

The Industrial Revolution as a collective action problem: The House of Commons games patents of monopoly, November 1601

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Abstract

The English economy during the sixteenth century was increasingly captured by monopolists, with dire consequences in aggregate. Yet, though many Members of Parliament owned patents of monopoly, on 20 November 1601 the House of Commons agreed, with no voices raised in opposition, to void all such patents. That collective decision helped shift the English economy from a non-cooperative to a cooperative game, and thus from non-competition to competition, so taking a key prefatory step towards the English Industrial Revolution.

KEYWORDS

Darcy v. Allen, debate on monopolies 1601, economic growth, Industrial Revolution origins, patents of monopoly, Statute of Monopolies

JEL CLASSIFICATION

C70, D42, D71, D74, K00, L12, N43, O38

1 | INTRODUCTION

The fundamental insights of North and Weingast's 1989 article 'Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-century England', are (a) that successful markets are cooperative games, (b) that cooperative games are rule-bound, and (c) that institutions embody those rules. If, however, players can override the rules, the game ceases to be cooperative, and the market fails.

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No one could challenge those insights. But North and Weingast (1989) also suggested that the Glorious Revolution of 1688 and the Bill of Rights of 1689, by limiting the power of the Crown, by empowering Parliament, and by freeing the common law to enforce the rules of cooperative games, freed capital markets to generate the Financial Revolution that would go on to drive the Industrial Revolution:

... the Glorious Revolution of 1688 ... secure[d] property rights ... [its] success was remarkable, as the evidence from capital markets shows. (p. 803)

It appears that the growth of private capital markets paralleled that of public capital markets ... [which] played a necessary role in the economic expansion throughout this [eighteenth] century. (p. 828)

In 1765 ... England was on the verge of the Industrial Revolution. (p. 831)

In their article, North and Weingast acknowledged that the Glorious Revolution was only the culmination of a centuries-old process of parliamentary liberation from monarchical despotism, but they nonetheless suggested that the Glorious Revolution was the pivotal step that led to the Industrial Revolution.

Yet the factors that were to generate the Industrial Revolution were already established in England and Wales before 1688/9, and here I suggest that if there were a pivotal step (and that sort of monocausal thinking must always be problematic), it was the debate on monopolies held by the House of Commons on 20 November 1601. Certainly, the records of that debate provide a deeper insight into how the English liberated their economy than does the *deus ex machina* invocation of the invited royal invasion of 1689 by William of Orange and Mary Stuart, James II's daughter.

This article is structured as follows. Sections 2 and 3 describe the economic, technological and political advances England had witnessed before 1688. Section 4 chronicles the debate on monopolies that opened in the House of Commons on 20 November 1601. Section 5 models the debate as the resolution of a collective action problem. Section 6 shows how the common law operated in ways that cooperative games harness rules. Section 7 relates the 1624 Statute of Monopolies to the debate held by the House of Commons on 20 November 1601. Section 8 relates that debate to other cooperative resolutions of collective action problems. Sections 9 and 10 show the English elite to have been both commercial and innovative. Section 11 concludes.

2 | A CHRONOLOGY OF ENGLISH TECHNOLOGICAL AND ECONOMIC ADVANCES BEFORE 1688

Allen (2009) has reported how the population of London grew tenfold between 1500 and 1700, and he has shown that much of that growth was driven by London's expansion as a centre of trade; for example, the Royal Exchange was founded as a trading floor in 1571; and iron consumption per capita in England and Wales started to grow from c.1500 (King, 2005).

Robert Norman's description, in his 1581 book *The Newe Attractive*, of the declination of the compass (i.e. the dipping of the compass needle from strict horizontal), and William Lee's invention of the stocking frame in 1589, were both original advances that were to help launch England's, later Britain's,¹ eminence in navigation and textiles respectively.



In an era when freight charges by river were a fifth or a quarter of those by road (Bogart, 2013, p. 6), and in an era before canals, river navigation was of central importance to commerce and industry. Yet Satchell (2017, p. 13) found:

By 1600, the English and Welsh network of navigable rivers had declined in both extent and quality from its peak in the thirteenth century ... For example, whereas the Great Ouse had previously been navigable to Bedford, by 1600 vessels could only reach St Ives [about 30 miles downstream of Bedford].

The Thames, too, which was once navigable from the sea to Radcot (over 20 miles upstream of Oxford), was by 1600 navigable from the sea only as far as Burcot (over eight miles downstream of Oxford). And although there were improvement schemes during the sixteenth century – the River Lea was improved under an Act of 1571 – Satchell (2017, p. 18) reports that only after 1601 did river transport in England and Wales systematically grow:

From 1601 to 1680 the network of navigable rivers in England and Wales expanded and, for the first time, there was a growth in coal transportation via river beyond the North-East coalfield.

Willan (1964, p. 6) also found that the turn of the seventeenth century marked an inflection in English river transport. In his *River Navigation in England 1600–1750* he wrote that.

Before 1600 the attempts to improve river navigation were spasmodic, but thereafter

... took place the greatest attempt to improve the rivers of England and use them as a means of communication that has been made in the country's history.²

2.1 | Research: the turning point in 1600

Although Norman's report in 1581 of the declination of the compass was not a trivial step, England's first great contribution to research was made in 1600, when in *De Magnete* William Gilbert reported his seminal advances in the sciences of navigation, magnetism and static electricity, as well as in the use of the compass at sea.

Research, even by competitors, is a collaborative and cooperative process (Kealey & Ricketts, 2014; 2021) and – as Cormack showed in her 1997 book *Charting an Empire: Geography at the English Universities 1580–1620* – by 1600 England had already generated the research circles to nurture that collaboration and cooperation. So, as Zilsel (1941) demonstrated, Gilbert was enabled to write *De Magnete* only because he was embedded within a network of researchers, technicians and pioneers (including in navigation, mathematics and physics) with whom he exchanged news of discoveries.

Gilbert, moreover, when he published *De Magnete* was also President of the College of Physicians. The college, founded in 1518, had by the late sixteenth/early seventeenth century emerged as a leading academy of research. Its biomedicine was to be revealed as stellar when, in 1628, William Harvey, who had been the College's Censor (a senior position), published the seminal book *De Motu Cordis*, which transformed biomedical science and technology. But, as Gilbert's *De Magnete* was to illustrate, the college was stellar in physical as well as in biomedical disciplines. And in 1657 its president, Walter Charleton, was to write:



In the College of Physicians in London, (which without offence to anything, but their own Modesty, I may pronounce to be the most eminent Society of men, for Learning, Judgement and Industry, that is now, or at any time hath been, in the whole World) you may behold Solomon's House in reality. ... (p. 34)

They likewise so well understand all *Fossilia*, and the several kinds of Minerals, pretious Stones, Salts, concreted juices, and other subterranean productions; That even Lapidaries and Miners come to learn of them. We have others, who enquire into the mysteries of Refiners, Belfounders, and all others that deal in Metals. (p. 41)

Such breadth of expertise from the college was not unexpected because many of the prominent innovators of the day were medical men. So Robert Recorde (c.1512–1558), the mathematician who invented the equals sign (=) who was also the Controller of the Royal Mint and Comptroller of the Mines and Monies in Ireland, was a prominent physician who treated King Edward VI and Queen Mary (D. Smith, 1921). Burchard Kranich (1515–1578), the distinguished mining engineer and metallurgist, was also a prominent doctor who may have treated the Queen (Erickson, 1983, p. 416). But after Thomas Linacre, who – having founded the College of Physicians – proceeded, in 1524, to endow two readerships at Merton College Oxford and a lecture at St John's College Cambridge; and after Gresham's College was founded in 1597 with professorships in astronomy and geometry inter alia; and after Savile endowed chairs in geometry and astronomy at Oxford in 1617; and after the Royal Society was founded in 1660 to institutionalise a different research circle from that of the College of Physicians; and after the building of the College of Physicians was lost to the Great Fire of London of 1666 – the College began to lose its interdisciplinary research pre-eminence (Webster, 1967). But that loss was only relative, for it reflected the rise of other institutions of research in England.

