1833–6). This may indicate a decline in quality and may have been both cause and consequence of a turn to mutton breeds domestically, but such prices are hardly indicative of a domestic

Figure 2 Kent Long Raw Wool and Raw Cotton Price Indices Compared with the Gayer, Rostow and Schwartz Price Index (Average 1821–25=100)



Source: Brian R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), pp. 470, 491, and 494–5

wool supply reaching its ecological limits. Further evidence of this is provided by comparing wool price indices with the domestic price index from the estimations of Gayer, Rostow, and Schwartz. Wool prices show no marked divergence from the domestic price index during the whole period to mid century – and beyond (Figure 2). If British wool was constrained in its supply, it was no more so than other domestically-produced goods.

Sheep rearing had not reached its ecological limits and the industry was insulated from the impact of stable or rising virgin wool prices by the introduction of other fibres. Raw wool prices were nevertheless three to four times higher than cotton prices per lb by the second quarter of the nineteenth century. Even allowing for the higher percentage of

waste in cotton fibres, the lower value-added in the sector (on average), and the impact of powered spinning in the success of the industry, the relatively high elasticity of raw material supply was clearly a factor in cotton's success. During the cotton famine the price differential between raw cotton and virgin wool was eliminated for several years, causing a discernible shift away from cottons to all-wool worsteds in Europe (much favouring the French industry). This gives one a taste of the market share (in the ranges of more directly substitutable fabrics) that might have been captured by wool textiles if raw wool prices had been closer to those of cotton. Wool responded to more direct price competitiveness with cotton in the 1860s by increasing production of softer mule-spun fabrics, a shift that bore fruit long term, particularly for French manufacturers who adopted mule spinning and associated design innovations to a greater degree than their British counterparts.³⁰ Raw material supply was undoubtedly one factor of several in accounting for the success of cotton, but not one with the causal primacy that has sometimes been assumed.

Import substitution industrialisation and the political economy of cotton

British woollen goods had been amongst the best and most competitive in European and world markets for over a century before cotton manufacture made a serious appearance in Europe. Practically all of the wool textiles Britain required throughout the seventeenth and eighteenth centuries were produced domestically. Cotton, by contrast, can be seen as the classic exemplar of the import substitution industrialisation (ISI) that characterised many sectors of Britain in the eighteenth century. As with the most successful examples of ISI in recent times (in South Korea, Taiwan, Hong Kong, and Singapore) vigorous import substitution policies stimulated industrial success. This resulted in turn in export-

³⁰ Jenkins, 'Western wool textile industry', pp. 773–4.

led growth as the limits of the domestic market were reached. The ISI, coupled with competitive export promotion, was underpinned in cotton in the eighteenth century by state support, tariff structures, mercantilism, militarism, and imperialism to a degree not present in more traditional industries, such as woollens, that had little competition in domestic markets and a raw material supply that was domestically based.³¹

Although the process of state protection and promotion was contingent and, to a degree, accidental – brought on by lobbying from the woollen, linen, and silk interests more than from cotton manufacturers themselves, driven at times by purely fiscal motives, and partly successful because of the need to promote political stability by protecting the Celtic linen interests – it was nevertheless a major key to cotton's success. The political economy of cotton ensured that by the 1750s and long before mechanisation, '[...] the British economy produced a greater volume of yarn, cloth, and finished textiles, manufactured wholly or partly from cotton fibres, than any other economy outside India'.³² It was this that provided the platform for later successes. The platform had been built upon international trading success, competition, and imitation, but also upon the protection of markets at home and the state promotion of markets overseas.

From the middle decades of the seventeenth century East India cotton piece goods became increasingly popular amongst English consumers, especially the upper classes and wealthy bourgeoisie, who much prized the texture, brilliance, and colourfastness of cloths, patterned wares in particular. Imported cottons, along with Chinese silks, made serious inroads into domestic markets, substituting for domestic woollens and silks in

³¹ ISI is discussed and employed as a tool of analysis in the context of eighteenth-century Britain by Joseph E. Inikori, *Africans and the Industrial Revolution in England* (Cambridge: Cambridge University Press, 2002), pp. 154–5 and 406–86.

³² Patrick K. O'Brien, Trevor Griffiths, and Philip Hunt, 'Political components of the industrial revolution: Parliament and the English cotton textile industry, 1660–1774', *Economic History Review*, 44, 3 (1991), p. 395.

household furnishing fabrics and elite dresswares.³³ The penetration of imported cottons and silk lower down the social scale was much more limited, but such was the outcry from domestic woollen, linen, and silk producers that protective action was soon taken. A law of 1701 stipulated that no imported silk goods or coloured calicoes could be worn in England and Wales. Such goods were allowed to be warehoused in Britain for re-exportation, so that white Indian calicoes could be printed in England for domestic and export markets. Thus the prohibition stimulated the growth of calico printing in Britain in the early eighteenth century. White cotton imports from India rose commensurately, increasing fourfold to over two million pieces by 1719³⁴ and creating further pressure for protection, which resulted in import duties on white calicoes plus export duties on printed calico manufactures that are estimated together to have amounted to a tax of 82 per cent *ad valorem*.³⁵

