Scottish, Irish, and Imperial Connections: Parliament, the three Kingdoms, and the mechanization of cotton spinning in eighteenth-century Britain:

This paper offers a new perspective on the emergence of machinery in the cotton spinning trade during the third quarter of the eighteenth century. It does so by examining the interplay between economic, political and national interests within the early-Hanoverian state. Changes in trading relationships between textile producers across the three kingdoms of England/Wales, Ireland, and Scotland created escalating supply-side problems, which, by the 1760s, would precipitate a quest for solutions based on new technologies.
Among competing interpretations of the First Industrial Revolution, whether as a process of unbalanced growth, propelled by a few, technologically dynamic sectors, or as a more broadly based and incremental sequence of change, the primacy of cotton textiles as the paradigm example of precocious mechanization remains uncontested. Narratives continue to acknowledge the fundamental discontinuity that occurred in the spinning of cotton yarn in the second half of the eighteenth century. Within two or three decades from the 1760s, a process long-established in a confined proto-industrial region in the north-west of England, small in scale and domestic in character, was re-structured along factory lines, employing machinery of increasing size and complexity. That transformation has long been recognized as one of the key episodes in technological and industrial history, not merely for Britain but for the world economy as a whole. Despite this, our understanding of why machinery emerged in that industry, in that region, and at that time remains seriously incomplete. This is, in part, a consequence of the frustratingly thin documentation surrounding the appearance of the key innovations, compounded by confusing claim and counter-claim concerning their original authorship, and a paucity of knowledge about the processes of technological development and diffusion. Confronted by the enduring challenge of explaining technological breakthroughs in this and other industries, economic historians have aspired to move beyond accounts focusing on the lives of ‘heroic inventors’, which satisfied their Victorian predecessors, to offer in their place theoretically plausible models or effectively contextualized historical narratives. Yet, in accounting for the ‘wave of gadgets’ in general that came on stream in the
Industrial Revolution or for the mechanization of cotton spinning in particular, none has proved wholly satisfactory.

Our previous papers on this theme have concluded that the data required to ‘test’ any of the theories of technological change proposed by economists, in particular evidence on commodity prices, wages, firms, outputs, and workforces, do not exist in either primary or secondary sources. So, for all its inherent plausibility, there is no body of wage data that might enable us to validate or invalidate the proposition, popular among generations of textbook writers, that increasing rewards to particular groups of workers stimulated attempts to develop and diffuse labour-saving production techniques in the cotton industry. Furthermore, in the absence of business records of firms undergoing the transition from domestic to factory forms of organization, it becomes impossible systematically to investigate hypotheses, inspired by both Marxist and New Institutional Economics, that the quest for novel methods of production followed and was conditional upon the emergence of new industrial structures. It has, however, proved possible to mobilize evidence of patented and non-patented inventions to test one frequently cited explanation of change: that based on a crude version of the challenge and response theory, whereby innovation was targeted to overcoming productivity imbalances and hence incipient or actual production bottlenecks up or down stream. At all points, the model was found to be wanting. It proved unable accurately to predict shifts in the direction of textile invention over the eighteenth century, nor could it account adequately for differences in the rate of diffusion through the period. Specifically, the unusually rapid take up of spinning inventions remains, by this approach at least, inexplicable.

Like most demand-led theories of invention, the challenge and response hypothesis embodies a truism, that innovation is a response to a perceived need. Yet
the origins of that need and the process by which demand pressures became so great as to generate novel methods of production remain unspecified. One attempt to resolve such problems, at least for cotton textiles, is outlined in Joseph Inikori’s seminal work on Africa and the Industrial Revolution. Here, the key force for change is seen to be growth in Britain’s Atlantic commerce around the middle decades of the eighteenth century. As a proportion of a growing volume of British-produced exports to Africa, cotton textiles increased from 2% in the 1740s to over 28% a decade later.\textsuperscript{x}

The timing of this growth provides, so Inikori argues, a suggestive link with the wave of textile innovations under consideration here. What is more, export growth followed a period of expansion in home markets brought about by the need to substitute for fashionable goods hitherto imported from India and China. The consolidation of a viable home manufacture thus preceded and provided a necessary foundation for expansion overseas. The impetus to innovation, by this argument, was supplied by ‘a growth in aggregate demand’ for cotton fabrics.\textsuperscript{xi} While such a perspective has undoubted value in enabling us to chart shifts in the range and quality of goods being produced,\textsuperscript{xii} its capacity to explain the particular sequence of process innovation under consideration here is less certain. If growing demand for cotton cloth spurred innovation, then the pressure to mechanize weaving might be expected to be at least the equal of that to alter spinning techniques. In the absence of compelling evidence for a productivity imbalance between weavers and spinners, a more broad-based sequence of invention might be anticipated from a rightward shift in the demand curve for cotton cloth. Yet from the 1760s to the end of the century, mechanical innovation remained, Edmund Cartwright’s isolated experiments in powered weaving apart, substantially centred on one phase of the production process, suggesting that what pressures were felt were specific to the spinning of yarn.
In place of any overarching ‘theory’, therefore, greater insight may be found in examining the contingent circumstances surrounding the emergence of ‘macro-inventions’. Such a perspective has informed our previous attempts to explain the appearance and take up of innovations in cotton textiles in Britain from the flying shuttle of John Kay to the self-acting mule of Richard Roberts. One strand of this research has utilized biographical information to examine the characteristics of macro-inventors and the context within which their prototypes were designed and developed. The other, of which this paper is an extension, is concerned more with the legal and political framework within which economic activity was conducted. This legislative context facilitated growth in the volume and variety of cloth output to the extent that a search for mechanical solutions to problems of production became feasible and, from the 1760s, essential. Two (or three if amendments to Elizabethan patent law are included) distinguishable bodies of Parliamentary legislation are pertinent here. One, explored in an earlier article, comprised a sequence of commercial regulation concerned to alleviate the threat of competition from imports of cheap and high quality cottons and silks from Asia, the effect of which was to secure a growing share of home and imperial markets for native producers.

This paper is primarily concerned with a second, and related, body of law: that concerned to regulate and encourage production of a variety of textiles across the three kingdoms of England/Wales, Scotland, and Ireland. This policy, pursued through Parliament and via semi-official agencies, such as the Trustees of Hempen and Flaxen Manufactures of Ireland (established 1711) and the Commissioners and Trustees for the Improvement of Fisheries and Manufactures in Scotland (established 1727), although informed by a broad mercantilist desire to maximize employment, was for the most part ad hoc in nature and involved mediating between conflicting
interest groups, rather than the pursuit of fixed, clearly defined national objectives. On occasion, therefore, the strength of lobbying by particular interests could overcome government objectives. Such occurred in 1699, when Parliament, against the wishes of Crown and ministers, voted to prohibit the export beyond the British Isles of Irish woollen goods. By contrast, instances of the opposite, where dynastic considerations won out over local and regional concerns, were rare, although in the wake of the ’45, Parliament opted to reduce support for Scottish linen exports in favour of encouraging industry and employment in the Highlands, thereby, it was hoped, blunting the allure of Jacobite sentiment. If legislation did not emerge in a clear and ordered fashion, it had a fundamental influence on the trading relationships between three textile-producing regions: Ulster, lowland Scotland, and south-central Lancashire. For the latter in particular, trading links which had long provided opportunities for growth had, by mid-century, become a source of recurrent supply-side pressures which would generate and sustain the search for mechanical solutions. In positing a connection between an evolving body of Parliamentary legislation and early attempts to mechanize the spinning process, this paper seeks to identify a further missing political component in the complex of factors giving rise to this central episode in the First Industrial Revolution.

I

The links binding Lancashire to textile interests in Scotland and, more especially, Ireland were of long standing. In the mid-sixteenth century, John Leland had observed a significant and, by implication, well established trade in Irish linen yarn through Liverpool, destined for cloth manufacturing districts in and around Manchester. Duties on flax and linen yarn exports imposed by the Irish government in 1569 threatened to check this trade, but proved transitory in effect. The quantity of
linen yarn shipped through Liverpool and Chester continued to grow through the later sixteenth century. One hundred years after Leland’s observations, Lewis Roberts, in his ‘Treasure of Traffike’ of 1641, remained impressed by the enterprise shown by those active in this trade.\textsuperscript{xx} By the second decade of the eighteenth century, some 700 ships were reported to be engaged in traffic between Ireland and the north-west of England, shipping 13,597 cwt of yarn each year.\textsuperscript{xxi} At this point, the trade in Scottish yarn was, by comparison, modest. After an initial surge in the early seventeenth century, export volumes had tailed off. A new peak was attained as expansion was resumed later in the century, but this (170,000 lbs. per annum in the last decade prior to parliamentary union) was still barely 10\% of the contemporaneous Irish figure.\textsuperscript{xxii}

By the 1730s, it appeared that a more significant traffic in yarn was developing, as linen manufacturers in the west of Scotland noted sizeable purchases of coarse yarns by merchants from Manchester.\textsuperscript{xxiii} Trade data indicate a steady strengthening of Lancastrian-Scots/Irish links. Yet the growth in volume recorded also conceals important changes in the nature of those ties over time.