2.2 | Energy: The inflection c.1601

Warde (2007, pp. 131–3) has chronicled energy consumption per capita in England after 1560. He found that it fell from 20.0 gigajoules per year in 1560 to 17.2 gigajoules per year in 1601. During the last four decades of the sixteenth century, therefore, the market in energy failed to sustain pre-existing levels of per capita energy consumption.

But Warde also found that per capita energy consumption in England started to grow after 1602, and that it had increased by 70 per cent by 1688 (pp. 131–3). The increase was achieved primarily by a 5.4-fold increase in the consumption of coal (pp. 115–17), and in a challenge to the view that the Industrial Revolution post-dated 1688, Warde (p. 61) commented that these findings are not readily compatible with “a supposedly ‘pre-industrial economy’”.³

2.3 | Patents for invention: The turning point in 1603

The research culture that England had developed by the turn of the seventeenth century was commercial as well as academic. So in 1603 the issuance of patents for inventions was institutionalised by the creation of the Commissioners for Suits; and, in his study of Francis Bacon's career, Pastorino (2017) has chronicled how, during the ten years 1607–17 when Bacon



was a Commissioner for Suits, Parliament issued 40 patents for invention for advances in a range of technologies including for: the making of copper by dissolution; water mills; water pumps; the tillage of seeds; the conversion of iron into steel; the making of salt; and the making of glass by sea coal and pit coal.

Pastorino, moreover, argues that Bacon's appreciation of the scientific method emerged from his study of research in commerce: that is, Bacon urged the universities to do research because he had seen how effective it was in business. This was why Pastorino subtitled his paper 'Francis Bacon's Notion of Experiment and its Debt to Early Stuart Inventors'. Harkness agrees, and in her *The Jewel House* (2007, pp. 211–53) she shows how London, by the beginning of the seventeenth century, was a ferment of privately funded research and development. She suggests that Bacon was no prophet of the scientific revolution but, rather, only a proselytiser of current practice.

2.4 | The growth in productivity and in GDP per capita antedated 1688

In their analysis of the labour demand curve, Bouscasse et al. (2021, p. 35) challenged the idea of the Glorious Revolution as launching growth in productivity, because they found that, in England:

... productivity growth started in 1600 ... These results indicate that sustained growth in productivity started well before the Glorious Revolution. They point in particular to the early 17th century as a crucial turning point for productivity growth in England.

Apostolides et al. (2008), on analysing their Medieval Agricultural Database and their probate inventories, date the increase in productivity per worker in the largest of England's industries, namely agriculture, to a later date, namely circa 1650, but still before 1688. Moreover, both Broadberry et al. (2015) and the Maddison Project (Bolt et al., 2018) find that GDP per capita started to rise in England around 1650 – that is, before 1688.

2.5 | The Financial Revolution: The turning point before 1688

In an article subtitled 'The Financial Revolution Revisited', Sussman (2022) showed that, before the Glorious Revolution, interest rates in London declined in parallel with those in Amsterdam, then the leading financial centre; and that the 1660 Restoration (i.e. of the English monarchy after the 11-year Interregnum), not the Glorious Revolution, represents a more significant pivot in the development of the English Financial Revolution.

2.6 | How relevant was the Financial Revolution to the Industrial Revolution?

Deane (1979, pp. 165–82) questioned the importance of the Financial Revolution to the Industrial Revolution by showing that early industrial inventors and innovators depended for their capital largely on personal savings, personal loans, and on the reinvestment of profits.



Deane took many of her examples from the eighteenth and nineteenth centuries, and this article identifies the seventeenth century as a key pro-Industrial Revolution century but, as will be seen below, many of that century's technical advances were led by the social elite rather than by workers, and they too depended for their capital largely on personal wealth and on the reinvestment of profits.

3 | A CHRONOLOGY OF ENGLISH POLITICAL ADVANCES BEFORE 1688

These economic and technological developments are not necessarily surprising because they track a series of political developments, which in Cox's terminology (2012) might be termed structural breaks, which helped free markets. As long ago as c.600 King Æthelbert of Kent had proclaimed his Law Code, which invoked the concept of the rule of law; in c.890 Alfred the Great had consolidated his laws in his Doom Book; and in 1100 Henry I had conceded the Charter of Liberties. These progressive extensions of the rule of law were to reach an early culmination in the signing in 1215 of Magna Carta, some of whose clauses are still extant, including an early defence of human and property rights:

XXIX No free man shall be seized or imprisoned, or stripped of his rights or possessions ... except by the lawful judgement of his equals or by the law of the land

and an early defence of markets:

XIII The City of London shall have all its ancient liberties and free customs, both by land and by water.

Magna Carta also stated that

XII No 'scutage' or 'aid' [taxes] may be levied in our kingdom without its general consent ...

XIV To obtain the general consent of the realm for the assessment of an 'aid' ... or a 'scutage', we will cause the archbishops, bishops, earls, and greater barons to be summoned ... (Magna Carta, 1215)

Consequently, as Macfarlane (1978, p. 268) noted:

England was as 'capitalist' in 1250 as it was in 1550 or 1750. That is to say, there was already a developed market, mobility of labour, land was treated as a commodity, and full private ownership was established, there was very considerable social and geographical mobility, a complete distinction between farm and family existed, and rational accounting and the profit motive were widespread.

Clark (1996, pp. 564–5), moreover, on chronicling contemporary transactions, confirmed that property rights in land were secure by 1540 if not earlier – certainly before 1688:



... data about the return on capital and about land prices ... show that secure property rights existed in England as early as 1600, and probably much earlier. As far as most private investors were concerned, nothing special happened in 1688 ...

The “archbishops, bishops, earls, and greater barons” to whom Magna Carta referred were a very select group, but in 1265 Simon de Montfort called a parliament that included representatives of both the counties and towns, and by 1295 the Model Parliament had started to acquire rights over ‘supply’ (i.e. taxes). In 1407 Henry IV conceded that the Commons did indeed have rights over supply; and in 1414 the House of Commons declared to Henry V that it was “as well assenters as petitioners” in government (Johnson, 1864, p 242).

Contemporaries understood the link between political and economic events. Thus in 1470 Sir John Fortesque in his *De laudibus legume Angliae* could describe England as a political and regal kingdom of limited, not absolute, monarchy, where the House of Commons exercised veto powers over taxation, which – as Sir John elaborated in his *Governance of England* of 1471 – allowed even common people in England to be prosperous. By contrast, absolutist kings in France could

set tailles [taxes] and other impositions upon the commons without the consent of the three estates [of parliament].

Consequently

the French kings have yearly sithen [set] such charges upon them ... as the same commons be so impoverished and destroyed that they may uneath [hardly] live ... they eat no flesh ... they wear no woollen ... their wives and children go barefoot. Verily, they live in the most extreme poverty and misery, and yet dwell they on the most fertile realm of the world. (Craik, 1916)

To summarise: the picture that emerges is of a nation that started to liberalise politically long before 1688, which in consequence had started to grow economically and technologically before 1688. Moreover – as judged by England’s productivity, research, energy consumption per capita, and river sector in toto – c.1600 emerges as a pivotal time. This article identifies the debate on monopolies in the House of Commons of 20 November 1601 as a significant political event that helped shift the English economy away from non-cooperation into cooperation, and thus from non-competition to competition, thus helping to enable the Industrial Revolution.