An Act of 1721 effectively closed the British market to Asian textiles: the purchase in England of all printed calicoes made from imported Indian white goods was prohibited and the printing of all-cotton British cloths was restricted, although neckcloths, muslins, and fustians were exempted. The exemption of fustians was particularly important as it allowed for the manufacture and printing of cloth made from linen warps and cotton weft. Such cloths became the mainstay of the Lancashire industry in the middle decades of the eighteenth century, provided a market for Celtic linen warps and cloths, and left the woollen and silk industries exposed to competition in the fancy and figured areas of the fustian trade – a feature endorsed in the Manchester Act of 1736

³³ Maxine Berg, *Luxury and Pleasure in Eighteenth-Century Britain* (Oxford: Oxford University Press, 2005), pp. 46–84; Beverley Lemire, 'Fashioning cottons: Asian trade, domestic industry and consumer demand', in David Jenkins (ed.), *The Cambridge History of Western Textiles* (Cambridge: Cambridge University Press, 2003), vol. 2, pp. 493–512.

³⁴ Parakunnel J. Thomas, *Mercantilism and the East India Trade: an Early Phase of the Protection Versus Free Trade Controversy* (London: Frank Cass, 1926), pp. 125 and 162; quoted by Inikori, *Africans and the Industrial Revolution*, p. 432.

³⁵ Thomas, *Mercantilism and the East India Trade*, pp. 125–6.

which further promoted fustians.³⁶ Thus, although this piece of mercantilism was designed primarily to protect the woollen and silk sectors and had been introduced partly in response to pressure from those quarters, it was the fustian industry (and later the cotton industry) that benefited most. Wadsworth and Mann place particular stress upon the role of the 1721 tariff in providing the incentive for English producers to mass-produce plain white cloths at a satisfactory and uniform standard for the calico-printing sector.³⁷

The evidence of retained raw cotton imports suggests a doubling of cotton manufacture in Britain in the period 1711 to 1760. By the 1750s this used an average of 2.76 million lbs of cotton per year.³⁸ This was not a spectacular growth and probably did little more than replace Indian white cloths³⁹ but it was the springboard from which the success in exports was launched. By the mid 1770s ‘political imperatives no longer required the conciliation of Celtic linen interests’⁴⁰ and in 1774 manufacturers were freed to make and finish all-cotton cloths for the domestic and export markets. By this time the mechanisation of spinning had also started to reduce the cotton industry’s dependence upon linen warps, creating enormous potential in the elasticity of production. However, cotton remained an insignificant consumption sector in Britain throughout much of the eighteenth century, suggesting that domestic demand for cottons was limited. This is borne out by evidence from court records and poor law accounts. Even with the abolition of restrictions on all cotton cloths, the preference in the mass domestic market – even by the third quarter of the century – was for linens, fustians, and wool textiles. Only at the

³⁶ O’Brien *et al.*, ‘Political components’, p. 409.

³⁷ Alfred P. Wadsworth and Julia de L. Mann, *The Cotton Trade and Industrial Lancashire, 1600–1780* (Manchester: Manchester University Press, 1931), p. 144.

³⁸ Brian R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), p. 177.

³⁹ A fact borne out by evidence from Old Bailey court records and poor law accounts: John Styles, ‘What were cottons for’, *passim*.

⁴⁰ O’Brien *et al.*, ‘Political components’, p. 412.

upper end of the market for figured cottons and expensive dresswares did cottons succeed over linen and cotton mixes in domestic markets before the end of the eighteenth century.⁴¹

Thus the major growth of cotton, when it came, was focused upon exports. Export markets, with political support, grew quicker than any domestic market would have been capable of doing, particularly in the absence of increasing real incomes for wage earners before the second quarter of the nineteenth century.⁴² By the time that cotton overtook woollens in Britain as an export commodity just after 1800, exports provided over 60 per cent of the market for British manufactured cottons: 'In the case of cottons there is abundant evidence that the need to out-produce Indian textiles ... [in export markets] ... propelled the innovative activities of British cotton producers, and there is much to suggest that the manufacturers themselves saw their activities in this light'.⁴³ Design and product innovation was driven, for example, by the need for British manufacturers to substitute their wares for Indian checks and printed calicoes that found favour in exchange for slaves in the African seaboard and that later penetrated the transatlantic markets. In the third quarter of the eighteenth century cotton checks accounted for around two thirds of English cotton exports and these went largely to West Africa and to the American slave plantations.⁴⁴ The Manchester calico printing sector that mushroomed at the end of the eighteenth century built its success upon conscious copying of the colours and designs of Indian competitors. If the pressures of global competition were an important impetus for European industrialisation,⁴⁵ then cotton manufacturers were much

⁴¹ Styles, 'What were cottons for'; for extended analysis see John Styles, *The Dress of the People: Everyday Fashion in Eighteenth-Century England* (London and New York: Yale University Press, 2007), *passim*.

⁴² Charles H. Feinstein, 'Pessimism perpetuated. Real wages and the standard of living in Britain during the industrial revolution', *Journal of Economic History*, 58, 3 (1998), pp. 625–58.

⁴³ Parthasarathi, 'Great divergence', p. 288. See also Lemire, 'Fashioning cottons', *passim*; Wadsworth and de L. Mann, *Cotton Trade*, pp. 116–44.

⁴⁴ Inikori, *Africans and the Industrial Revolution*, p. 435.