For at least 200 years to 1750, Lancashire was engaged in processing material imported in ready-spun form from outside the county. In the early part of that period, at least in the case of Ireland, much of this yarn was then exported back to the country of origin in the form of cloth. This exchange was observed by Roberts in the mid-seventeenth century: ‘The towne of Manchester…buy[s] the Yarne of the Irish, in great quantity, and weaving it returne[s] the same againe in Linen, into Ireland to sell’.\textsuperscript{xxiv} It rested crucially on the absence of a significant cloth manufacturing capacity in Ireland.\textsuperscript{xxv} From the early seventeenth century, however, attempts were made to remedy that deficiency. Strafford, as Lord-Deputy in the 1630s, and Ormonde, Lord-Lieutenant from 1661, worked to promote the manufacture of linen
cloth in Ireland, through the import of skilled workers and high-quality raw materials from the Continent. Their efforts were furthered through the offer of prizes for flax cultivation and for the weaving of cloth. The work of the Dublin administration was endorsed by English woollen manufacturers, anxious to see Ireland develop an industrial capability that would complement rather than compete with that in England. A twin gain was envisaged: a flourishing linen industry would operate to pacify Ireland, reducing the influence of what one pamphleteer described as her ‘turbulent Gentry and their priests’, while stemming the drain of bullion to France and Holland caused by English purchases of linen. All this could be achieved, according to William Temple, ‘without crossing any interest of trade in England’. In this, however, Temple was unduly optimistic. As another pamphleteer warned in 1691, any encouragement offered to cloth production across Ireland threatened the established trade in ‘Fustians, Tapes, and Manchester-ware, much of which are made by the Linen Yarn of Ireland’. For Lancashire, the limits to complementarity were all too apparent, and would become more so as the eighteenth century progressed.

Indeed, by the 1750s, the expansion in the production of linen cloth across both Ireland and Scotland was producing clear strains in the trading relationship with Lancashire. Legislation, which had as one aim the securing of economic prosperity and thus political stability across both Ireland and Scotland, was key to this outcome. So, semi-official agencies, based in Dublin and Edinburgh, sought from 1711 and 1727 respectively to sponsor improvements designed to extend the capacity and improve the quality of linen production, both of yarn and cloth, in their respective countries. Their efforts were assisted, in large degree, by a favourable framework of Parliamentary legislation. Acts passed in 1700 and 1721 to prohibit the domestic consumption of East Indian calicoes, first in their finished and then in their white
state, encouraged the use of linen as a substitute fabric in fashionable cloths. The Act of 1700 facilitated a rapid increase in the annual yardage of linen subject to the excise on printed goods, from 649,000 in 1712-13 to 1.2 million in 1718-19. More explicitly geared to promoting Irish manufacturing interests in particular were measures introduced in 1696, which granted Irish linen cloth free entry to England, and 1705, which extended that right to Plantations markets. The latter concession was made in the explicit belief that ‘the Protestant Interest in her Majesty’s Kingdom of Ireland ought to be supported’. The narrower economic gains anticipated from this measure proved slow to accrue, however, a fact which Irish and Scottish interests attributed to the drawback allowed on European linens re-exported to the Plantations from British ports, said to be the equivalent of 6% to 7% of the price of the final article. Calls for the removal of the drawback were resisted in 1738. Although Parliament accepted the argument that ‘several national Advantages’ would accrue from the provision of additional support, a primary constraint remained the fear of encouraging retaliation against English manufactured exports (especially woollens) to Europe. When the Commons agreed to act, therefore, rather than removing the drawback, they offered a subsidy or bounty on linen cloth exports. Introduced in 1742 at the rate of 1d per yard on linens valued at up to 1s a yard, the bounty, which it should be noted extended to English linen producers also, promoted the manufacture of coarse linen cloths in imitation of imported German Osnaburgs (soon to be renamed ‘Edinburgs’ in a fit of patriotic enthusiasm by the Scottish Trustees). Practical experience soon exposed deficiencies in operation of the bounty. The requirement that applications for reimbursement be made at the port from which the cloth was shipped was especially burdensome for Irish manufacturers, whose goods were exported through English and Scottish ports. The campaign to remove the
drawback was thus renewed in February 1744. Once more, Parliament remained more sensitive to the concerns of woollen manufacturers as to the likely effects of such a measure on trade with Europe and opted instead to extend the bounty to linen cloth valued at up to 1s 6d a yard. To consolidate the effect of this additional support, the Irish Linen Board offered premiums for the production of cloths deemed suitable for Plantations markets.

The encouragement offered by this combination of public agency and parliamentary enactments drew a ready response from manufacturers in both Scotland and Ireland. The result was a marked expansion in cloth and yarn output in both kingdoms. Irish cloth exports increased five-fold in the first decade of the eighteenth century (305,160 to 1,688,574 yards), while growth of more than half was reported in the 1720s (2,520,701 to 4,136,203 yards). Finally, in the first five years under the bounty as fixed in 1745, exports surged by over one-third compared to the average over the previous quinquennium (6,727,361 to 9,173,604 yards). In Scotland, a similar magnitude of increase in the volume of linen cloth stamped for sale, as recorded by the Board of Trustees, was registered in the 1740s. The absence of figures of comparable detail on the quantity of yarn marketed across Scotland precludes a more rounded assessment of production trends north of the border. Nevertheless, that yarn retained, and may even have augmented, its importance in the total output mix, is suggested by repeated concern voiced in letters to the Scottish Trustees regarding the export of yarn to Ireland and the claim, made in the 1750s, that ‘near half the yarn Spun in Scotland for Sale is carried to England’.

In Ireland, a fundamental shift in the composition of linen exports had occurred by mid-century. Although yarn shipments continued to grow in volume, their rate of growth lagged markedly behind that for cloth. Comparing the
quinquennia 1716-20 and 1746-50, yarn exports increased by just over half, from an annual average of 14,279 cwt. to one of 24,228 cwt. In the same period, the volume of cloth exported almost quadrupled (2,334,016 to 9,173,604 yards). The implications of the trend thus revealed become clear if the figures for yarn are expressed in their cloth equivalents, by adopting Horner’s estimate that 3550 cwt of yarn were required to produce one million yards of cloth.

The results, depicted in Figure One, indicate that until the early 1730s, the bulk of material exported from Ireland was shipped in the form of yarn. Thereafter, however, the balance shifted in favour of cloth, decisively so from the late 1740s, when the share of cloth in total linen exports almost invariably exceeded 60%. Yarn thus accounted for a diminishing proportion of Irish linen exports over the early to middle decades of the eighteenth century.

Given that Irish economic development was proceeding in a manner wholly compatible both with the interests of England’s staple woollen manufacture, such a trend occasioned little concern among most textile producing areas; Lancashire was the exception. Although output in the county had diversified over the seventeenth century, with the development of new cloth mixtures, linen remained a vital component of most, if not all of them. Its importance persisted beyond 1700 due to a combination of technological limitations and legislative proscription. The technological barrier was especially apparent on finer cloths. Until the advent of machine spinning, it proved difficult to produce warp thread of sufficient strength without recourse to ‘doubling’, a process which, by twisting a number of strands together, enhanced the volume of material and labour required in the production of the finished product and so inflated its price. The effect was to encourage the use of
linen yarn as a lower cost substitute. Legislative changes compounded the message relayed by the price mechanism. The 1721 Act, which prohibited the use and wear of East India calicoes, had made limited concessions to the native cotton industry. If the consumption of muslin could be sanctioned, on the grounds that no comparable native manufacturing interest was compromised, the exemptions granted to the manufacture of neckcloths and fustians represented a more genuine concession to domestic industrial interests. It also gave rise to problems. ‘Fustian’ was a notoriously vague term, capable of application to a variety of cloth mixtures. Over time, the creation of new variants (a key process in the growth of textile production throughout the period) would push at the bounds of the 1721 prohibition. In 1735, a prosecution was mounted by worsted manufacturers in Norwich against the production of printed fustians, in the course of which it was asserted that fustians were virtually indistinguishable from calicoes. A closer definition of the term ‘fustian’ was deemed essential, a need met by the 1736 Manchester Act, which stipulated that to qualify for immunity, the warp thread of any cloth containing cotton should be made from linen.

The result, at least in the short term, was to bolster Lancastrian reliance on Scots/Irish sources of yarn. A further effect was to confirm existing unease among producers of fustian in Lancashire at any concessions seen to privilege Irish or Scottish manufacturing interests. As early as 1704, linen merchants and manufacturers in Manchester, Preston, and Warrington had petitioned Parliament against allowing Irish producers free access to Plantations markets. Their campaign resumed when the Act came up for renewal in 1717. The prime concern of the petitioners was the ability this concession afforded Irish manufacturers to undercut their Lancastrian counterparts. The supply of yarn did not, as yet, occasion any serious alarm.
Indeed, a comparison of the movement in Irish linen yarn exports with that in retained raw cotton imports suggests that supplies of material for cotton-linen mixtures attained a rough equilibrium in the decades immediately following the 1721 Calico Act.

Table One and Figure Two here.