4 | THE HOUSE OF COMMONS DEBATES MONOPOLIES

There is a long history of monopoly in England because medieval economic thinking encompassed ideas of fairness to producers: if a person had made an investment in a mill, was it fair that their investment could be depreciated by the appearance of a new, competing, mill (Hills, 1994, pp. 37–8)? Mercantile thinking, moreover, encompassed ideas of import substitution, so rulers sought, by the provision of monopolies, to encourage the immigration of foreigners skilled in foreign technologies (Federico, 1929).

By the reign of Queen Elizabeth I (1558–1603), however, the issuing of patents of monopoly was no longer being justified solely by ideologies of fairness to producers or of mercantilism. Rather, the issuing of patents of monopoly was repurposed: in Davies's words (1932, p. 396):

... the Patent System was introduced into England *as a system* in the second year of Elizabeth's reign [1561]. (capitalisation and emphasis in the original)

In Pastorino's words (2009, p. 647):

Initially introduced to favor the growth of new industries and technologies in England and to increase state revenues, Elizabeth's granting system expanded to include licenses for ordinary industries ...

Which led the Queen into selling patents of monopoly for entire, pre-existing, industries.⁴

Such sales were predictably distorting, as was illustrated by the salt patent: on 21 November 1601 Sir Edward Hobbie MP reported to the House of Commons that

... where Salt, before the Patent [of 1585], was wont to be sold for Sixteen pence a Bushel, it is now sold for Fourteen or Fifteen shillings a Bushel [an 11-fold increase in price]. (d'Ewes, 1662, p. 647)

Not only did the purchasers of such monopolies impoverish their customers, but they would often displace the pre-existing producers, thus driving them into destitution when destitution could presage death by hunger and exposure.

Eventually, Elizabeth's sales of monopolies threatened the incomes even of monopoly-holders: if you held the monopoly on valuable product A, but if others held the monopolies on valuable products B to Z, then even you could be impoverished. And the number of patents Elizabeth sold was extensive. On 25 November 1601 Robert Cecil MP, the Secretary of State, listed some of them in the House of Commons (Table 1).

Two days earlier, on the afternoon of 23 November, the Committees of Monopolies and Patents of Privilege had enumerated a similar roll, though also listing patents for the printing of school books, the printing of songs, and the export of steel (d'Ewes, 1662, p. 650). Yet, as Price was to enumerate (1906, pp. 142–53), those were only the monopolies that were acknowledged in the House of Commons, and Cecil kept a further discreet list of patents of monopoly (Table 2).

By November 1601 the only important commodity that had not been monopolised in England was grain (Clark, 2014). During the debate on patents in the House of Commons on 21 November 1601, Mr Hackwell MP asked “Is not bread there?” (that is, on the list of monopolies). But his was a rhetorical question, which he answered equally rhetorically with “No, but if order be not taken for these, bread will be there before the next parliament” (d'Ewes 1662, p. 648). An imperative of medieval and Tudor government was to provide bread for all, so monopolies in it were unconscionable: it was precisely because the grain market was, in Clark's words, “the most important of all markets” (2014, p. 1) that governments allowed it to operate more freely than any other.

But grain was the only significant exception in an economy that had otherwise been monopolised, and on 20 November 1601, as members of parliament opened the debate on monopolies, feelings ran high. Francis Moore MP condemned monopolies that “bringeth the general



TABLE 1 The patents of monopoly that Elizabeth I had sold, as disclosed to the House of Commons on 25 November 1601 by Robert Cecil MP, the Secretary of State, in the order Cecil gave

salt	horns
aqnavitæ (<i>sic</i>) & aqua composita (distilled spirits)	starch
vinegar	new drapery
salted and packed fish	Irish yarn
vegetable and animal oils including from whale blubber	calf-skins
brushes	pelts
pots	steel
bottles	leather
pouldaveries (canvas)	playing cards
	glasses
	saltpetre

Source: d'Ewes (1662, pp. 652–3)

profit into a private hand” and so reduce the nation to “Beggery and Bondage”. Mr Martin MP condemned the holders of patents as “blood-suckers” of a country that “groaneth and languisheth under the burthen of monstrous and unconscionable ... Monopolitans”. Sir George Moore MP spoke of “This eating and fretting Disease of Monopolies ...”; even Mr Francis Bacon MP (later to be Sir Francis Bacon, and a great defender of monarchical perquisites) conceded that certain monopolies were “hateful”, and MP after MP spoke of the “grief” the Queen’s “odious” letters patent were bringing on the nation (d'Ewes, 1662, pp. 644–54).

But because so many MPs themselves owned monopolies, the Commons was hamstrung: members wanted the Queen to withdraw others’ monopolies while she preserved their own. So, for example, during the debate of 20 November, Sir Walter Raleigh MP (after whom the capital of North Carolina is named, and who owned, amongst others, lucrative monopolies on tin and playing cards) was the only MP to defend patents for monopoly. He argued that whereas other people’s were damaging, his own on tin was of public benefit, especially for his workers:

before the granting of my Patent ... the Poor Workmen never had above two shillings the week ... But since my Patent ... they have four shillings a week.
(d'Ewes, 1662, p. 646)

Yet Raleigh knew that his own patents were as damaging as other people’s (he admitted that his patent on tin had driven up its price from “... seventeen shillings and so upward to fifty shillings a hundred[weight]” (d'Ewes, 1662, p. 646); and when his monopoly over playing cards was named on the floor of the Commons, Raleigh – in the words of Parliament’s reporter – “blusht” (d'Ewes, 1662, p. 645).

Yet towards the end of the debate on 20 November 1601, Raleigh made one of the most consequential offers ever to have been made in the Commons: “if all others may be repealed, I will give my consent as freely to the cancelling of this [i.e. he’d surrender his monopoly on tin if all the other monopolists surrendered theirs].” Not surprisingly, Parliament’s reporter wrote of “the great silence” that fell on the House of Commons after Raleigh’s offer (d'Ewes, 1662, p. 646).

TABLE 2 The patents of monopoly that Elizabeth I had sold but which Robert Cecil MP, the Secretary of State, did not disclose to the House of Commons on 25 November 1601

the trade in wool (wool then being England's leading industry)	woad	the transport of corn
linen	pilchards	currants
lead	fish livers	ox bones
coal	currants	soap
beer	(gun) powder	Spanish wool
aniseed	horns	dice
sulphur	ashes	the tanning of leather
brimstone	bags	the transport of calf skins
flax	ordnance	brimstone
hemp	paper	ashes
tin	mathematical instruments	and tobacco pipes.
	iron	
	glass	

Source: Price (1906, pp. 142–53)

Arnold Toynbee, the scholar who popularised the term ‘Industrial Revolution’, wrote that:

The essence of the Industrial Revolution was the substitution of competition for the medieval regulations that had previously controlled the production and distribution of wealth. (1884, p. 58)

But as the debate in the Commons of 20 November 1601 showed, the regulations that were then impeding the production and distribution of wealth were not only medieval, they were also Elizabethan. Nonetheless, in Raleigh’s offer we witness an archetypal conversation by which the English substituted competition for regulations. Thus did the English prepare the way for the Industrial Revolution.

5 | GAMING THE HOUSE OF COMMONS ON 20 NOVEMBER 1601

Imagine a two-player market in food, where player A sells food *a* to player B, while player B sells food *b* to player A. Each food is essential to life, so commodity *a* might be apricots, containing vitamin A (vital for life), while commodity *b* might be beef containing vitamin B (vital for life).

Each player has a competitive advantage in producing their respective product. Nonetheless, at potential cost *c*, each player retains the capacity of producing the other food, so each player sells their product to the other at a price that falls just short of *c*, which in this market might be \$10 for a year’s supply. Each player, therefore, sells \$10 worth a year of their food to the other, and each therefore enjoys, on their trade in food, a net income of \$0. But each player is well-nourished.