⁴⁵ Parthasarathi, 'Great divergence', p. 298.

more exposed to this, including in their domestic markets, than their counterparts in wool: 'Born out of trade in Asian cloth, English cottons grew up with an in-built sensitivity to the demands of the metropolitan and cosmopolitan markets.'⁴⁶ This resulted in a drive to imitate, the need to protect domestic markets, and a desire to expand exports in competition with Asian cloths. New growth theory emphasises the importance of comparative market size as cause rather than effect of industrial transition.⁴⁷ Given cotton's export success relative to wool even before the favourable impact of spinning innovations on cloth prices became fully apparent, the dynamic of combining import substitution with aggressive export promotion must be considered a vital ingredient in the success of the sector.⁴⁸

The political economy of wool

The context of state regulation and promotion of the wool textile industry in Britain was very different from that of cotton, because British woollen cloths were already superior in domestic and many global markets before the eighteenth century. By the 1770s not only did wool textiles dominate the home market, alongside linens, but huge export success had been achieved such that around two thirds of woollen output and four fifths of worsteds were exported.⁴⁹ However, the state-promoted pattern of import substitution and aggressive expansion of overseas markets was by no means irrelevant for wool, because loss of domestic markets for all fabrics was the feared outcome of allowing substitutable imports. Wool manufacturers were prominent in lobbying for protection

⁴⁶ O'Brien *et al.*, 'Political components', p. 413.

⁴⁷ Nicholas F.R. Crafts, 'Exogenous or endogenous growth? The industrial revolution reconsidered', *Journal of Economic History*, 55, 4 (1995), p. 745.

⁴⁸ The stress placed upon the importance of political economy in the success of cotton in O'Brien *et al.*, 'Political components' is assessed in relation to inventive activity by James Thomson in 'Invention in the industrial revolution: the case of cotton', in de la Escosura (ed.), *Exceptionalism and Industrialisation*, pp. 127–44. For a chronology of price fall in cotton cloths see C. Knick Harley, 'Cotton textile prices and the industrial revolution', *Economic History Review*, 51, 1 (1998), pp. 49–83.

⁴⁹ Estimates of Thomas Wolrich, quoted in Bischoff, *Comprehensive History*, pp. 187–9.

against imported cloths and shared the benefits of military involvement in the extension of overseas markets. The most important difference in the political economy of wool – not present in the pattern of lobbying, regulation, and state support in favour of cotton – is that there was often conflict between wool textile manufacturing interests and domestic wool growers, the latter strongly identified with the landed interest in Parliament. The Select Committee Report of 1806 commented in understated terms that there had been in the eighteenth century a ‘Class of Laws which bear some traces of a jealousy of the Manufacturing in favour of the Landed interest of the Country’.⁵⁰

It would be easy to suggest that the political economy of wool textiles, the much lower impact of ISI, and the strength of the wool growers’ lobby made state policy less favourable to wool textile manufacturing interests than to cotton, and that this helps to explain cotton’s relative success. However, the picture is more complex, not least because the wool manufacturers’ lobby was strong and successful in the eighteenth century and was supported by the growers over matters where they also stood to gain. In addition, policy making regarding both sectors was driven by revenue raising and broader political considerations, and European protectionism was generally stronger against wool textiles than against cottons, restricting the effective use of tariffs without fear of retribution. Furthermore, the impact of taxes and tariffs was felt unevenly across the varied wool textile sector (the interests of woollen as opposed to worsted manufacturers was a major cleavage).⁵¹ Finally, as we have seen, the cotton, linen, and woollen industries were to a degree interdependent rather than in competition, both economically and politically.

⁵⁰ Report of the Select Committee on the Woollen Manufacture of England with Minutes of Evidence, H. of C. 1806 (268), III, p. 5.

⁵¹ Broadly speaking, producers of woollens, especially broadcloths never felt much threatened by imported calicoes as the latter competed much more closely with worsteds. Worsteds producers feared the export of English long wools to rivals whilst the home supply of long wools was adequate for their needs. Woollen producers, by contrast, were ever fearful of the shortage of suitable wools by the later eighteenth century, in the absence of free imports of short stapled fibres.

The 1666 statute requiring all to be buried in wool was a signal that the State recognised the importance of the industry to the national psyche, as well as the chronic failure of exports at this time, but despite provisions introduced in 1678 for policing the statute it was not strongly enforced. The outcry against the influx of East Indian stuffs in the 1680s and 1690s came largely from the lobbyists of the wool textile industry, and wool growers, and efforts to prohibit, to substitute, and to emulate were made across the textile sector. It was widely understood that East India wrought silks were ‘chiefly to the prejudice of the woollen manufacture: for then the better sort of women scorned them, and they were mostly used instead of serges, tammies and Norwich stuffs. [...] the growth of several years’ wool lay to moth-eat till the invention of silk and worsted crapes gave new life to the wool and silk manufactures, and rendered the Indian silks and stuffs contemptible to all sorts of people’.⁵² Thus the 1701 ban on importing all Asian silks and stuffs and coloured calicoes was universally approved across the textile sector.⁵³

From 1700 the wool textile sector was liberated by the repeal of all earlier duties payable on the export of woollen cloth. Ensuing increases in sales to the Levant in particular had a double benefit in allowing the purchase of mohair for the fashionable camblets, cloaks, and gowns produced by the worsted industry. Yet protectionism for wool textiles in Europe was strong, stronger than for cotton, because of the established wool textile manufactures on the continent. Although favourable access to the Portuguese market was secured by the Methuen Treaty of 1703 and remained in place until 1831, the French market faced tariffs of between 20 and 30 per cent following the Treaty of Utrecht in 1713. In 1774 the linen manufacturers of Ireland and Scotland agitated for duties on imported linen from Germany and Russia, but this was opposed by woollen manufacturers because of fears of tit-for-tat increases in duties (already high) on all

⁵² ‘England’s Advocate in a Letter to a Member of the House of Commons’, 1699, pp. 5 and 11.