By the 1740s, that balance was fast disappearing. The first indication came with a surge in Irish linen yarn imports by some 31% in the latter part of that decade (a quinquennial average of 18,447 cwt. for 1741-5 rising to 24,228 cwt. in 1746-50). Although the precise cause of this increase cannot be ascertained with certainty, the fact that it coincided with the consolidation of export bounties in 1745 is suggestive. Demand from English linen manufacturers also seeking to exploit opportunities presented by the bounty is likely to have grown, more especially as the difficulties encountered in attempting to secure alternative European supplies of yarn in wartime may well have forced purchasers back on to Irish sources. Over the 1740s, growth in the volume of yarn imports from all sources was a much more modest 17% (a quinquennial average of 3,769,727 lbs. in 1741-5 compared to one of 4,408,430 lbs. in 1746-50). Ireland’s share of linen yarn imports into England thus increased from just below 60% in the early 1740s to approaching 70% later that decade. However elastic Irish yarn supplies proved to be, indications are that this did not suffice to meet the overall growth in demand for linen yarn in the later 1740s, as a marked tightening in yarn markets at this time became evident. In 1749, manufacturers in Manchester, Warrington, and Wigan opposed renewal of the 1745 bounty. The Manchester petition in particular noted that the encouragement given to cloth exports enabled Irish merchants to bid up the price of yarn. Irish spokesmen subsequently responded by blaming any increase in price on demand from
Manchester. Whatever the truth as to its cause, the overall upward drift in yarn prices was inescapable. Between 1746 and 1750, Irish yarn prices increased by approximately a quarter. Similar problems with the supply of yarn were evident in Scotland, where, in November 1750, the Board of Trustees noted

the Straits the Weavers and Manufactures are reduced to through the Extravagant prices paid for Spinning... The price of the different Grists being raised above 25 pCent within these few years. The price of Spinning advancing about 10 pcent every year for some years past. This is to be attributed in a great degree to the vast Quantities of Yarn which are every year transported to England, and exported to Ireland, and partly to the demand for our Cloth being much quicker now than formerly owing to the Improvements that have been made in the Quality and ffabrick of the Goods, and this obliges the manufacturers to press upon one another for Spinners in order to keep their looms at work.

Fears that escalating production costs would close off Plantations markets led to determined efforts to reduce the price of yarn. To this end, and to minimize the problem of interruptions to production brought about by a lack of inputs, a central warehouse was established at Leith to handle yarn purchased in bulk, which was then sold on to weavers at subsidized prices. At the same time, a more lasting remedy was sought in expanding the supply of available labour by ‘diffusing Spinning through the Highlands, which its [sic] hoped may also have the Effect to wean the Inhabitants of these Countries from those Evil habits of Idleness and disaffection to the Government, to which they have been so long accustomed’. Industry would, it
was hoped, draw the teeth of Jacobitism in areas sympathetic to the rebellion in 1745. In Ireland, members of the Linen Board attached more importance to extending and improving the cultivation of flax.\textsuperscript{liv}

In both countries, therefore, economic and political priorities worked to contain development within existing technological parameters. Despite compelling evidence of a tightening in yarn markets, the records of the Scottish Board of Manufactures reveal no attempt to promote a concerted search for new, more productive spinning techniques. Although a ‘new Kind of Spinning Wheel’ came under consideration early in 1747,\textsuperscript{lvii} the mechanical innovation which excited the greatest interest in this period was an improved shuttle, propelled across the loom by means other than by hand. As with Kay’s invention, this ‘improvement’, credited to John Johnston of Arbroath, promised to allow one weaver on broad woollen looms to do the work formerly undertaken by two.\textsuperscript{lviii} In Lancashire, by contrast, where Kay’s shuttle remained as yet little known, trends in the yarn market evoked a different response.

In 1751, the county’s manufacturers resumed their agitation for equality of treatment to enable them to compete in export markets with those linen producers who were better able to absorb the increase in production costs induced by the higher price of yarn through the assistance they received courtesy of the bounty. Their views were pressed through the forceful advocacy of that ‘profiteering Empire-builder’, Samuel Touchet. Touchet, the leading lobbyist in the Manchester interest at Westminster was then approaching the zenith of his influence as a projector of schemes for overseas expansion and a financier dealing in aristocratic and government debt.\textsuperscript{lix} In evidence to the Parliamentary Committee on the linen industry, he pressed the need for some concession given the near doubling in the price of raw
cotton over the later 1740s. In an effort to contain costs, Lancashire had been obliged to increase its purchases of linen yarn, with the result that cloth formerly manufactured mostly from cotton now comprised 75% linen thread.\textsuperscript{lx} Touchet’s solution to the cost squeeze in which Lancashire found herself was to allow manufacturers to gain access to cheaper sources of yarn by reducing the duty on imports from Europe. Parliament agreed a partial liberalization of trade from March 1752, reducing duties to 1d per lb. on brown and 3d per lb. on bleached yarns.\textsuperscript{lxii} The change in tariffs bore immediate fruit. Imports of ‘raw linen yarn’ from Europe which had averaged below 1 million lbs. per annum in the years to 1751 jumped to an annual average in excess of 2 million in the two years following the reduction in duties. By contrast, Ireland’s share of total yarn imports showed a further fall from their peak in the late 1740s to below 50%.\textsuperscript{lxii}

Table Two here.

Touchet had argued that the growth in demand for linen yarn had been driven by the need to reduce costs. Yet purchases of raw cotton also increased markedly in these years, rising from a quinquennial average of 1.6 million lbs. in the early 1740s to one of 3.4 million lbs. ten years later. What is more, despite evidence of significant price inflation, growth in imports of Levant cotton was even more pronounced (197,586 lbs. to 1,574,000 lbs. over the same quinquennia).\textsuperscript{lxiii} The determination thus displayed to corner the market in raw cotton suggests that the cost of raw materials, while it was a major, may not have been the sole consideration in determining the production of fustian. By the 1750s, output quality had become an important consideration for producers in Lancashire and elsewhere across the three kingdoms. In part, this could be attributed to changes in the market for fashionable textiles, in particular growing demand from the affluent middling ranks of society both at home
and in North America. It may also have reflected a desire to exploit more immediate opportunities in the export trade in fine cloths to west Africa, formerly supplied predominantly from India. Improvements in quality had long driven technological change in the production of textiles. Quality considerations also figured prominently in Robert Kay’s enumeration of the benefits expected to accrue from use of his father’s shuttle. The greater quantity of yarn carried on the shuttle would necessitate fewer piecings, while the more direct path taken across the warp would ensure a more even weave. The pressure to raise the quality of the output mix which encouraged take up of the shuttle would also generate early attempts to transform the spinning process.

By the early 1750s, the options available to Lancashire to achieve growth in the level and quality of output at prices that would enable her to compete in both home and export markets were narrowing alarmingly. The cost of ready-spun yarn, both linen and cotton, was rising. Indeed, the price of the latter had almost doubled from the mid-1730s. The importation of raw cotton represented one way forward. Yet even this was not without its problems, as it would have to be worked up into yarn within Lancashire using available sources of labour and it was by no means clear that these were sufficiently elastic to achieve this within the existing technology. The production of cotton-linen mixtures was highly localized and centred on an area comprising south-east and south-central Lancashire, extending into north-east Cheshire. To the west, from the Fylde coast down to Warrington, activity centred on the production of pure linens, while to the east, Pennine districts specialized in the processing of wool. With each ‘riding’ drawing on its own distinctive network of skills and credit, opportunities to expand the production of cotton-linen mixtures by putting material out to labour in neighbouring areas may have been limited. Such is
certainly suggested by the failure of attempts to establish the industry in upland areas, including the Rossendale Valley and the Saddleworth district east of Oldham.\textsuperscript{lxix}

A more viable option was to enhance the productivity of existing reserves of labour. It is no surprise, therefore, that the earliest attempts to mechanize cotton spinning from within the region date from this period. Two machines were developed in the early 1750s, both originating in the south-east of the cotton-linen producing area. The first was by Lawrence Earnshaw of Mottram-in-Longdendale near Stockport (not patented, c.1753), the second by James Taylor of Ashton-under-Lyne (patented, 1755). The mechanical principles on which they were based are less than clear. However, both appear to have been designed to produce warp thread. Earnshaw’s machine claimed to ‘spin and reel cotton in one operation’, which would necessitate the harder twist required of warp yarn, while the Ashton area was known to specialize in production for warps.\textsuperscript{lxx} Yet, despite outwardly propitious circumstances, neither machine secured commercial application. Earnshaw, in the kind of selfless gesture guaranteed to cement his reputation as ‘the greatest mechanical [but not business] genius the county of Chester ever produced’, was said to have destroyed his machine in preference to depriving the poor of employment.\textsuperscript{lxxi} Taylor, it was reported, was forced to a similar conclusion by an anti-machine riot.\textsuperscript{lxxii} None of the sources on which these stories are based are precisely contemporaneous with the events they purport to describe, a point of some importance if account is taken of the circumstances in which they were written. Earnshaw’s self sacrifice was commemorated in the \textit{Gentleman’s Magazine} in 1787, towards the end of a decade marked by acute debate over the employment implications of machinery in the textile trades, while Taylor’s misfortunes were described in his obituary notice, again in the \textit{Gentleman’s Magazine} for 1813, the year following major Luddite disturbances.
There are grounds for believing therefore that both accounts may have been coloured by later events. However, even if their accuracy is accepted, we might note that both Hargreaves’ jenny and Arkwright’s water frame excited anti-machine sentiments, but that this did not prevent their wider adoption. The key difference between their experience and that of Earnshaw and Taylor some 15 years earlier seems to have been the relative level of support received from local manufacturers.