Now imagine the Crown offers a monopoly in *a* to player A at cost \$5 per year (that is to say, B is now no longer allowed to potentially produce *a*). Player A can then charge B \$20 a year for *a* (the market is inelastic, as the food is vital for health), which provides A with a net income of \$5 a year on their trade in food (\$20 from B, minus \$5 to the Crown, minus the \$10 A pays for the *b* that A is buying as usual.) This is higher than A's original net income of \$0 a year.

Meanwhile, B is left with a negative net income of \$10 on their trade in food. So B buys their own monopoly at \$5 pa from the Crown, and charges A \$20 a year for *b*. When both players hold monopolies, therefore, each has a net income of minus \$5 a year (\$20 charged of the other, \$20 paid to the other, \$5 paid to the Crown.)

This is a classic prisoner's dilemma, summarised in Figure 1. Each player is enriched if they alone hold a monopoly, but each player is impoverished – even below the income they enjoyed pre-monopoly – if the other player also holds a monopoly.

There are of course many possible solutions to the collective action problem of a prisoner's dilemma. But as the House of Commons illustrated during the five-day debate of 20, 21, 23, 24 and 25 November 1601 (the 22nd was a Sunday, when the Commons did not sit), the solution the English selected during the seventeenth century was to transform the game from non-cooperation to cooperation. So the House of Commons united behind Raleigh, and everyone agreed to forgo their patents.

The news of this unopposed agreement was conveyed to the Crown, which was wise enough to yield to *force majeure* (a monarch of the succeeding Stuart dynasty might have resisted), and on 25 November the Speaker, in a dramatic speech – “every man marvelling” (d'Ewes, 1662, pp. 651–2), informed the Commons that the Queen had conceded that, of the patents of monopoly ...

... some should be presently repealed, some suspended, and none put in Execution, but such as first should have a Tryal according to the Law for the good of the people.

As dramatically, the Secretary of State, Robert Cecil MP, then told the House that no more use would be made of “Letters of Assistance from her Majesties Privy Council” (see below). On 27 November, moreover, Cecil told the Commons that “Though the Idol of Monopoly be a great Monster, yet after two or three days I doubt not but you shall see him dismember'd”, and the culmination of this drama indeed came three days later, on 30 November, when Her Majesty herself, in the Council Chamber at Whitehall, before a large group of MPs (141, about half the membership of the Commons), delivered a comprehensive mea culpa in which she apologised for having “fallen into the Lap of Error, only for lack of true Information”. She “never was any greedy, scraping Grasper ... My heart was never set on Worldly Goods”, but unfortunately

		Player B	
		<i>No monopoly</i>	<i>Monopoly</i>
Player A	<i>No monopoly</i>	0, 0	–10, 5
	<i>Monopoly</i>	5, –10	–5, –5

FIGURE 1 Monopolists' prisoner's dilemma



“Varlets and lewd persons, not worthy the name of Subjects” had misled her into “Envy, Peril, Dishonour, Shame, Tyranny and Oppression”, which were alien to a monarch who could not have been “more Careful and Loving” (d'Ewes, 1662, pp 659–60).

6 | THE LAW

The decisions of the Crown-in-Parliament in November 1601 can be modelled as transitioning the right to trade goods in England from a non-cooperative into a cooperative game, for the speeches of both the Speaker and of Her Majesty's Secretary of State invoked the law in the ways that cooperative games harness rules. Thus Cecil, for example, in his speech of 25 November, on enumerating a long series of patents that would be voided, explained successively that each monopoly would thereafter apply only if it were: “... agreeable to the Law ... not restrained by Law or Statute ... suspended and left to the Law ... suspended and left to the Law ... suspended if the Law do not Warrant it ... suspended and tryable by the Common Law ... left to the Law” (d'Ewes, 1662, pp. 652–3), and the Speaker (above) made similar references to the law.

Nonetheless, Parliament did not enact legislation to place patents of monopoly under the control of new laws: rather, the Crown-in-Parliament placed patents under the control of the pre-existing common law. The common law had long found the Crown's sales of patents of monopoly for pre-existing industries to be illegal if such sales (as they generally did) displaced pre-existing workers from their employment. So, to bypass the common law, the Crown would issue ‘writs of assistance’, which transferred legal challenges to patents of monopoly from common law courts (such as the King's Bench) to the conciliar courts, which followed the Monarch's wishes (Holdsworth, 1945, pp. 347–8). The conciliar courts would then overrule challenges to the patents of monopoly Elizabeth had sold – hence the centrality of Cecil's telling the House that no more use would be made of “Letters of Assistance from her Majesties Privy Council” (d'Ewes, 1662, p. 652).

So, though the decisions of the Crown-in-Parliament in November 1601 represented the transition of the right to trade goods in England from a non-cooperative into a cooperative game, that transition was achieved not by new legislation but, rather, by the Crown agreeing to no longer block access to a common law that was already long versed in administering the rules of a cooperative game.

The common law was soon tested when, in 1602, Sir Edward Darcy, to whom Elizabeth had in 1598 sold a patent of monopoly on playing cards (Tyacke, 2007, p. 16, suggests that Darcy and Raleigh, who were relatives and who lived in the same house, shared the patent), sued Thomas Allen, who had started to manufacture and sell his own playing cards. But in *Darcy v. Allen* (decided in 1603), the Court of King's Bench – citing not only the precedents of the common law but also the Queen's claim on 30 November 1601 of having been deceived by patent-hunters – ruled for Allen against Darcy.⁵

7 | THE 1624 STATUTE OF MONOPOLIES

The legislative story did not actually start in 1601, because Parliament had long protested against the Crown's sales of patents of monopoly. The Commons had held debates on them in 1566 (only five years after the Crown's repurposing of the patents system in 1561), 1571 and 1597. Although comprehensive records do not survive of the 1566 and 1571 debates, we know



that on 7 April 1571 (only ten years after the Crown's repurposing of the patents system) a bold MP, Mr Robert Bell, had complained that "by lycences a few were enriched and the multitude impoverished" (d'Ewes, 1662, p 158). And since the Commons had the right to withhold taxes (the right to agree to 'subsidy'), Bell had suggested that only "... if remedy were provided, then would the Subsidy be paid ...". For this threat he was rebuked so savagely by the Queen's Privy Council that, as Mr Peter Wentworth MP was to report, "he came into the House with such an amazed countenance that it daunted all the House in such sort that for ten, twelve or fifteen days there was no one in the House that durst deal in any matter of importance" (Guizot, 1856, p 440).

By 1597, however, Parliament had become, collectively, so censorious that the Queen, in response, had been forced to promise to respect its concerns, and the Lord Keeper of the Privy Seal, speaking on her behalf, had said

... touching the monopolies, her Majesty hoped that her dutiful and loving subjects would not take away her prerogative, which is the chiefest flower of her garden and the principal and head pearl of her crown and diadem; but that they will rather leave that to her disposition and as her Majesty hath proceeded to trial of them already; so she promiseth to continue that they shall all be examined to abide the trial and true touchstone of the law. (Dent, 2009, p. 426)

But by 1601 her dutiful and loving subjects recognised that she had misled them, that she had continued to sell damaging monopolies, and that she had continued to issue writs of assistance that transferred private challenges to patents of monopoly from the common law courts to the conciliar courts. Hence the parliamentary crisis of 1601.