British textiles imported into those countries.⁵⁴ To a greater degree than in cotton, dependence upon European markets and European protectionism restricted the degree to which tariffs and regulation could be used to assist wool textile manufacture in Britain.

On the supply side of the industry, a ban on the export of English wool had been in place since the mid seventeenth century, and the Act of Union in 1707 closed the door to illicit English wool exports via Scotland. Despite these measures, the early eighteenth century was marked by complaints and petitions about the extent and ease of smuggling raw wool out of the country and the disastrous impact this had on the raw material costs of manufacturing. It led to domestic shortages and also resulted in supplies of English combing wool reaching European competitors, particularly the French, more easily.⁵⁵ In 1703 petitions arose from Leeds, Halifax, and Wakefield about the decay of the cloth trade, but in these and increasingly thereafter there appeared a split between those parts of that county, and the country, that specialised in superfine woollens and therefore needed a better supply of short stapled superfine wool and those manufacturing worsteds and coarse woollen cloths for whom the domestic supply of long stapled wool was more than adequate, providing it was not illegally exported to rivals.

The Worsted Committee (primarily established to prevent frauds and embezzlement, and representative of manufacturers in all areas) provided an important collective lobby on various aspects of trade. It petitioned successfully against the freedom to export English wool in the 1780s (being demanded by the growers' lobby), arguing,

⁵³ 'An Act for more effectually employing the Poor by encouraging the manufactures of this kingdom', 11 & 12, William III, discussed in James, *History of the Worsted Manufacture*, p. 181.

⁵⁴ James, *History of the Worsted Manufacture*, pp. 203–5.

⁵⁵ See for example, 'Observations on Wool and Woollen Manufacture, by a Manufacturer of Northamptonshire' (London, second edn 1739); 'A Short Account of the State of our Woollen Manufactures, from the Peace of Ryswick, (1697) to this time, (1739) their former flourishing and their present ruinous condition, shewing that they always flourished when France could not get our wool, but declined in proportion to the quantities of our wool exported' (London 1739); 'The consequences of Trade, &c., and of the Woollen Trade in particular, by a Draper of London' (London, 1740). 'A short Essay upon Trade in general &c., by a Lover of his Country and the Constitution of Great Britain' (London, 1741); James, *History of the Worsted Manufacture*, pp. 210–11, 225, and 231.

not so much that this would create a shortage of English wools for the home trade, but that it would promote rival manufacturing on the continent. It won the day and secured a punitive regime to prevent illegal exportation of raw wool and yarns (heavy fines, forfeits, and solitary imprisonment). Such a triumph for the manufacturing interest was met with the ringing of bells in Leeds, Bradford, Halifax, and Wakefield, as well as bonfires and 'other demonstrations of joy'.⁵⁶ Similarly, the worsted lobby was strong in its opposition to allowing Ireland to import English wool and export its cloth manufactures following the Act of Union in 1800. It was the loss of English long wools that was feared and the advantage that this would give to Irish manufacturers of serges and stuffs. On this occasion the English manufacturers were unsuccessful, but the Worsted Committee continued its strong lobbying against the illegal export of worsted wools and yarns, especially to Portugal and Germany, and against the threatened imposition of soap duties in 1802.

England began to import wool from around 1770. In 1800 a duty of 5s 3d a cwt was levied on the import, which was raised to 6s 8d per cwt in 1813 and to an excessive 6d in the lb in 1819. This hike reflected both the power of growers and the revenue needs of the State and was opposed by all branches of the wool textile industry. It impacted most severely on the price of short wools for the woollen cloth trade, but worsted manufacturers also opposed it because European manufacturers could now obtain their wool on very favourable terms, enabling them to extend their markets in America and in Russia.⁵⁷ Despite the concerted efforts of manufacturers to get the duty repealed this was strongly opposed by the growers. By 1821 lobbying on both sides was so fierce that the Government was forced to act to address both sets of interests. It intimated that the tax would be repealed but only if English wool exports were allowed. This split the lobby

⁵⁶ James, *History of the Worsted Manufacture*, p. 305.

and removed immediate pressure, because short wool manufacturers were unconcerned about what happened to surplus stocks of English combing wool whilst worsted manufacturers feared that allowing the export of long wools would give a fillip to continental competition in stuff manufacture. The 1824 Bill lowered the tax on imported wool to 3d per lb and allowed the legal export of English wool (after a lapse of almost 200 years) subject to a duty of 2d per lb and yarn subject to a 16 per cent duty – ‘[...] a strong instance of the influence of the agricultural interest in the Councils of the nation, and their determination to use it for what they believed to be their own benefit.’⁵⁸