In the mid 1750s, a more attractive, because more immediately rewarding, method of relieving Lancashire’s problems of raw-material supply appeared to lie in gaining access to wider sources of ready-spun yarn. From 1753, a campaign was mounted for the abolition of all duties on imported linen yarn, which united manufacturers of cloth in Lancashire and across Ireland and Scotland. This alliance was substantially a Scottish construct. By 1753, linen producers there were anxious to secure renewed assistance from Parliament after the export bounty on cloth had been allowed to lapse. Initially, they pressed for the removal of the drawback on foreign linens exported to the Plantations, but eventually revised their aim to the straightforward restoration of the bounty. To further this end, Scottish lobbyists sought to galvanize Lancastrian support by linking their campaign to calls for the removal of import duties on yarn. The latter was seen explicitly as a concession to the Manchester interest. As the Scots’ agent in London, William Tod, explained (prior to the shift in favour of reinstating the bounty):

I have done all in my power to unite the Irish and Manchester interest in order to get something done effectually to promote the linnen Manufacture…and if something unforeseen doeth not prevent there will be a great Application next Session from the whole British & Irish to take off the duty upon foreign Yarn
imported, & the drawback upon foreign linen exported to our Plantations.— The
first is to serve the Manchester people & the last in place of the bounty on
brown & white British and Irish linnen exported

As the campaign progressed, significant fissures in opinion across both Lancashire
and Scotland were exposed. Manufacturers in the west of Scotland opposed any
change in import duties, arguing that it would severely affect local employment in
spinning. Similar concerns were voiced by linen producers in west and south-west
Lancashire (including Warrington, Preston, Kirkham, and Poulton). Such
objections carried little weight in areas to the east, long used to the processing of
material imported in ready-spun form. These included Stockport, the centre of the
district where both Earnshaw and Taylor were active. In support of the case for
removing all duties on imported yarn it was urged that weaving and finishing
processes generated higher levels of employment and represented a larger proportion
of the value of the end product than did spinning. In the Parliamentary debate that
ensued, attention was primarily directed to the clauses relating to the removal of
import duties; the restoration of the bounty, by contrast, excited little controversy.
Nevertheless, by March 1756, both points had been carried. For all its success, the
Parliamentary campaign was based on a recognition that, over the preceding decades,
Lancastrian, Irish, and Scottish interests had increasingly diverged. For linen cloth
production to flourish without compromising Lancashire’s trade, the latter would have
to look elsewhere for its raw materials.

The hopes thus invested in European sources of yarn were, almost
immediately, disappointed. The outbreak of the Seven Years’ War in the very year
that import duties were removed, seriously disrupted commercial links with the
Continent. Figures prepared by the Customs House suggest that, for much of the war, European yarn shipments were barely half their peak levels of the early 1750s (1,478,128 lbs. in the quinquennium 1759-63, compared with 2,833,753 lbs. in the years 1752-3). Raw cotton imports also fell by some 40% in the first five years of the conflict, with landings from the Levant especially depressed. The failure to secure alternative raw material supplies threw Lancashire back on to established Irish and Scottish sources. Irish yarn, which in the early 1750s made up around half the yarn landed in England from outside Great Britain, accounted by the early 1760s for over three-quarters of that total. In terms of volume, Irish exports were some 40% up on the level of ten years earlier (see Table Two). Yet this impressive growth did not suffice to maintain overall yarn imports at their immediate pre-war levels (an average of 5,579,413 lbs. being landed in 1752-3 compared to 5,272,087 lbs. in the quinquennium 1759-63). In the absence of figures for Scottish exports, the picture of yarn supplies capable of being garnered from available sources is less than complete. All the indications are, however, that Scottish shipments failed to prevent a discernible tightening in the market for yarn from the mid-1750s onwards.

Price movements provide compelling evidence that, although output may have grown in response to a outward shift in the demand curve for linen yarn, it proved difficult to achieve an equivalent increase in supply. In 1760, the Scottish Trustees received complaints from manufacturers in the district around Perth, a major centre of coarse linen production, that ‘Home spun yarn has been excessively dear for some time past and often could not be got’. Similar protests were manifested in parts of Ireland also. Equally, merchants dealing in Irish cloth in North America noted that high prices in wartime were limiting sales. In no case were such complaints backed up by precise figures. Scattered price data suggest, however, that
such comments were not without foundation. The Perth complaint coincided with an upturn in prices paid to spinners in north-east Scotland, culminating in a short-lived peak in mid-1761, in which rates were some 25% to 33% above the level of late 1759. Yarn prices paid in Leith, near Edinburgh, showed a similar upward tendency. In the eighteen months to January 1764, prices for a range of yarn qualities, from three to nine hanks, rose by more than 10%. Regrettably, the available sources do not permit detailed reconstruction of longer-term price trends. Nevertheless, in evidence to a Parliamentary inquiry into the state of the linen trade in the early 1770s, Robert Rayment, a London dealer in Irish linens, indicated that by 1763, yarn prices had risen to some 40% above the level recorded in 1751, the point at which Lancashire had begun to explore alternatives to Irish/Scots sources of supply.

The problem may have extended beyond price. Within existing technological and structural constraints, growth in output could, in the short term, compromise quality. If the need for close control over the quality of output was paramount at such times, indications are that this proved difficult to maintain. Pamphlets spanning the period of the war protested against abuses in the marketing of yarn across Ireland. These concerns became so pronounced that, in 1763, merchants at Chester were reported to be planning a boycott of Irish linens. In Scotland, in 1760, the Board of Trustees received complaints that cloth of uneven quality was being stamped for sale. Considerations of quality were all the more important given the markets to which Lancastrian production was increasingly directed. By the 1760s, in addition to the sizeable if unquantifiable home market, the largest sales of printed cottons and linens were to North America, Africa, and northern Europe. The importance of output quality in the emergence and development of new production techniques has
already been explored in relation to Kay’s shuttle. Equally, in the pamphlet debate surrounding the impact of machine spinning in the 1780s, advocates of the new process made much of the improvements in quality that would result from its adoption. Looking back over the previous twenty years, ‘a Friend of the Poor’ felt bound to observe that

The fabrick, the quality of the goods we make, is amazingly changed. How many kinds of cloth are made, in very great quantities, which could not possibly, have been made, at least in any quantity, or so cheap as to sell, without our machines?\(\text{xcv}\)

Mechanization, it was argued, would ensure that growth would no longer be constrained by problems of quality, which usually set in as output expanded.\(\text{xcvi}\)

By the late 1750s, therefore, trading links with Ireland and Scotland, hitherto the life-blood of Lancastrian textile production, were coming to be seen as a restraint on growth. In both Ireland and Scotland also, the necessary complementarity of their interests with those of textile producers in Lancashire was being questioned. In its early years, the Irish Linen Board, in the belief that Ireland lacked the capacity to work up the whole of domestic output, had promoted the export of yarn as an important source of overseas earnings.\(\text{xcvii}\) Such a policy was increasingly questioned, however, as Irish cloth production expanded. By the late 1750s, influential figures in the Irish linen trade, such as the merchant Robert Stephenson, were arguing that yarn exports represented a drain on national wealth. The Linen Board’s aim should therefore, he argued, be to maximize the processing of yarn into cloth so that Ireland would benefit fully from the further value added. From this, Stephenson proceeded to
advocate a bounty on cloth exports and a duty on yarn exports to regulate the price for native cloth manufacturers.\textsuperscript{xcviii} Unsurprisingly, these proposals were said to have excited considerable alarm among ‘Manchester fustian’ manufacturers.\textsuperscript{xcix} In Scotland also, the export of yarn was by 1763 judged prejudicial to native manufactures by raising the price considerably above what could reasonably be afforded.\textsuperscript{c} Notions of complementarity no longer figured in the calculations of producers across the three kingdoms.

Although acute problems of supply afflicted Lancastrian textile production in the early stages of the Seven Years’ War, some relief was afforded by the capture, during Pitt’s ‘annus mirabilis’ of 1759, of the French cotton island of Guadeloupe.\textsuperscript{ci} As a consequence of this and other military successes across the Caribbean, the quantity of raw cotton landed from the West Indies increased by some 50\% in the latter half of the war (from an annual average of 1,588,813 lbs. imported in the period 1756-9 to one of 2,375,156 lbs. in 1760-3). By the early 1760s, retained cotton wool imports as a whole approached the levels of ten years earlier (a quinquennial average of 3,061,000 lbs. in 1761-5 compared to one of 3,423,256 lbs. in 1751-5 and see Figure Two).\textsuperscript{cii} Already in the early 1750s, pressures exerted by the need to process the growing volume of imported raw material within the county had called forth proposals to mechanize the spinning of cotton yarn.\textsuperscript{ciii} Those efforts were now renewed, with the crucial difference that the machines developed by James Hargreaves and Richard Arkwright excited far greater interest within the trade than had those of Earnshaw and Taylor. The decade or so separating the two waves of invention had served to confirm the uncertainties surrounding the supply of Irish and Scottish linen yarn and had exposed as chimerical the hopes that European yarn would be a cheap and reliable alternative. Only cotton appeared to offer the security
and elasticity in supply necessary to sustain growth. Despite the greater demands which the processing of raw cotton placed on local producers, Lancastrian concern now centred on supplementing further available supplies of cotton. In April 1766, even though raw cotton purchases had fully recovered their pre-war levels, manufacturers and merchants in Manchester pressed for the creation of free ports in the West Indies to gain access to new, foreign sources of supply. In the event, the petitioners’ vision of ships ‘laden with cotton’ traversing the Atlantic proved overly optimistic. The volume of raw cotton imported from the Caribbean barely rose in the first five years under the Act (an annual average of 2,783,803 lbs. for the quinquennium 1767-71 compared with one of 2,640,089 lbs. for 1762-6). Nevertheless, the inclusion of a clause in the Act remitting all import duties on cotton wool boosted purchases from other sources. Increased shipments, particularly from the Near East, ensured that retained raw cotton imports as a whole grew by some 40% over the decade, comparing the quinquennia 1761-5 and 1766-70.