Elizabeth defused the crisis in her speech of 30 November 1601 (which is often known as the 'Golden Speech' because it was a masterwork of compromise) in which she thanked the Commons for having just voted her with 'supply' ("What you do bestow on me": d'Ewes, 1662, p. 659) before, as a quid pro quo, promising not to sell any more patents of monopoly nor issue any more 'writs of assistance'. But the monopoly story did not end in 1601 because, though Elizabeth had voided many of her patents, she had not surrendered the Crown's rights to issue them – so, even in 1601, an exception was made for saltpetre (potassium nitrate) which as an ingredient of gunpowder was viewed as a strategic asset and thus remained a Crown-supervised monopoly – and her successor, James I, started to sell them again, including a particularly egregious one on soap.

Consequently, in 1610 James was pressurised by Cecil into putting his name to the *Book of Bounty* (Davison, 1973), in which he purported to believe that all monopolies flouted the law of the Kingdom except for those concerning

Projects of new invention, so they be not contrary to the Law, nor mischievous to the State, by raising prices of commodities at home, or hurt of trade, or otherwise inconvenient. (Fisher, 2011, p. 77)

But as Levy recounted (1909, p. 30), in 1622 James nonetheless sold a patent in soap for which, by the 1630s, a group of courtiers was paying his successor, Charles I, £33,000 annually. Which the courtiers could afford because, having driven out the original manufacturers (many of whom were imprisoned by the Star Chamber, a conciliar court, for resisting the loss of their livelihood), they raised the price of soap from 2d to 12d a pound.

Enraged by the perennial abuses, Parliament in 1624, under the leadership of Sir Edward Coke, finally enacted legislation, and it pressured James – who recognised the need to compromise with the House of Commons (Kyle, 2007) – to sign the Statute of Monopolies, which formalised the agreement that Elizabeth had made with the House of Commons in November 1601. But that statute is not, however, always recognised for what it did – namely, to consolidate Parliament's denial in 1601 of the monarch's issuance of patents of monopoly (except for inventions and foreign trade; see below). Rather, the statute has sometimes been misunderstood as having institutionalised the issuance of patents of monopoly for inventions, which in turn helped power the Industrial Revolution.

This is another argument that can be traced back to North and others. North and Thomas (1970) argued that the launch of the Industrial Revolution had been delayed by the

inability of an entrepreneur to capture the gains from an innovation without the legal protection of intellectual property. (p. 6),

which had been alleviated only when

The granting of monopoly privilege by the Elizabethan crown ... gradually evolved into a patent system embedded in the legal structure of English common law in the Statute of Monopolies of 1624. (pp. 14–15),

which

encouraged the growth of innovation. (p. 16)⁶

Yet the Statute of Monopolies did not institutionalise the issuance of patents for invention for, as was noted above, that issuance was institutionalised in 1603 when James I established the Commissioners for Suits to examine applications for patents of invention.

The establishment of the Commission had been inspired by the debate in the House of Commons of 20 November 1601, at which Francis Bacon had said:

If any man out of his own Wit, industry or indeavour finds any thing beneficial for the Common-Wealth, or bring in any new Invention, which every Subject of the Kingdom may use; yet in regard of his pains and travel therein, her Majesty is perhaps pleased to grant him a privilege to use the same only by himself or his deputies for a certain time. This is one kind of Monopoly ... (d'Ewes, 1662, p. 644)

Which was an argument with which English people had been familiar ever since Thomas Smith, in his 1581 *A Discourse of the Common Weal of this Realm of England*, had described the Venetian system of patents for inventions.

Under the Commissioners for Suits, the issuing of patents for inventions anticipated modern practice:

1. The Commissioners for Suits were not only lawyers but also technical specialists: "... those that may have some particuler interest in the same ..." (James I, 1610, p. 9).
2. Applicants for patents for invention would submit models and written descriptions of their inventions as proof of novelty.



3. The models and descriptions would be made public: so, for example, a patent for a water pump was made conditional “whereof they shall exhibit a model as aforeside” (Royal Proclamation, 1612).
4. And patents of monopoly would be time-limited: so, for example, in February 1614 Edmund Brunt received a privilege “of 21 yerres of the benefit of a new invencion for dressing and boulding of meale according to a modell w^{ch} is to be delivered His Majestie Attorney Generall [i.e. Francis Bacon]” (Signet Office Docquet Book, SO 3/5, February 1614, reproduced in Pastorino, 2017, p. 764).

7.1 | Patents for foreign trade

The second systematic exception that the Statute of Monopolies made of its general cull of patents of monopoly came in Paragraph 9 (the final paragraph), when it spared measures that had been “... erected for the maintenance, enlargement, or ordering of any trade or merchandise ...”. That exception revealed the economic thinking of the day, for trade was not only believed to require monopolistic and often quasi-military protection against foreign armies and pirates (‘trade follows the flag’, as later generations would say), but new trades were also thought not to displace existing workers in ways that the Crown’s sales of patents of monopoly in pre-existing industries did (Nachbar, 2005, p. 1338).

But by analogy with patents for invention, trade patents were often time-limited, and the initial monopoly patent of 1600 to the East India Company, for example, was limited to 15 years. Trade patents were, however, always “bitterly” resented (Russell, 1979, p. 61) and, unlike patents for invention, patents of monopoly in trade have not survived today.

7.2 | A cooperative and collectivist philosophy of governance

The final systematic exception that the Statute of Monopolies made of its general cull of patents of monopoly came in Paragraphs 7 and 9, when it spared monopolies that had been enacted by Act of Parliament or that privileged civic corporations and other collective institutions.

In so doing, the Statute was only institutionalising the practice of the common law: despite the precedent of *Darcy v. Allen*, the judiciary of the common law had continued to respect monopolies that had been issued by Act of Parliament or that had been established by custom or by civic corporations. The judiciary of the common law, therefore, was not opposed to monopolies per se but, rather, only to monopolies that had been established not by the cooperative resolution of collective action problems but by monarchical fiat (Nachbar, 2005, p. 1334).

This was a point that the monarchist Francis Bacon did not grasp, and in the House of Commons on 20 November 1601 he complained that

If her Majesty make a patent (or as we term it, a monopoly) unto any of her servants, that must go, and we cry out of it; but if she grant it to a number of burgesses or a corporation, that must stand and forsooth is no monopoly. (d’Ewes, 1662, p. 645)

But the fundamental revolution that was performed in England in November 1601 was the shifting of the resolution of a collective action problem away from the monarch towards the

cooperative institutions of Parliament and the common law. As such, it would presage many further such shifts in England over the course of the following centuries, including of course the passage of the Bill of Rights in 1689.

7.3 | The Petition of Right

The debate in the House of Commons in November 1601 also helped pave the way to the passage of the Petition of Right in 1628, but as that Petition encompassed a broader, more political agenda than did the Statute of Monopolies, it is not further discussed in this article, which is focussed on economic matters.

7.4 | Flouting the Statute of Monopolies

The passage of the Statute of Monopolies in 1624 did not arrest the crises because, even after its signing, Charles I and his *consigliere* Strafford continued to issue letters patent for, in the words of Paragraph 1 of the Statute of Monopolies, "... buying, selling, making, working or using of anything within this realm ...". Which was one reason Parliament executed them both. And which is why the monarchical sale of monopolies was finally stopped only in 1645 following Charles I's defeat, capture and eventual execution (1649).

8 | IN WHAT WAY WAS ENGLAND *SUI GENERIS*?

There was nothing unique in the debate in the House of Commons that resolved the collective action problem of patents, for the cooperative resolution of collective action problems has long been a feature of human societies: see for example the many agreements over many centuries in many continents that emerged to rule the sharing of non-excludable but rivalrous goods that Elinor Ostrom described in *Governing the Commons* (1990).

Fouquet and Broadberry (2015), moreover, have shown that there was nothing unique about the revolutionary economic growth that started in England after 1650, because England had at least two significant predecessors, namely the city states of Italy and the provinces of the Netherlands. Between 1350 and 1420 Italian GDP per capita grew at an unprecedented 0.8 per cent a year, while between 1505 and 1595 Dutch GDP per capita grew at an equally-unprecedented 1.3 per cent a year.