It could be argued that just when cotton was triumphing vis-à-vis wool, the agricultural interest won out in allowing the export of English wool, seriously disrupting raw material supply to the industry, providing English long wools to rivals, and hampering the wool textile sector’s ability to compete. However, the *quid pro quo* was cheaper raw wool imports: shortage of imported wool had long been recognised as an obstacle to the growth of the industry and to its export success, because mixes of domestic and foreign wool were a prerequisite to achieving the quality and ranges of cloth demanded.⁵⁹ Moreover, there is little evidence that fears of long wool shortage were realised or that continental rivals were buoyed decisively by the easier supply of English combing wool. Wool prices did not rise in the wake of 1824. In fact short wools saw a 50 per cent or more reduction by 1827, following a flood of imports, and prices were not restored to their pre 1823 level until around 1833 with increased demand for short staples on the continent.⁶⁰ By this time improvements in machinery, particularly in combing

⁵⁷ Examinations of Petitions before the Privy Council against the Tax on Wool Imported, H. of L. 1820 (56), XII; H. of L. 1828 (515), VIII, evidence of John Sutcliffe, woolstapler, Huddersfield

⁵⁸ James, *History of the Worsted Manufacture*, p. 399.

⁵⁹ H. of L. 1828 (515), VIII, *passim*, in particular the evidence of John Brooke and James Varley. Import duties on wool were removed entirely in 1844.

⁶⁰ H. of C. 1833 (690), VI, especially evidence of Henry Hughes, wool broker.

machinery, allowed cheaper, shorter staples to be used even in worsted manufacture.⁶¹

By the 1840s the availability of Australian wools and the development of merino and other shorter wool used in worsteds came to the rescue on the supply side of the industry.

It is likely that the complex, sometimes unintended, consequences of policy on the wool trade were not so injurious for the wool textile sector as contemporaries feared, and as some historians have assumed, despite the extent of illegal exports and the ability of the growers' lobby to impose considerable restrictions upon imports of wool for a crucial period. The worsted sector benefited from an easy supply of English long wool throughout the period, making the cost structure of that sector rather more favourable and dynamic than that of woollens for several decades, and enabling the sector to compete well at the interface with cottons in the Napoleonic War period and its aftermath. Fine woollens suffered more but gained greatly from the near-free trade in wool after 1823.

Markets and prices

As indicated above, cottons and woollens were rarely in direct competition in terms either of price or substitutability. Their different fabrics were used for various purposes by different groups in the population, and as product markets became more differentiated so too did the range of niches into which specialist cloths of all kinds could fit.⁶² Cotton was perhaps better able than wool to fit with some of the developing sensibilities of the market for more individualised needs (through variety of colour and pattern) and with the demands for greater hygiene that came with growing sophistication in manners and

⁶¹ H. of L. 1828 (515), VIII, evidence of John Brooke; James, *History of the Worsted Manufacture*, p. 399.

⁶² For an idea of the varieties of worsteds and worsted mixes in production for different markets and consumers as early as 1739 see 'Observations on Wool and Woollen Manufacture, by a Manufacturer of Northamptonshire' (London, second edn 1739), analysed by James, *History of the Worsted Manufacture*, pp. 225–31 and 362–5.

entertainment.⁶³ In late eighteenth century sources cotton appears to have been a very successful fabric in clothing and furnishing in its decorated forms, both printed and woven, where it had a distinct technical advantage over wool. Its success appears to have depended more upon its superior properties than on its cheapness. In the 1770s Assize data show little difference in price between gowns made of cotton and those made of silk, whilst linen and worsted gowns were half to two thirds of the price. Old Bailey theft data show that in fabric for shirtings, cotton was slow to capture even 10 per cent or so of the market from linens in the course of the eighteenth century and barely appears to have made an inroad into the market for sheeting. As reflected in overseers' accounts, the poor appear to have depended almost entirely on coarse linens, woollens, and worsteds until well into the nineteenth century.⁶⁴ Thus British price and domestic market data suggest that cotton had a restricted penetration in the eighteenth century beyond the sphere of high-class and high-priced figured calicoes and woven checks. In mass markets for lower goods and for the everyday wear of the working population woollens, worsteds, and linens held their own.⁶⁵

Why was cotton so much more successful in export markets? Clearly its ability to mimic indigenous patterns and colours in West Africa and Asia was important, and it substituted more easily for domestic manufactures in many global markets where indigenous production was cotton-based. It was successful not because it was competing with wool textiles or even linens, but because it was promoted in export markets in

⁶³ Daniel Roche, *The Culture of Clothing. Dress and Fashion in the 'ancien regime'* (Cambridge: Cambridge University Press, 1994), pp. 44–63 and 503–19; Norbert Elias, *The Civilizing Process* (2nd English edn Oxford: Oxford University Press, 1994) pp. 60–160; Woodruff D. Smith, *Consumption and the Making of Respectability, 1600–1800* (New York and London: Routledge, 2002), *passim*; Styles, *Dress of the People*, Ch. 3; T. Breen, 'The meaning of things: interpreting the consumer economy in the eighteenth century', in J. Brewer and Roy Porter (eds), *Consumption and the World of Goods* (London: Routledge, 1993) pp. 249–60.