The interest thus generated in new spinning techniques extended considerably beyond those immediately interested in the trade, such as the Blackburn hand weaver, James Hargreaves. Rather, it permeated the region, drawing to the trade such figures as that determined profit maker and acute man of business, Richard Arkwright. Arkwright’s knowledge of and interest in the cotton trade may be traced to his employment from the early 1750s as a fashionable barber in the fustian manufacturing centre of Bolton. Certainly, by 1767, he was sufficiently aware of the demand for mechanical methods of cotton spinning and the technical and financial problems attending them to comment with scepticism on the practicability of machine spinning by rollers. The following year, Arkwright was in Preston in the company of the Warrington clock maker John Kay and was reported, on Kay’s authority, to be
working on a machine ‘to find out the Longitude’.\textsuperscript{cxi} This remark may be taken as evidence of Arkwright’s particular genius for obfuscation, a genius which would result in a successful legal challenge to his combined carding and spinning patent of 1775 on the grounds of inadequate disclosure.\textsuperscript{cxii} It may also have been intended as an elliptical reference to the machine’s prime function: to facilitate the production of the thread that ran the length of the loom, or the warp. Certainly, the water frame came into use manufacturing cotton warps and its success seems to have encouraged attempts to develop alternative techniques with the same end in view. Such at least is suggested by the demonstration in Manchester in 1771, two years after the water frame was patented, of an improved jenny capable of producing warps.\textsuperscript{cxiii}

The drive to boost cotton production through the application of machine technology aimed, even at this early stage, at more than an increase in the supply of weft, for which cotton had long been used. Increasingly, mechanization was designed to promote cotton’s use in the making of warps, substituting for Irish, Scottish, and European sources of linen yarn. That process was well under way by 1774, when Parliament was inundated with petitions from linen producing areas complaining of a depression in that trade. The petition from Dumfries is of particular interest, noting as it did that ‘the Spinning of Yarn for supplying the Manufactures of England is much decreased’.\textsuperscript{cxiv} Despite this, important legal obstacles to the growth of cotton production remained, in particular the prohibition on the use of cotton warps in cloth. The production of all-cotton cloths posed an obvious challenge to the clarification of the 1721 Calico Act offered by the Manchester Act of 1736. So, in 1774, Arkwright, along with his Nottingham partners, Need and Strutt, pressed Parliament to exempt home-produced calicoes from the terms of the 1721 prohibition.\textsuperscript{cxv} Once a means of distinguishing the home-produced from the imported article had been decided on, the
point was readily conceded, heralding a further wave of expansion for the trade.\textsuperscript{cxvi} In the quinquennium following the lifting of the threat of prohibition, average yearly retained raw cotton imports were some 62\% up on the five years to 1774 (5,931,446 lbs. in the quinquennium 1775-9, up from 3,662,531 lbs. in 1770-4). Over the same period, the growth in Irish linen yarn exports was limited to 9\% (29,460 cwt., rising to 32,046 cwt.).\textsuperscript{cxvii} The process, initiated in the 1760s, by which cotton came to replace Irish and Scottish yarn in Lancashire’s product mix was thus significantly advanced. Even then, it would another decade before the process of substitution would be substantially complete. In 1783, James Ogden could still write in anticipation of the gains to be wrought by replacing linen with cotton:

\begin{quote}
if cotton comes down to a reasonable price, the warps made of this twist would be as cheap as those made of yarn, and keep the money here which was sent abroad for that article, there being no comparison between yarn and cotton warps for goodness\textsuperscript{cxviii}
\end{quote}

Ogden’s observation is of interest. The gains in quality offered by the use of cotton thread had for some time been offset by a significant price differential over linen yarn. Changes in production, assisted by successive enactments by late-Stuart and early-Hanoverian Parliaments, weakened the comparative advantage of linen in the output mix, to the extent that the manufacture of all-cotton cloths and the challenge this posed to existing production methods could be countenanced. Technological change, culminating in the development and perfection of the mule would irrevocably tilt the balance in favour of cotton and so finally sunder the ties binding Lancashire to spinners across Ireland and Scotland. In the process, a further step was taken towards
the regional specialization that would come to characterize the Britain of the Industrial Revolution.

II. The mechanization of cotton spinning in the third quarter of the eighteenth century was the outcome of a variety of influences. This paper has been concerned with one such. By the middle decades of the century, changes in the price of key raw materials were causing increasing concern among textile producers across the British Isles. Beverly Lemire has seen these developments, more particularly the inflation in the price of linen yarn in the decade or so separating the Parliamentary inquiry of 1751 and the end of the Seven Years’ War, as crucial in precipitating a shift from the production of cotton-linen mixtures to purely cotton cloth. While this paper broadly endorses that view, it has also endeavoured to show that the problems facing Lancastrian producers in particular were both more long-term and systemic in character. For several decades prior to the 1750s, the market context in which textile manufacturers operated had been coloured by an evolving body of Parliamentary legislation. To reiterate, the sequence of change outlined here was neither envisaged nor intended by legislators. Successive enactments contributed to but did not determine the decisions of economic actors. In doing so, they played a key role in shaping the economic relationships between component parts of the Hanoverian State, as producers across Ireland and Scotland came to question established trading networks, as they shifted from acting as suppliers of semi-finished inputs to satisfying their own industrial needs. The linkages which, for Lancashire, had facilitated growth in the level and diversity of cloth output were increasingly called into question. By the 1750s, problems on the supply side sufficed to oblige the county to look beyond the British Isles to satisfy its raw material needs. A remedy was sought at Westminster, in
conjunction with the Scottish and Irish lobbies, which recognized the increasingly divergent interests of the three kingdoms. Yet the solution promised by the freeing of the market in linen yarn proved chimerical in the altered circumstances of the Seven Years’ War. A more lasting remedy was found in the switch to cotton, allied to the adoption of novel production techniques. Whatever innovation owed to the peculiar native genius embodied in that familiar triumvirate of Hargreaves, Arkwright, and Crompton, it was also the outcome of forces operating beyond the region, which tied the peripheries to the core of the Hanoverian state, and the Imperial parliament to Britain’s burgeoning colonial possessions. A historiography dominated by the deeds of hard-working, sometimes ill-educated provincial craftsmen responding to endogenously-created challenges, presents at best a half-truth. The mechanization of cotton spinning was the outcome of political and diplomatic as well as economic forces.

A further observation may also be offered. In the pace and intensity of the changes they entailed, the new spinning machines of the later eighteenth century can appear as outliers in the technological history of the period, validating the depiction of growth as an unbalanced and concentrated in particular sectors. Yet, as an earlier paper by the current authors has suggested, until the final decade of the century, almost half of all recorded inventions in the British textile industries were concerned with the nature and appearance of the end product. Indications are that the efforts of contemporary mechanics may have been coloured by similar concerns. As represented by its advocates in the pamphlet debate which erupted in the 1780s, and by Arkwright himself in the trial over his second patent, the advantages of mechanization lay not only in the capacity to reduce the costs of various factor inputs, but also in the extent to which it was seen to enable a more varied and higher quality
product mix to be achieved within an expanding manufacturing base.\textsuperscript{cxxii} Lancashire thus avoided the problems of variable quality encountered in both Ireland and Scotland when attempts were made to expand output within existing technological parameters in the late 1750s. In enabling native manufacturers to satisfy the demand for high-quality goods evinced by growing numbers of middle-ranking consumers, the machines that heralded and then sustained Ashton’s ‘wave of gadgets\textsuperscript{cxxiii} were wholly of their time.

University of Edinburgh

Reading

London School of Economics
Footnote References:

‘A Friend of the Poor’, Thoughts on the use of machines, in the cotton manufacture, addressed to the working people in that manufacture, and to the poor in general (Manchester, 1780).

Aiken, J., A description of the country from thirty to forty miles around Manchester (New York, 1968 reprint).

Almon, J., Anecdotes of the life of the right honourable William Pitt, Earl Chatham, and the principal events of his time: with his speeches in parliament from the year 1736 to the year 1778. Volume I (1792).

Anon., An act for opening certain ports in the islands of Jamaica and Dominica (1766).

Anon., Copies of the several memorials presented to the linen board by the merchants of Dublin, London, Bristol, Liverpool, Chester, and different parts of England, concerning the late regulations of the board, and the present design of making a new body of laws, for the better order and regulation of the linen manufacture of Ireland (Dublin, 1763).

Anon., Observations on the several matters offered to the linen board, as materials for a linen bill; particularly on a paper, called observations on the linen trade, together with some humble hints with regard to the proposed amendment of our linen laws, by the linen weavers and manufacturers of the towns of Belfast, Lisburn, Hillsborough, and county adjacent (Dublin, 1763).

Anon., Some thoughts on the importance of the linen manufacture to Ireland, and how to lessen the expense of it (Dublin, 1739).

Anon., The case of the importers of cotton wool, and the manufacturers thereof into fustian, and of the traders in that manufacture (n.d.).
Anon., The case of the worsted and silk manufacturers (1736).

Anon., ‘The interest of England, as it stands with relation to the trade of Ireland, considered, the arguments, against the bill, for prohibiting the exportation of woolen manufactures from Ireland to foreign parts, fairly discussed.’ (1698), reprinted in J. Smith, ed., Chronicon rusticum-commerciale; or memoirs of wool, &c. (New York, 1969 ed.), vol.1, pp.7-16.

Anon., ‘The linen and woolen manufactory discoursed, with the nature of companies and trade in general, and particularly that of the companies for the linen manufactory of England and Ireland; with some reflections how the trade of Ireland hath formerly, and may now affect England’ (1691), in J. Smith, ed., Chronicon rusticum-commerciale; or memoirs of wool, &c. (New York, 1969 ed.), vol.1, pp.383-8.

Anon., The following papers, collected and seriously deliberated upon, by a number of linen-drapers in and near Lisburn and Belfast, are humbly presented to…the trustees of the linen manufacture, as materials for a linen bill, and humbly submitted to their consideration preparatory to a new act of parliament for the better order, regulation, and improvement of the said manufacture (Belfast, 1763).