Common to all three sets of jurisdictions was that their economies were consciously pro-competitive. Thus de Roover (1951) reported that

In the Middle Ages, the statutes of most Italian city-states contained provisions forbidding "conspiracies," coalitions, and other combinations for the purpose of increasing the prices of commodities. Even the guilds themselves incorporated such prohibitions in their statutes ... (p. 503)

In the Low Countries ... monopolies were explicitly forbidden by the ordinances, especially by the *placard* of October 4, 1540. (p. 506)



But all three sets of jurisdictions were unusual in Europe in being in a sense ‘commercial republics’: the governments of the Italian city states, the Dutch provinces and seventeenth century England may not have been full democracies, but their governments empowered the merchant classes, and the historical record suggests that such empowerment promoted the resolution of commercial collective action problems in cooperative ways. In particular, such jurisdictions resolved the collective action problem of patents of monopoly.

In contrast, countries ruled by strong monarchs remained mired in monopolies that failed to encompass the interests of the commercial classes, at least collectively. So Spain, for example, though a major imperial power, failed to raise its GDP per capita until recent times (Fouquet & Broadberry, 2015); and Vives (1969, p. 25) has described how its economy stagnated into a mass of interlocking monopolies that blocked entrepreneurship or innovation. So, for example, Vives describes how the monarch’s sale of a monopoly in sheep empowered the sheep monopolists to override the property rights of landowners whose land might be valuable to the monopolists’ sheep, thus depriving those landowners of the use of their own land, and thus disincentivising those landowners from improving their property.

Broadberry and Wallis (2017) have shown that periods of economic growth in Europe were not limited to the examples of Italy, the Netherlands or England (though other periods were sustained for much shorter periods of time), but all such episodes – other than England’s – were eventually aborted by predators, either external ones in the form of military invaders, or internal ones in the form of rulers (see also Kohn, 2005). We can therefore see that England created its Industrial Revolution not because it uniquely forged a cooperative forum in which to resolve collective action problems, nor because that forum was uniquely empowered to implement its decisions, but rather because – being largely an island that was not only defensible but which was not existentially threatened by the only country with which it shared a land border (Scotland) – its Parliament could retain its medieval privileges in the face of monarchs who could not, as they generally did on the continent of Europe, invoke the threat of invasion to override Parliamentary deliberations and thus maintain standing armies.

Consequently, we can begin to understand why the Industrial Revolution was English: by the seventeenth century, strong parliaments had become rare in Europe (Bosker et al., 2012), yet Parliament in England had not lost its rights over supply. So on 20 November 1601 the House of Commons could exploit Elizabeth’s need for new taxes (to confront the Spanish invasion of Ireland) to enforce, as a *quid pro quo*, a collective resolution of the problem of patents. Consequently the debate on monopolies opened on 20 November 1601 after ...

... the House called for the Exchequer Bill; some said Yea, some said No, and a great Noise there was. At last Mr Laurence Hide [Hyde] said, Mr Speaker, to end this Controversie, because the time is very short, I would move the House to have a very short Bill intituled An Act for the Explanation for Common Law in certain Cases of Letters Patents. All the House cried, I, I, I [Aye. Aye, Aye]. (d’Ewes, 1662, p. 644)

Thus, under the leadership of Laurence Hyde MP did the House exploit its power over taxes to leverage a cooperative solution to the collective action problem of patents of monopoly.

9 | ENGLAND AS A ‘COMMERCIAL REPUBLIC’

It is often supposed that the English ruling classes were divorced from vulgar matters such as commerce, which – if true – would have deterred the House of Commons from concerning itself with matters of trade. But that supposition is not true: the English ruling classes could be very commercial. On 28 May 1568, for example, an early joint stock company, the Company of Mineral and Battery Works, was chartered as an iron-working and wire-pulling company, and amongst its founding shareholders were many prominent men (see Table 3).

The Society of the Mines Royal, moreover, was also chartered on 28 May 1568 (to mine and smelt in Cumberland and Wales) and its founding shareholders included Sir William Cecil, the Earl of Leicester, the Earl of Pembroke and Thomas Smythe MP (all as in Table 3), Lord Mountjoy, Sir William Wynter (Vice Admiral of England), and Lionel Duckett (Lord Mayor of London) (Carr, 1913, pp. 4–15).

The Earls of Leicester and Essex, moreover, did not just invest in ironworking companies; they themselves owned ironworks. Thus Leicester ran a blast furnace at Cleobury Mortimer during the 1560s, while Essex built three furnaces in Herefordshire and Gloucestershire during the 1590s. Other aristocratic ironworkers included the Earl of Shrewsbury (a blast furnace in Shropshire during the 1560s), the Earl of Rutland (a blast furnace at Rievaulx during the 1560s), and Sir Henry Sidney,⁸ who by 1564 was replacing his two Sussex ironworks with ironworks in Gloucestershire (Hammersley, 1973).

Messina and Abe (2022, p. 213) have noted that:

Since the early modern times, the nobility's involvement in trade, finance and brokerage was usual in many countries and cities, including at an international level.

In its appreciation of the value of commerce, the English aristocracy was no exception. As early as 1215 the Mayor of London had been selected to join the Council of Twenty Five Barons to

TABLE 3 Some of the original shareholders of the Company of Mineral and Battery Works, founded on 28 May 1568

the Duke of Norfolk
the Earl of Pembroke
the Earl of Leicester
the future Earl of Exeter
Lord Cobham
Sir Nicholas Bacon (the father of Sir Francis Bacon, who was himself to own mining shares ⁷)
Sir William Cecil (to become Lord Burghley, the most powerful man in England)
Sir Walter Mildmay (Chancellor of the Exchequer)
Sir Henry Sidney (Lord Deputy of Ireland)
Sir Francis Jobson
Sir William Garrard, Sir Rowland Hayward, Sir George Barne and Sir Richard Martin (all of whom were to become Lords Mayor of London and MPs)
Peter Osborne (Keeper of the Privy Purse and MP)
Thomas Fleetwood (Master of the Royal Mint and MP)
Thomas Smythe (MP; his son was Sir Thomas Smythe, the first governor of the East India Company and the treasurer of the Virginia Company)

Source: Carr (1913), pp. 16–20



monitor the King's adherence to the terms of Magna Carta; from 1306 Mayors of London were routinely knighted; and after 1354 they were known as Lords Mayor of London. The temporal and commercial elites in England have indeed long been intertwined, which is compatible with McCloskey's argument (2006; 2010; 2016) that episodes of economic growth are associated with respect for bourgeois values.⁹

The temporal and commercial elites in England were certainly intertwined during the sixteenth and seventeenth centuries, and Brown (1890, pp. 465–70) has reported that the founding shareholders of the Virginia Company (founded in 1606; Jamestown was settled in 1607) included 100 knights (75 of whom were MPs), 58 esquires (25 of whom were MPs), and only 142 who were, in Brown's words, "citizens and others". Yet even those 'citizens and others' were not lowly or poor, because not only could they afford the shares, but eventually

a good many of them also served in parliament; some became knights, baronets, etc. (Brown, 1890, pp. 465–6)

Moreover, the Company's leading shareholder was a peer, Lord De La Warr, who was also the Governor-for-life and Captain-general of the Virginia colony (and after whom the colony, later state, of Delaware was named).

In short, the elite in England four centuries ago traded, so its cooperative resolution in the House of Commons in November 1601 of a collective action problem that impeded commerce is no surprise.