⁶⁴ Styles, 'What were cottons for?'; for extended analysis see Styles, *Dress of the People*, *passim*.

⁶⁵ As late as 1828 it was a matter of remark that agricultural workers in Lancashire and Yorkshire were now wearing cheap and durable cords and velveteens that were cotton and wool mix: H. of L. 1828 (515), VIII, evidence of Henry Hughes, p. 54.

competition with indigenous cloths that it had consciously emulated. Here prices were important. Thanks to the work of Cuenca Esteban and ensuing debates between Esteban and others, principally C. Knick Harley, we now know much more about cotton piece goods prices than hitherto. In 1994 Esteban calculated that the price of cotton cloth fell dramatically – by around one third between 1770 and 1801, and by 50 per cent more by 1815.⁶⁶ Harley's more modest estimates of the price fall for a range of counts of wefts and warps, especially of the coarser cloths and of cotton/linen mixes, based upon price data provided by American importers, suggest that the decline was much less significant. Initially it was only warp yarns and superfine calicos that were affected significantly as these felt the impact of mechanised spinning most directly. Common calico prices were roughly stable to the end of the eighteenth century and declined much less sharply thereafter. It was only in the 1820s and 1830s, with the mechanisation of weaving, that coarser cloth prices saw marked decline.⁶⁷ Assuming Harley's estimates to be more accurate than Esteban's, how much did wool textile prices need to fall to compete with cotton in mass markets for everyday textiles in the crucial early decades of the nineteenth century? How big was the price gap in the substitutable ranges of goods for the mass market?

Data collected by Harley from the records of American importers can be supplemented with additional price data from 81 importing firms considered by Maw.⁶⁸ Maw's data shows first and foremost the great variability of types and prices of wool textiles, mixes, and cotton fabrics (as well as linens and silks) in transatlantic trade, suggesting that competitiveness in variety, function, and fashion was as important, if not more important, than price competition between the two sectors. Nevertheless by the

⁶⁶ J. Cuenca Esteban, 'British textile prices, 1770–1831: are British growth rates worth revising once again?', *Economic History Review*, 47, 1 (1994), pp. 66–105; 'Further evidence of falling prices of cotton cloth, 1768–1816', *Economic History Review*, 48, 1 (1995), pp. 145–50.

⁶⁷ Harley, 'Cotton textile prices', pp. 55–8.

1820s prices for many of the wool textile and worsted ranges were some 50 per cent or so cheaper than they had been prior to the Napoleonic War period. The cheapest fustians and checks in importers' hands were half the price of low worsteds in the last third of the eighteenth century, but many cotton cloths, such as sattinets, velverettes, and quilts were of similar price to the middle ranges of Yorkshire worsteds. By the first quarter of the nineteenth century prints and muslins were slightly cheaper per piece than middling worsteds. High order woollen goods were two or three times more expensive than analogous cottons, but were nevertheless represented in considerable quantities. There is no evidence that they were being priced out of the market by cottons. Cotton shirtings, sheetings, and checks were the cheapest fabrics by piece and by yardage, but these had no easy equivalent in wool; neither did cotton handkerchiefs, which were stocked in great variety and wide price ranges.⁶⁹

It is difficult to compare price data directly for different fabrics by yard or by piece, because of different widths and lengths, and also because of wide varieties in thickness and weight, as well as purpose. Outside of narrow overlaps between coarse cottons and low worsteds, and between patterned cloths in cotton and worsted at the upper end of the market for household furnishings, there is a lack of comparability of the cloths. However, the data is suggestive of two things: first, that competition between cotton and wool textiles was not simply or even largely a question of price, and second, that the price differentials of substitutable cloths was not marked before the 1830s.⁷⁰

If price only provides a limited part of the explanation for the rise of cottons over wool textiles before the 1830s, perhaps we should focus upon markets and market

⁶⁸ Maw, 'Anglo-American trade', pp. 196–202 and 224–308.

⁶⁹ *Ibid.*, pp. 131–202 and 224–308.

⁷⁰ A point borne out by the absence of comment about price competition between cottons and woollens in the contemporary literature before the second quarter of the nineteenth century. For an early passing remark '...cotton has had a great influence on *lower* English cloths...' (my italics) see H. of L. 1828 (515), VIII, evidence of James Hubbard, woolstapler, Leeds, p. 200.

institutions. One might argue simply that cottons were suited to a wider range of climatic conditions than wool. Certainly in tropical and subtropical markets cottons had an edge, though there were many niche markets for woollens, such as with fine blue Says for the Guinea coast, scarlet cloths for Turkish turbans, and black fine Says and shalloons for Catholic southern Europe, ‘worn by friars Jesuits priests and old nuns with the like these sorts of base better than broad cloth because it being slender they can lap it about them and comes in cheap.’⁷¹ Markets for British and European textiles were found as often in temperate and highly seasonal regions as in Mediterranean or tropical ones, thus broad white camlets suited Mandarin China for winter robes and camlets dyed in the yarn were sold for winter wear in northern Europe at a time when they were being superseded by tammies and wildbores as the main dress for ‘the lower classes of females’ in England.⁷² Glazed tammies were also in great demand on the continent in the 1790s. Wool textiles had an advantage over cottons in their range from petticoats, stockings, and shoe coverings, through dress goods to outer garments and cloaks for cold climates, and in carpeting and upholstery fabrics. It is with justification that Defoe had pronounced:

Nothing can answer all the ends of dress but good English broadcloth, fine camlets, druggets, serges and such like; these they must have, and with these none but England can supply them; be their country hot or cold, torrid or frigid, ’tis the same thing, near the equinox or near the pole, the English woollen manufacture clothes them all; here it covers them warm from the freezing breath of the Northern Bear, and there it shades them and keeps them cool from the scorching beams of a perpendicular sun. Let no man wonder that the woollen

⁷¹ John Smail (ed.), *Woollen Manufacturing in Yorkshire. The Memorandum Books of John Brearley, Cloth Frizzer at Wakefield, 1758–1762* (Woodbridge: Boydell Press and Yorkshire Archaeological Society, 2001), p. 116; for niche markets for wool textiles see also James, *History of the Worsted Manufacture*, p. 362.

⁷² James, *History of the Worsted Manufacture*, pp. 309–10 and 380 quoting Senex in the *East Anglian Newspaper*, 21 Feb. 1832 and Henry Hall ‘Reminiscences of the worsted manufacture by an octogenarian’, c. 1850.

manufacture of England is arrived to such a magnitude, when in a word it may be said to cloathe the world.⁷³

The meteoric rise of cotton involved multiple innovations in marketing and the finance of trade as much as in mechanisation and product specialisation. One might expect the new entrepreneurial dynasties in cotton to have been less fettered by traditional, entrenched marketing and credit practices than those in wool, but there is little evidence to support this.⁷⁴ At first sight a good illustration would seem to be provided by the role of London factors in the wool textile trade of the eighteenth century. They appear to have flourished at the expense of more direct trade between manufacturers and their clients that might have matched commodities to the needs of distant markets better. Bowen has shown that the East India Company relied largely upon Blackwell Hall Factors in their late eighteenth century attempts to find woollen cloths suitable for the Asian market. The tender system used by the Company in dealing with the London factors made it vulnerable to combinations of suppliers who could control the price.⁷⁵ As Yorkshire manufacturers and merchants were increasingly bypassing these factors by the later eighteenth century, the Company tended to deal, via Blackwell Hall, in cloths from West Country and Norwich suppliers, who were not the most competitive – particularly in the sorts of textiles that might have competed in price and weight with native Indian producers. As long as the Company's dealings with Blackwell Factors comprised a near monopoly it was difficult for Yorkshire manufactures to be accepted in this trade.⁷⁶

European woollen cloth appears not to have been in great demand in India however. In 1773 it was revealed that over £400,000 worth of woollen cloth was lying

⁷³ D. Defoe, *A Plan of the English Commerce* (1728), p. 190, quoted by Eric Kerridge, *Textile Manufactures in Early Modern England* (Manchester: Manchester University Press, 1985), p. 225.

⁷⁴ Wadsworth and de L. Mann, *Cotton Trade*, pp. 224–77; Hudson, *Genesis of Industrial Capital*, pp. 155–81; Maw, 'Anglo-American trade', pp. 224–308.

⁷⁵ Huw V. Bowen, *The Business of Empire: the East India Company and Imperial Britain, 1756–1833* (Cambridge: Cambridge University Press, 2006), p. 256.

unsold in Indian warehouses.⁷⁷ China was regarded as a better prospect and Company exports of long ells and worsteds to China increased threefold in the early 1790s; but considerable losses seem to have been made by the East India Company in both these trades. After 1814 the Company decided that woollens represented such a risk of loss that exports to both India and China declined steeply thereafter. There is no evidence that private or contraband traders fared much better, although the bulk of trade was done this way, particularly via American merchants and at somewhat lower prices. This suggests that merchanting structures and monopolies may not have been the crucial obstacle to exporting success of wool in East Asia.

In the late 1780s the East India Company despatched samples from Halifax, Manchester, and Norwich to Calcutta, where the authorities were asked to assess whether such cloths could be sold ‘without interfering with or proving injurious to the interests of the native manufacturers whom we conceive ourselves likewise bound to protect to the utmost of our power.’⁷⁸ In the eyes of the Company wool textiles represented a conflict of interests between the policy of promoting the ‘National object’ and the fear of undermining the native economy and its buoyancy as a tax base. This may well have been more important than the conservatism and cost of relying upon Blackwell Hall Factors in explaining the company’s limited success with wool in India.

As early as the 1780s much of the export trade in wool textiles, especially from Yorkshire, was being conducted not through London but via merchants resident in the producing regions and it is certainly difficult to argue that there were any major differences in the marketing and associated financial and credit practices of British cotton

⁷⁶ John Smail, *Merchants, Markets and Manufacture. The English Wool Textile Industry in the Eighteenth Century* (Houndmills: Macmillan; New York: St Martins, 1999), pp. 38–9.

⁷⁷ Bowen, *Business of Empire*, p. 246; also Huw V. Bowen, ‘Sinews of trade and empire: the supply of commodity exports to the East India company during the late eighteenth century’, *Economic History Review*, 55, 3 (2002), pp. 466–86.