Atwood, T., The history of the island of Dominica (1791).

Beer, G.L., British colonial policy, 1754-1765 (New York, 1907).


Burn, R., Statistics of the cotton trade (n.d.).

‘C.S.’, Merchant, Informations to the people of Ireland, concerning the linen trade of Spain, Portugal, and the Spanish West Indies (Dublin, 1760).


Chadwick, W., Reminiscences of Mottram (Longdendale, 1972 reprint).


Cullen, L.M., An economic history of Ireland since 1660 (1972).

Cunningham, W., The growth of English industry and commerce in modern times: the mercantile system (Cambridge, 1938 ed.).


Deane, P., The first industrial revolution (Cambridge, 1979 ed.).

Dunscombe Pink, W., ed., Lancashire and Cheshire antiquarian notes (Leigh, 1885).


Enfield, W., An essay towards the history of Liverpool, drawn up from papers left by the late Mr George Perry, and from other materials since collected by William Enfield, with views of the principal public structures, a chart of the harbour, and a map of the environs (1774 ed.).

Espinasse, F., Lancashire worthies (1874).


Gee, J., Observations on the growth of hemp and flax in Great Britain (1765).

Gentleman’s Magazine (1731-1813).


Guest, R., *A compendious history of the cotton manufacture; with a disproval of the claim of Sir Richard Arkwright to the invention of its ingenious machinery* (Manchester, 1823).

Guest, R., *The British cotton manufactures, and a reply to an article on the spinning machinery contained in a recent number of the Edinburgh Review* (Manchester, 1828).


Inikori, J.E., Africans and the industrial revolution in England: a study in international trade and economic development (Cambridge, 2002).


Manchester 200 years ago: being a reprint of A description of Manchester by a native of the town, James Ogden, published in 1783. edited, with an introduction, by

Mantoux, P., The industrial revolution in the eighteenth century: an outline of the beginnings of the modern factory system (1961 ed.).


‘N.A.’, A letter to his excellency Henry Boyle esq., Speaker of the honourable house of commons in Ireland: with remarks on the linen trade and manufactures of the kingdom, and some hints for promoting the same (Dublin, 1753).


Papillon, T., A treatise concerning the East-India trade: being a most profitable trade to the kingdom, and best secured and improved by a company and a joint stock (1696).


Plan by the commissioners and trustees for improving fisheries and manufactures in Scotland, for the application of their funds (Edinburgh, 1727).


Precedents and abstracts from the journals of the trustees of the linen and hempen manufactures of Ireland to the twenty-fifth of March mdccxxvii (Dublin, 1784).


Prior, T., *An essay to encourage and extend the line manufacture in Ireland by praemiums and other means* (Dublin, 1749).


Ross, R. (attrib.), *Some considerations on the improvement of the linen manufacture in Ireland, particularly with relation to the raising and dressing of flax and flax seed* (Dublin, 1753).


Smithers, H., Liverpool, its commerce, statistics, and institutions; with a history of the cotton trade (Liverpool, 1825).


Stephenson, R., Considerations on the present state of the linen manufacture humbly addressed to the trustees of the linen-board (Dublin, 1754).

Stephenson, R., An inquiry into the state and progress of the linen manufacture of Ireland (Dublin, 1757-8).

Stephenson, R., Observations on the present state of the linen trade of Ireland: in a series of letters, addressed to the right honourable and honourable the trustees of the linen manufacture: in which the reports, libel, and British examination of Mr John Arbuthnot, inspector general of Leinster, Munster, and Connaught, are considered and refuted (Dublin, 1784).

Sutcliffe, T., An exposition of facts relating to the rise and progress of the woollen, linen and cotton manufactures of Great Britain (Manchester, 1843).


The trial of a cause instituted by Richard Pepper Ardern, esq., his Majesty’s Attorney General, by writ of scire facias, to repeal a patent granted on the sixteenth of December 1775, to Mr Richard Arkwright (1785).


Wadsworth, A.P., and Mann, J. de L., The cotton trade and industrial Lancashire, 1600-1780 (Manchester, 1931).


Whyte, I.D., Scotland before the industrial revolution: an economic and social history, c.1050-c.1750 (Harlow, 1995).


Willan, T.S., Elizabethan Manchester (Manchester, 1980).


**Official Publications:**

**Journals of the House of Commons.**

**Reports from committees of the house of commons, II, miscellaneous subjects, 1738-65:**

‘Report from the committee on the petition of the dealers in, and manufacturers of, linens’, reported by Lord Limerick, 11 March, 1744.

‘Report from the committee appointed to examine and state to the house, the matters of fact in the several petitions of the manufacturers of, and traders and dealers in, the linen manufactory’, reported by Lord Strange, 26 April, 1751.

**Reports from committees of the house of commons, III, 1771-3 (1803)**

‘Report from the committee appointed to enquire into the present state of the linen trade in Great Britain and Ireland’, reported by Lord Frederick Campbell, 25 May, 1773.

**The statutes at large of England and of Great Britain from Magna Carta to the union of the kingdoms of Great Britain and Ireland, vol.4, 7 Anne A.D. 1708 to 13 Geo. I A.D. 1726 (1811).**

**The statutes at large, vol.5, 1 Geo. II A.D. 1727 to 23 Geo. II A.D. 1750 (1811).**

**The statutes at large, vol.6, 24 Geo. II A.D. 1751 to 7 Geo. III A.D. 1767 (1811).**
The statutes at large, passed in parliaments held in Ireland: from the third year of Edward the Second, A.D. 1310, to the twenty sixth year of George the Third, A.D. 1786 inclusive (Dublin, 1786).

The statutes of the realm (1820).

---

i The authors would like to thank three anonymous referees for their helpful comments on an earlier version of this paper.


iv The problem of authorship centres mostly but not exclusively on the controversial figure of Richard Arkwright. See especially Guest, A compendious history; idem,
The British cotton manufactures: The trial of a cause. Guest’s claims extended to authorship of the jenny, and were taken up in Sutcliffe, An exposition of facts, p.8.

\(^{v}\) see especially, O’Brien, Griffiths, and Hunt, 'Theories of Technological Progress and the British Textile Industry from Kay to Cartwright’.

\(^{vi}\) Landes, The Unbound Prometheus.

\(^{vii}\) Hudson, ‘Industrial organisation and structure’; North, Structure and Change in Economic History; Williamson, ‘The Organisation of work’; Landes, ‘What do bosses really do?’.


\(^{ix}\) Griffiths, Hunt, and O’Brien, 'The Curious History and Imminent Demise of the "Challenge and Response" Model’.

\(^{x}\) Inikori, Africans and the industrial revolution in England, Appendix 9.9, p.519; on the Atlantic trade in general, see K. Morgan, Slavery, Atlantic trade and the British economy, esp. ch.5; Zahedieh, ‘Economy’

\(^{xi}\) Morgan, Slavery, Atlantic trade, p.73, ‘In the thirty years after 1760 the timing of the rapid diffusion of cotton-spinning techniques via the spinning jenny, Arkwright’s water frame and Crompton’s mule appears to be closely linked to increased domestic and overseas demand- a growth in aggregate demand- for cotton fabrics’; the concept of ‘import substitution industrialization’ is set out in Inikori, Africans and the industrial revolution, pp.140-155.
Berg, ‘New commodities, luxuries and their consumers’; idem, ‘From imitation to invention’.

Mokyr, The lever of riches; idem, ‘Technological change, 1700-1830’.


Gribbon, ‘The Irish Linen Board’; Durie, The Scottish linen industry in the eighteenth century, pp.12-19; Plan by the commissioners and trustees for improving fisheries and manufactures in Scotland; Innes, ‘Legislating for the three kingdoms’ and Harris, ‘The Scots, the Westminster parliament, and the British state’. Recent work has stressed that the body of mercantilist regulation enacted from the late seventeenth century cannot be understood to have constituted a coherent ‘industrial policy’ and that the prime economic consideration driving such policy remained the balance of trade, Ormrod, The rise of commercial empires, pp.168-73, although see Sickinger, ‘Regulation or ruination’.

Cullen, An economic history of Ireland since 1660, p.34; Mackey, ‘Overseeing the foundation of the Irish linen industry’, p.103; H. of C. Journals, XII, 467-642.

See below, n.54.


Roberts, ‘The treasure of traffike’, p.73; Lowe, The Lancashire textile industry in the sixteenth century, pp.11-13; Rawlings, ‘The rise of Liverpool and demographic change’, p.11; Smithers, Liverpool, its commerce, statistics, and institutions, p.89.

Whyte, Scotland before the industrial revolution, pp.271-6, 281-6; Lythe, The economy of Scotland in its European setting, pp.38, 222; Keith, Commercial relations of England and Scotland, p.78; Smout, Scottish trade on the eve of Union, p.233.

Durie, The Scottish linen industry in the eighteenth century, p.39; see also the petition of Andrew Ramsay, Provost of the City of Glasgow, which in response to the call in 1736 to prohibit the manufacture of cotton-linen mixtures in imitation of calicoes observed that ‘great Quantities of Linen Yarn, of the Growth and Spinning of North Britain, are yearly sent to Manchester, Kendall, and other Places of England, and there worked up into Fustians, and other manufactures’, H. of C. Journals, XXII, 595.

Roberts, ‘The treasure of traffike’, p.73.

Smithers, Liverpool, its commerce, statistics, and institutions, p.89; Price, ‘On the beginning of the cotton industry’, pp.32-3.