10 | THE ENGLISH ELITE AS INNOVATORY

Because four centuries ago the elite in England traded, it not only treasured national industry and national commerce, but it also treasured national innovation, for innovation is the daughter of markets: as Adam Smith described in the *Wealth of Nations* (1776, V. i.e. 26)

... the competition of the producers who, in order to undersell one another, have recourse to new divisions of labour, and new improvements of art, which might never otherwise have been thought of ...

So on 7 May 1625, in his eulogy at the funeral of King James I, the Right Reverend Dr John Williams (who was concurrently the Dean of Westminster, the Bishop of Lincoln and the Lord Keeper of the Great Seal, as well as being the future Archbishop of York), praised the late king for the "manufactures at home daily invented" during his reign (Nicholls, 1999, p. 41). Seventeenth-century England was a commercial and therefore innovative country.

Which is why patents for invention were often taken out by members of the elite. As we saw above, Pastorino (2017) has chronicled how, between 1607 to 1617, Parliament awarded 40 patents for invention, and amongst the patentees of invention were Lord Philip Herbert, Lord Edmund Sheffield, Lord Edward Somerset, Sir John Bouchier, Sir Thomas Howard, Sir Robert Mansell, Sir David Murray, and Sir Edward Zouch.

So the social elite in England, being commercially entrepreneurial, was also entrepreneurial in its research.



11 | DISCUSSION AND CONCLUSION

The fundamental insights of North and Weingast's 1989 article, namely that successful markets are cooperative games, that cooperative games are rule-bound, and that institutions embody those rules, are unassailable. However, many of the contingent arguments that North and Weingast proffered in support of their claim that the Glorious Revolution and the Bill of Rights were seminal events in the creation of the English, later British, Industrial Revolution are challengeable.

So the English economy started to stir c.1500, while technological and scientific innovation quickened at the turn of the seventeenth century, which coincided with the increase in energy consumption per capita and with the improvement of rivers in England and Wales. Since the debate on monopolies in the House of Commons coincided with those latter events, this article argues that that debate helped – by yielding *Darcy v. Allen* in 1602/03 – turn the English economy from an uncompetitive one into a competitive one well before 1688.

In their 2009 book *Violence and Social Orders*, North, Wallis and Weingast ask how societies shift from 'limited access' (where the ruling coalition limits entry to markets) to 'open access' (where economic competition is sustained). One answer was provided by the debate on monopolies of November 1601 in the House of Commons. Here we can follow the members of the ruling coalition as, in real time, they recognised that their personal interests were best served by making the shift from limited to open access (a recognition that caused a 'great silence' to fall as the MPs collectively accommodated that thought).¹⁰

If, however, following North, we identify the Glorious Revolution as the pivotal step towards the development of the English, later British, Industrial Revolution, then we lose that insight into the thinking of the ruling coalition, for the Glorious Revolution is in consequence cast as a *deus ex machina* by which, with one bound and thanks to an exogenous cause, namely an invited invasion, the English economy is freed. Such an approach thus obscures the solution to the economic problem that the English Parliament had achieved endogenously.

It might therefore be more insightful to recognise the strength of five claims for which this article has argued. First, the Statute of Monopolies in 1624 and the Petition of Right in 1628 were the conclusive endogenous steps the House of Commons took in its centuries-long campaign to liberate the Crown's subjects and their markets from monarchical diktats. Second, the execution of Charles I in 1649 was the measure that finally stopped the monarchical abuses of patents. Third, the Bill of Rights was, effectively, only the consolidation of those earlier Parliamentary victories. Fourth, the Glorious Revolution was important only because it rendered that consolidation essentially irreversible. Fifth, the debate in the House of Commons of 20 November 1601 laid the groundwork not only for the passages of the Statute of Monopolies and Petition of Right, but also for revealing the psychological mechanisms by which the ruling coalition shifted market access from limited to open.

On 20 November 1601 England's MPs resolved the prisoner's dilemma of Elizabeth's sales of patents of monopoly by shifting the English economy from a non-cooperative to a cooperative game, and so from non-competition to competition – and all without the help of that Dutch *stadtholder* and his wife.

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NOTES

- ¹ 'Britain' formally came into existence in 1707 with the union of England and Scotland.
- ² Bogart (2011) suggests that investment in rivers (and roads) accelerated after 1695, but he also recognises the growth after 1600.
- ³ Warde's findings are similar to the ones reported by Wrigley (2010).
- ⁴ Monopolies were sold as 'letters patent', which meant 'public letters' because the word 'patent' meant 'transparent' as in the expression 'patently obvious', from the Latin *patere*, meaning 'to open'. Honours, too, were sold as letters patent; for example, James I's tariffs (ruled 1603–1625) were £20,000 for an earldom, £15,000 for a viscountcy, £10,000 for a barony, and £1,095 for a baronetcy (Neal, 1837, p. 458).
- ⁵ We know the details of *Darcy v. Allen* primarily from Sir Edward Coke's report of the case, and as he had represented the plaintiff, he would have known the details. Corr   (1996) and Fisher (2011) speculate that Coke's report, which reflected his own pro-common law and anti-monarchical stances, was biased by those stances. But as Letwin (1954) had earlier argued, the judgement of the King's Bench in *Darcy v. Allen* only reaffirmed the long-established alignment of the judiciary of the common law against patents of monopoly issued by the Crown, so there seems no need to invoke bias in Coke's report.
- ⁶ North was later to resile from the argument that patents for innovation and invention stimulate economic growth. Thus in 1981 (p. 164) he reiterated the opinion he and Thomas had first given in 1970 ('The failure to develop systematic property rights in innovation until fairly modern times was a major source of the slow pace of technological change'), which was an argument he was to further reiterate in his 1989 paper with Weingast. But only a year later in 1990 North (pp. 47–8) was more tentative about the empirical importance of intellectual property rights: "... patent laws and trade secret laws are designed to raise the costs of those kinds of exchange deemed to inhibit innovation." And in his paper, 'Institutions', published a year later, and which provides his overview of the major developments that underlay the Industrial Revolution, North (1991) made no reference to the institutions of intellectual property rights. Nor did any such reference appear in his 1993 Nobel Prize lecture. North, indeed, seems to have changed his mind about the economic value of patents for innovation, and in that change he seems to have anticipated the current debate over their economic value (Bessen & Meurer, 2008; Boldrin & Levine, 2008; Haber & Lamoreaux, 2021; Kinsella, 2008; Moser 2013). Nonetheless, it is still generally believed that North showed not only that the Glorious Revolution inaugurated modern patent laws, but that those patents for innovation and invention were also an essential basis of that revolution: see, for example, Aghion et al. (2021, pp. 36–7).
- ⁷ Sir Francis Bacon owned shares in the Cwmystwyth mines, whose other shareholders included Sir Gelly Meyrick, Sir John Morley, Sir Richard Lewknor, Sir Richard Callender, Sir Anthony Ashley and Sir James Fullerton (Hughes, 1981).
- ⁸ The father of three significant children, namely Mary Herbert, who convened the literary and scientific Wilton Circle; the iron working and iron-investing Earl of Leicester; and Sir Philip Sidney, the poet.
- ⁹ Another mayoral example of the temporal elites embracing the commercial elites was the grant of a coat of arms to the father of William Shakespeare, John, following his assumption of the office of High Bailiff (mayor) at Stratford upon Avon.
- ¹⁰ It would be reasonable to view the House of Commons as indeed representing a coalition because Russell (1979, p. 5), writing of the 1620s (but the observation is not limited to that decade), noted that: "... the division [i.e. voting] was not the central institution of parliament. Divisions were disliked, and the putting of the question was many times postponed until the emergence of consensus enabled resolutions to be carried without a division."

REFERENCES

- Aghion, P., Antonin, C., & Bunel, S. (2021). *The Power of Creative Destruction: Economic Upheaval and the Wealth of Nations*. The Belknap Press.
- Allen, R. (2009). *The British Industrial Revolution in Global Perspective*. Cambridge University Press.