⁷⁸ Directors to Bengal, 12 April 1786, quoted in Bowen, *Business of Empire*, p. 249.

and wool textile cloths by the end of the Napoleonic War period. Success for both sectors was based upon non-metropolitan networks of northern manufacturers and merchants and their counterparts in the Americas and elsewhere. The same merchants often handled both cottons and wool textiles. Both trades were characterised by similar trends, for example that towards British merchants exporting at their own risk and experimenting with the auction system in low cloths. Both were able to take advantage of the extension of credit via national and international bills of exchange negotiated through the London as well as provincial capital and credit markets. Maintenance of close links between merchanting and manufacturing was important in adapting production to suit varied markets, and both cotton and wool textile networks proved themselves adept in this.⁷⁹

Conclusion

The brief of this paper was to discuss the limits of wool, in relation to the success of cotton, as a global industry in the period of Britain's industrialisation. The outcome of the exercise has been to emphasise the distortions created by using cotton as a yardstick against which to mark the 'failings' of the wool textile sector: there is no evidence to suggest that wool textiles were in crisis, that their markets were being undermined, or that the limits to wool supply were in danger of being reached. British cotton benefited disproportionately from the ISI and from export promotion that characterised the fiscal military state. Though protectionism was contingent and focused on promoting woollens, silks, and Celtic linens, it was cotton that benefited most from having felt the wind of Asian competitiveness that provoked the desire to supplant Asian calicos in domestic and export markets.

⁷⁹ Hudson, *Genesis of Industrial Capital*, pp. 155–81; Smail, *Merchants, Markets and Manufacture*, *passim*; Maw, 'Anglo-American trade', pp. 224–308.

The British wool textile sector was less attuned to ISI than cotton and had a different political economy. There was no switch from protected domestic markets to promoted export markets to parallel that in cotton. Difficulties in fine wool supply were in evidence in the post Napoleonic War period when the growers' lobby was strongest. This may have been crucial in giving cotton a fillip in Britain at the expense of wool, and was certainly important in hastening the incorporation of cotton warps in worsted and in seeing some transfer of activity out of wool and into worsteds and cottons. It is debatable, however, whether the obstacles to raw material supply in wool were any more important than those for cotton in the early nineteenth century. Near-free trade in wool (both exports and imports) from 1824 onwards can be seen to have benefited the manufacturing interests as much as it benefited growers.

The wool textile sector was flexible and innovative, seeking to produce new ranges of cloth to fit markets at all levels. It did well in the bulk of ranges that avoided direct competition with cotton cloths and held its own throughout much of the eighteenth century in many ranges where it did compete with cotton. Profit rates and risk levels were no more testing in woollen manufacture than in cotton.⁸⁰ The mechanisation of spinning and weaving was necessarily somewhat slower in wool textiles because of the nature of the fibre, but extensive use of cotton warps and expansion of the worsted and mixed sectors ensured a high degree of mechanisation and price competitiveness. If cotton was the first industry with global reach, this was attained alongside wool, and not primarily, or significantly, at the expense of the older-established sector.

⁸⁰ Hudson, *Genesis of Industrial Capital*, pp. 235–45; Hoppit, *Risk and Failure*, pp. 76–8.

Postscript

A note on the definition of 'a global commodity' and the short lived nature of the global commodity that was cotton.

A global commodity can be defined as one in which the bulk of consumption takes place in regions and countries other than, and distant from, where it is produced. If cotton was the first global industry then its key position in this respect was short-lived. Increasingly by the 1860s cotton cloths were produced in the national markets that they served. By the 1870s, after a spectacular recovery from the cotton famine, British cotton cloth exports entered a long climacteric, caused by international competition – particularly from Europe and India and later from China and especially Japan – from which they never recovered. Britain's share of world cotton cloth production dropped from a peak of 32 per cent in the early 1870s to less than 12 per cent just before World War I, during a period in which world output had grown fivefold. By the interwar period Britain's share was under 5 per cent. As European and North American markets sheltered behind tariffs in the later nineteenth century, market expansion was focused upon Asia and Latin America. India became Britain's main market from 1843 to 1939 and China ranked second 1869–1926. The growing importance of Asian markets encouraged the spinning of coarser counts and the manufacture of cheaper unfinished cloths for export; but India was a serious competitor as well as the main market for English cottons. Indian fine and patterned cloths outstripped British ones in both Indian and external markets even before Indian export duties were removed in 1882. The Bombay cotton spinning industry benefited from this tariff relief in particular, and Indian yarn exports to China expanded thereafter at the expense of British, which 'undermined the whole position of the British cotton industry in the world market', dependent as it was so significantly on yarn exports.⁸¹ The success of cotton as a globally-traded industry was short-lived and confined to the few decades of Britain's hegemony. (The nature of the world cotton industry since the mid twentieth century represents a new phase of globalism, resting on different foundations.) A much smaller proportion of world cotton cloth production was traded internationally by the last quarter of the nineteenth century than during the brief period of 'free trade' when cotton was king. At the same time the global nature of wool was enhanced by increasingly long-distance trade in raw materials and by the specialisation of regional production in Europe for niche markets around the world.

⁸¹ Farnie, 'Cotton, 1780–1914', p. 749.

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Pat Hudson is Professor of Economic and Social History at Cardiff University.