Anon., ‘The interest of England, as it stands with relation to the trade of Ireland’, p.15; also Papillon, A treatise concerning the East-India trade, pp.9-11.

Wilson, Anglo-Dutch commerce and finance, p.56.


The statutes of the realm, VII, p.156; H. of C. Journals., XI, pp.529-64; XIV, p.273; Reports from committees of the House of Commons, II, 1751 committee, p.300.
xxxii H. of C. Journals, XXIII, pp.26-157 (Feb. to April, 1737/8).

xxxiii Ibid., XXIV, pp.189-333 (April to July, 1742). The bounty was financed out of increased charges on imported French cambrics.

xxxiv National Archives of Scotland (hereafter NAS), Board of Manufactures, NG 1/1/9, minutes of Trustees’ meetings, 15 Feb, 1748.

xxxv H. of C. Journals, XXIV, pp.584-647 (Feb. to April, 1743/4), 770-891 (Feb. to May, 1744/5); Reports from committees of the House of Commons, II, 1744 committee, pp.69-71.

xxxvi Reports from committees of the House of Commons, II, 1751 Committee, Appendix VIII, p.315.

xxxvii Calculated from Gill, The rise of the Irish linen industry, p.341.

xxxviii Calculated from Mitchell and Deane, Abstract of British historical statistics, p.200; Campbell, ed., States of the annual progress of the linen manufacture, p.141.

xxxix NAS, Seafield Muniments, GD 248/954/2/3, p.3; Board of Manufactures, NG 1/1/7, minutes of Trustees’ meetings, 11 Nov., 1743; 13 June, 1744.

xl Calculated from Gill, The rise of the Irish linen industry, p.341.


xlii Calculated from Gill, The rise of the Irish linen industry, p.341.

xliii Wadsworth and Mann, The cotton trade and industrial Lancashire, pp.111-16; Manchester 200 Years Ago, pp.25-6.


*H. of C. Journals*, XIV, pp. 498, 504, 515; XVIII, pp. 540-6 (petitions from Manchester, Wigan, and Warrington).


NAS, Board of Manufactures, Custom House Returns, NG 1/16/1, fos. 15-17, ‘An Account of the Quantities of Foreign Linen Yarn imported into that part of Great Britain called England from Christmas 1740 to Christmas 1749 Distinguishing each year The place from whence imported, the several species of such yarn, and the Duties paid thereupon’, ‘An Account of the quantity of Foreign raw Linen Yarn and Spruce or Muscovia Yarn imported into that part of Great Britain called England from Christmas 1748 to Christmas 1753 Distinguishing each year The places from whence imported and the Duties paid thereon’, ‘An Account of the quantity of Linen Yarn imported from Ireland into that part of Great Britain called England from Christmas 1748 to Christmas 1753 Distinguishing each year’.


See the comments of the Rt. Hon. Arthur Hill in evidence to the 1751 Committee on the linen industry, *Reports from the House of Commons, II*, p. 298.

Ibid., pp. 291, 292, 294; *H. of C. Journals*, XXVI, p. 109, petition of merchants and dealers in the City of London in the cotton trade and British manufactures of chequered and striped linen.

NAS, Board of Manufactures, NG 1/1/11, minutes of Trustees’ meetings, 16 Nov., 1750.
This is a repeated theme in the pamphlet literature of the period, Ross, Some considerations on the improvement of the linen manufacture in Ireland; Anon., Some thoughts on the importance of the linen manufacture to Ireland; Prior, An essay to encourage and extend the linen manufacture in Ireland; ‘N.A.’, A letter to his excellency Henry Boyle Esq.; Stephenson, Considerations on the present state of the linen manufacture.

Although technical evaluation was initially supportive and a salary of £20 a year was paid to Johnston in recognition of his contribution, the final conclusion was altogether less favourable as the shuttle appeared ‘not to be of any real use or benefit to the manufacture, no method having been yet found to make the Shuttle go in a right direction’. NAS, Board of Manufactures, NG 1/1/8, minutes of Trustees’ meetings, 7 March, 1746; 4 March, 1747; NG 1/1/9, 24 June, 1748; NG 1/1/12, 19 Jan., 1753.

Touchet’s colourful progress is captured in Wadsworth and Mann, The cotton trade and industrial Lancashire, pp.244-8.

Reports from committees of the House of Commons, II. 1751 Committee, p.291, Appendix III, p.309, the figures related to Smyrna cotton.

Ibid., p.293; H. of C. Journals, XXVI, p.218 (6 May, 1751).

NAS, Board of Manufactures, Custom House Returns, NG 1/16/1, f.18, ‘Account of the quantities of Foreign Linen Yarn imported into England from Christmas 1740
to Christmas 1753’, ‘Account of the quantities of Yarn Spruce or Muscovia and Irish Yarn imported into England from Christmas 1740 to Christmas 1753 Reduced into pounds’.

lxiii  Calculated from Wadsworth and Mann, The cotton trade and industrial Lancashire, p.521.


lxv  Wadsworth and Mann, The cotton trade and industrial Lancashire, pp.156-8, Touchet, they note, was prominent in the Africa trade; Inikori, Africans and the industrial revolution, p.444.


lxvii  Burn, Statistics of the cotton trade, p.11. In the early 1730s, the price of cotton yarn fluctuated between 2s 2d and 2s 4d per lb. By 1752, the price exceeded 4s 5d.

lxviii  Wadsworth and Mann, The cotton trade and industrial Lancashire, p.79, for the picture in the seventeenth century. By the middle of the eighteenth century, the area between Manchester, Stockport, and Ashton-under-Lyne had developed the
production of cotton-linen mixtures. See also, Walton, ‘Proto-industrialisation and the first industrial revolution’.


lx Wadsworth and Mann, The cotton trade and industrial Lancashire, pp.275, 472.

lxii Gentleman’s Magazine, LVII (1787), pp.665-6, 1165-7; Chadwick, Reminiscences of Mottram, pp.24-30; Middleton, Annals of Hyde and district, pp.309-12; Espinasse, Lancashire Worthies, pp.315-16; Aiken, A description of the country, pp.466-8; the entry in Mottram’s burial registers (12 May, 1767) relating to Earnshaw identifies him as an ‘Ingenious man of Mottram’, Cheshire Record Office, Mottram in Longdendale Parish Registers, MF 41/1, Mottram in Longdendale Parish Registers.

lxiii Gentleman’s Magazine, LXXXIII (1813), p.662.

lxv Rose, ‘Early cotton riots in Lancashire’; Aspin, ‘New evidence on James Hargreaves and the spinning jenny’, p.121; The trial of a cause, p.98.

lxiv BL, Add MS 32,855, Newcastle Papers, fos.504-10, J. West to Newcastle, 13 June, 1755; National Library of Scotland, MS 16,684, Saltoun Manuscripts, f.151, William Tod to Lord Milton, 17 April, 1753; f.152, Tod to Lord Milton, 1 May, 1753; f.155, Tod to Lord Milton, 24 May, 1753; 16693, f.159, Tod to Milton, 10 April, 1755.

Muniments, GD 248/954/2/3, pp.9-10, in which spinning was seen to be ‘the most effectual means hitherto found out for Introducing Industry among an Uncivilized People’ and the warning was made that without that industry ‘The Highlands will soon Return to the Idle Thieving and Rebellious State that they were in Ten years ago’; Harris, ‘The Scots, the Westminster parliament, and the British state’, pp.135-6.


Ibid., pp.481-2 (petitions from Bolton, Manchester, Stockport, Mere, Wigan).

PRO, Chatham Manuscripts, 30/8/81, ‘Reply to the Case of the Manufacturers of Lawns and Cambricks’, p.259; NAS, Seafield Muniments, GD 248/954/2/4, ‘Observations upon A paper, intituled, General Reasons against lowering the Duties upon Foreign Yarn’, p.3.


NAS, Board of Manufactures, Custom House Returns, NG 1/16/1, f.16, ‘An Account of the quantity of Foreign raw Linen Yarn and Spruce or Muscovia Yarn imported into that part of Great Britain called England from Christmas 1748 to Christmas 1753 Distinguishing each year, the places from whence imported and the Duties paid thereon’; f.19, ‘An Account of the Quantities of Raw Linen Yarn Imported into England from Christmas 1758 to Christmas 1765 distinguishing each Country and each Year’.
Calculated from Wadsworth and Mann, *The cotton trade and industrial Lancashire*, p.521.

NAS, Board of Manufactures, Custom House Returns, NG 1/16/1, fos.18-19, ‘Account of the quantities of Foreign Linen Yarn imported into England from Christmas 1740 to Christmas 1753’; ‘Account of the quantities of Yarn Spruce or Muscovia & Irish Yarn imported into England from Christmas 1740 to Christmas 1753 Reduced into pounds’; ‘An Account of the Quantities of Raw Linen Yarn Imported into England from Christmas 1758 to Christmas 1765 distinguishing each Country and each Year’.

Exports of both Irish yarn and cloth increased by approximately one-third over the seven years of war. Calculated from Gill, *The rise of the Irish linen industry*, pp.341-2.

NAS, Board of Manufactures, NG 1/1/15, minutes of Trustees’ meetings, 10 July, 1760.

O’Mordha, ‘The linen industry in the Clones area’, p.147; Anon., *The following papers, collected and seriously deliberated upon, by a number of linen-drapers, p.16; ‘C.S., Merchant’, *Informations to the people of Ireland*, p.16.


NAS, Court of Session Papers, CS 96/3058, Watson and Anderson, merchants of Cullen, Spinning Book, 1759-66. The authors are grateful to Stuart Nisbet for bringing this category of records to their attention and extend their thanks to all scholars who responded to their queries concerning the possible survival of yarn price data.

NAS, Court of Session Papers, CS 96/3061, James Anderson of Leith, Yarn Book, June 1762 to January 1764.
Reports from committees of the House of Commons, III, 1773 committee, p.110, Rayment cited a figure of 2s 10d per spangle, which compared with one of 2s 0.5d in 1751, Reports from committees, II, 1751 committee, p.290.

Structural constraints on output around mid-century, related to the supply of land and labour, are noted in Collins, ‘Proto-industrialization and pre-famine emigration’, p.131.

Stephenson, An inquiry into the state and progress of the linen manufacture, pp.21, 95; Anon., Copies of the several memorials presented to the linen board; Anon., Observations on the several matters offered to the linen board, pp.13, 20-1.

Anon., Copies of the several memorials, pp.14-15; for legislation designed to ensure quality control, see The statutes at large, passed in parliaments held in Ireland, vol.VII, 1749-1761, 31 Geo.II, c.10; 31 Geo.II, c.17; 33 Geo.II, c.5; vol.VIII, 3 Geo.III, c.34.


Schumpeter, English overseas trade statistics, Table XXXVII, p.67.

‘A Friend of the Poor’, Thoughts on the use of machines, in the cotton manufacture, p.13.

Ibid., p.12.

Precedents and abstracts from the journals of the trustees of the linen and hempen manufactures of Ireland, entry for 19 Jan., 1723.

Stephenson, Observations on the present state of the linen trade of Ireland, p.ix.

Gee, Observations on the growth of hemp and flax in Great Britain, p.15.

NAS, Board of Manufactures, NG 1/1/17, minutes of Trustees’ meetings, 27 April, 1763.

cii All figures calculated from Wadsworth and Mann, *The cotton trade and industrial Lancashire*, p.521.

ciii See above p..


cv Calculated from Wadsworth and Mann, *The cotton trade and industrial Lancashire*, p.521. See also Atwood, *The history of the island of Dominica*, pp.83, 104.

cvi Calculated from Wadsworth and Mann, *The cotton trade and industrial Lancashire*, p.521. The annual average rose from 3,061,000 lbs. in the first half of the decade to 4,302,810 lbs. in the second. *The statutes at large*, vol.6, pp.707-12

cvii On Hargreaves, see Aspin and Chapman, *James Hargreaves and the spinning jenny*, pp.9-12; Aspin, 'New evidence on James Hargreaves'.

cviii Arkwright’s interest provides stronger evidence for the interest in spinning improvements than does the number of innovations essayed in the period. Hargreaves’ and Arkwright’s machines were the only spinning patents taken out over the decade. A further eight improvements to the spinning wheel were brought forward in the 1760s, all in response to a premium offered by the Society for the Encouragement of Arts, Manufactures and Commerce, see Royal Society of Arts, Ad Hoc Committee minutes, 6 May 1760. This offer was general in nature and appears to have been
unrelated to developments in the cotton industry, see Griffiths, Hunt and O’Brien, ‘The curious history’, p.121.

cix Fitton, The Arkwrights: spinners of fortune, pp.6-7, 9; Arkwright’s business plate offered work 'In the Neatest and Best fashion. Makes all sorts of Perukes, Ladies Tates and Locks. Where also may be had ready made Several sorts of Cut, Curl, Scratch, Dress, Bob Perukes at Reasonable Rates', Manchester Guardian, 23 Dec., 1932.

cx The trial of a cause, p.63, evidence of John Kay. Arkwright is said to have observed ‘that will never be brought to bear, several gentlemen have almost broke themselves by it’.


cxii The trial of a cause, pp.172-3, Mr Justice Buller’s summing up; Hewish, Prejudicial and inconvenient?

cxiii Wadsworth and Mann, The cotton trade and industrial Lancashire, p.477n; in evidence to Parliament in 1774, Arkwright’s partner Jedediah Strutt stated that the company was producing plain and printed cotton stuffs with warp made from cotton-wool, H. of C. Journals, XXXIV, pp. 708-9 (6 May, 1774).

cxiv H. of C. Journals, XXXIV, p.598 (28 March, 1774). The campaign had commenced a year earlier, see pp.204-334 (17 March- 25 May, 1773); 469-670 (17 Feb.- 22 April, 1774).

cxv Ibid., pp.496-7 (25 Feb., 1774); Fitton, The Arkwrights, pp.27-8; Fitton and Wadsworth, The Strutts and the Arkwrights, pp.60-75.
British goods were to be identified by the inclusion of three blue threads in the selvage and a stamp bearing the words ‘British Manufactury’, Fitton and Wadsworth, The Strutts and the Arkwrights, p.71.

Calculated from Wadsworth and Mann, The cotton trade and industrial Lancashire, p.521; Gill, The rise of the Irish linen industry, p.342; legislation was secured just over three months after Arkwright’s original petition, H. of C. Journals, XXXIV, pp.794-5, 805 (1, 7 June, 1774).

Manchester 200 years ago, p.29.

Lemire, ‘Transforming consumer custom’.

Cannadine, The present and the past in the English industrial revolution'; Berg and Hudson, 'Rehabilitating the industrial revolution'; Temin, 'Two views of the British industrial revolution'.


The trail of a cause, p.100; Fitton, The Arkwrights: spinners of fortune, p.34.


Table One: Retained Cotton-Wool Imports and Irish Linen-Yarn Exports, 1713-52 (quinquennial averages)

<table>
<thead>
<tr>
<th>Years</th>
<th>Cotton Wool</th>
<th>Linen Yarn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>000 lbs</td>
<td>Index Number</td>
</tr>
<tr>
<td>1713-16</td>
<td>1462.5</td>
<td>100</td>
</tr>
<tr>
<td>1717-21</td>
<td>1652.8</td>
<td>113</td>
</tr>
<tr>
<td>1722-6</td>
<td>1618.8</td>
<td>110.7</td>
</tr>
<tr>
<td>1728-32*</td>
<td>1347.4</td>
<td>92.1</td>
</tr>
<tr>
<td>1733-7</td>
<td>1695</td>
<td>115.9</td>
</tr>
<tr>
<td>Year</td>
<td>Total</td>
<td>Irish</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>1741</td>
<td>3,249,348</td>
<td>2,095,034</td>
</tr>
<tr>
<td>1742</td>
<td>2,825,788</td>
<td>1,626,845</td>
</tr>
<tr>
<td>1743</td>
<td>3,354,757</td>
<td>1,930,566</td>
</tr>
<tr>
<td>1744</td>
<td>4,207,043</td>
<td>2,753,665</td>
</tr>
<tr>
<td>1745</td>
<td>5,211,698</td>
<td>3,292,537</td>
</tr>
<tr>
<td>1746</td>
<td>4,292,330</td>
<td>3,172,511</td>
</tr>
<tr>
<td>1747</td>
<td>4,753,999</td>
<td>3,529,536</td>
</tr>
<tr>
<td>1748</td>
<td>3,858,623</td>
<td>2,195,422</td>
</tr>
<tr>
<td>1749</td>
<td>4,336,157</td>
<td>2,929,200</td>
</tr>
<tr>
<td>1750</td>
<td>4,801,039</td>
<td>3,264,854</td>
</tr>
<tr>
<td>1751</td>
<td>4,774,825</td>
<td>2,732,738</td>
</tr>
<tr>
<td>1752</td>
<td>5,234,659</td>
<td>2,795,384</td>
</tr>
<tr>
<td>1753</td>
<td>5,924,167</td>
<td>2,695,936</td>
</tr>
<tr>
<td>1759</td>
<td>5,098,934</td>
<td>3,690,914</td>
</tr>
</tbody>
</table>


*1727 has been omitted, as the figures for cotton-wool imports that year are missing.*
<table>
<thead>
<tr>
<th>Year</th>
<th>Total Imports</th>
<th>Yarn Spruce or Muscovia</th>
<th>Yarn Imported</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1760</td>
<td>5,298,580</td>
<td>3,560,723</td>
<td></td>
<td>67.2</td>
</tr>
<tr>
<td>1761</td>
<td>5,287,868</td>
<td>4,005,163</td>
<td></td>
<td>75.7</td>
</tr>
<tr>
<td>1762</td>
<td>5,035,495</td>
<td>3,903,464</td>
<td></td>
<td>77.5</td>
</tr>
<tr>
<td>1763</td>
<td>5,639,557</td>
<td>3,809,531</td>
<td></td>
<td>67.5</td>
</tr>
<tr>
<td>1764</td>
<td>4,421,406</td>
<td>2,774,100</td>
<td></td>
<td>62.7</td>
</tr>
<tr>
<td>1765</td>
<td>6,682,310</td>
<td>4,960,051</td>
<td></td>
<td>74.2</td>
</tr>
</tbody>
</table>

Source: NAS, Board of Manufactures, Customs House Returns NG/1/16/1, fos. 18-19, ‘Account of the quantities of Foreign Linen Yarn imported into England from Christmas 1740 to Christmas 1753’, ‘Account of the quantities of Yarn Spruce or Muscovia and Irish Yarn imported into England from Christmas 1740 to Christmas 1753 Reduced into pounds’; ‘An Account of the Quantities of Raw Linen Yarn Imported into England from Christmas 1758 to Christmas 1765 distinguishing each Country and each Year’.

Source for Figure One: Calculated from Gill, *The rise of the Irish linen industry*, pp.341-2.

Sources for Figure Two: Calculated from Gill, *The rise of the Irish linen industry*, pp.341-2; Wadsworth and Mann, *The cotton trade and industrial Lancashire*, p.521.