- Apostolides, A., Broadberry, S., Campbell, B., Overton, M., & van Leeuwen, B. (2008). *English Agricultural Output and Labour Productivity, 1250–1850: Some Preliminary Estimates*. <http://www.basvanleeuwen.net/bestanden/agriclongrun1250to1850.pdf> (accessed 3 November 2022).
- Bessen, J., & Meurer, M. (2008). *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk*. Princeton University Press.
- Bogart, D. (2011). Did the Glorious Revolution contribute to the transport revolution? Evidence from investment in roads and rivers. *Economic History Review*, 64, 1073–1112. <https://doi.org/10.1111/j.1468-0289.2010.00580.x>
- Bogart, D. (2013). *The Transport Revolution in Industrializing Britain: A Survey*. Working Paper 121306. Department of Economics, University of California-Irvine.
- Boldrin, M., & Levine, D. (2008). *Against Intellectual Monopoly*. Cambridge University Press.
- Bolt, J., Inklaar, R., de Jong, H., van Zanden, J. (2018). *Rebasing Maddison: New Income Comparisons and the Shape of Long-Run Economic Development*. Maddison Project Working Paper No 10. University of Groningen.
- Bosker, E., Buringh, E., & van Zanden, J. (2012). The rise and decline of European parliaments, 1188–1789. *Economic History Review*, 65, 835–861.
- Bouscasse, P., Nakamura, E., & Steinsson, J. (2021). *When Did Growth Begin? New Estimates of Productivity Growth in England from 1350 to 1870*. NBER Working Paper 28623. National Bureau of Economic Research.
- Broadberry, S. & Wallis, J. (2017). *Growing, Shrinking, and Long Run Economic Performance: Historical Perspectives on Economic Development*. Working Paper 23343. National Bureau of Economic Research.
- Broadberry, S., Campbell, B., Klein, A., Overton, M., & van Leeuwen, B. (2015). *British Economic Growth 1270–1870*. Cambridge University Press.
- Brown, A. (1890). *The Genesis of the United States*. Mifflin & Co.
- Carr, C. (1913). *Select Charters of Trading Companies A.D. 1530–1710*. Bernard Quaritch.
- Charleton, W. (1657). *The Immortality of the Human Soul, Demonstrated by the Light of Nature*. Henry Herringman.
- Clark, G. (1996). The political foundations of modern economic growth, 1540–1800. *Journal of Interdisciplinary History*, 26, 563–588. <https://doi.org/10.2307/205042>
- Clark, G. (2014). Markets and economic growth: The grain market of medieval England. *Cliometrica*, 9, 1–43. https://www.researchgate.net/publication/228747088_Markets_and_economic_growth_The_grain_market_of_medieval_England PMID: (accessed 8 September 2022).
- Cormack, L. (1997). *Charting an Empire: Geography at the English Universities 1580–1620*. University of Chicago Press.
- Corré, J. (1996). The argument, decision and reports of *Darcy v. Allen*. *Emory Law Journal*, 45, 1261–1327.
- Cox, G. (2012). Was the Glorious Revolution a constitutional watershed? *Journal of Economic History*, 72, 567–600. <https://doi.org/10.1017/S0022050712000307>
- Craik, H. (Ed.) (1916). *English Prose, Vol. I. Fourteenth to Sixteenth Century. Extracts from the Governance of England by Sir John Fortescue (c. 1394–1476)*. Macmillan. <https://bartleby.com/209/24.html> (accessed 8 September 2022).
- Davies, S. (1932). Further light on *The Case of Monopolies*. *Law Quarterly Review*, 48, 394–414.
- Davison, P. (1973). King James's Book of Bounty: From manuscript to print. *The Library*, s5-28, 26–53. <https://doi.org/10.1093/library/s5-XXVIII.1.26>
- de Roover, R. (1951). Monopoly theory prior to Adam Smith: A revision. *Quarterly Journal of Economics*, 65, 492–524. <https://doi.org/10.2307/1882577>
- Deane, P. (1979). *The First Industrial Revolution* (2nd ed.). Cambridge University Press.
- Dent, C. (2009). 'Generally inconvenient': The 1624 Statute of Monopolies as political compromise. *Melbourne University Law Review*, 33, 415–453.
- d'Ewes, S. (1662). *The Journals of All the Parliaments During the Reign of Queen Elizabeth, Both of the House of Lords and House of Commons*. John Starkey. <https://play.google.com/books/reader?id=vA1DAAAACAAJ&pg=GBS.PP1&hl=en> (accessed 8 September 2022).
- Erickson, C. (1983). *The First Elizabeth*. St Martin's Press.
- Federico, P. (1929). Origin and early history of patents. *Journal of The Patents Office Society*, 11, 292–305.
- Fisher, M. (2011). *Darcy v. Allen*. In C. Heath & A. Sanders (Eds.), *Landmark Intellectual Property Cases and Their Legacy* (pp. 63–82). Kluwer Law International.



- Fouquet, R., & Broadberry, S. (2015). Seven centuries of European economic growth and decline. *Journal of Economic Perspectives*, 29, 227–244. <https://doi.org/10.1257/jep.29.4.227>
- Gilbert, W. (1600). *De Magnete, Magneticisque Corporibus, et de Magno Magnete Tellure*. Peter Short.
- Guizot, F. (1856). *History of The English Revolution of 1640, from the Accession of Charles I to his Death* (trans. W. Hazlitt). H. G. Bohn.
- Haber, S., & Lamoreaux, N. (Eds.) (2021). *The Battle over Patents: History and Politics of Innovation*. Oxford University Press.
- Hammersley, G. (1973). The charcoal iron industry and its fuel, 1540–1750. *The Economic History Review*, 26, 593–613.
- Harkness, D. (2007). *The Jewel House: Elizabethan London and the Scientific Revolution*. Yale University Press.
- Harvey, W. (1628). *Exercitation Anatomica de Motu Cordis et Sanguinis in Animalibus*. William Fitzer.
- Hills, R. (1994). *Power from Wind: A History of Windmill Technology*. Cambridge University Press.
- Holdsworth, W. (1945). *A History of English Law, Volume 4* (3rd ed.). Sweet and Maxwell.
- Hughes, S. (1981). *The Cwmystwyth Mines*. The Northern Mine Research Society.
- James I. (1610). *A Declaration of His Majesties Royall pleasure, in what sort He thinketh fit to enlarge, or reserve Himselfe in matter of Bountie*. Robert Barker. <http://ia600208.us.archive.org/35/items/declarationofhis00greauoft/declarationofhis00greauoft.pdf> (accessed 8 September 2022).
- Johnson, S. (1864). *Free Government in England and America*. Carlton.
- Kealey, T., & Ricketts, M. (2014). Modelling science as a contribution good. *Research Policy*, 43, 1014–1024. <https://doi.org/10.1016/j.respol.2014.01.009>
- Kealey, T., & Ricketts, M. (2021). The contribution good as the foundation of the Industrial Revolution. In E. Dekker & P. Kuchař (Eds.), *Governing Markets as Knowledge Commons* (pp. 19–57). Cambridge University Press. <https://doi.org/10.1017/9781108692915.003>
- King, P. (2005). The production and consumption of bar iron in early modern England and Wales. *Economic History Review*, 58, 1–33. <https://doi.org/10.1111/j.1468-0289.2005.00296.x>
- Kinsella, S. (2008). *Against Intellectual Property*. Ludwig von Mises Institute.
- Kohn, M. (2005). The impact of government on economic development and growth in pre-industrial Europe. Ch. 23 in M. Kohn, *Origins of Western Economic Success*. <https://cpb-us-e1.wpmucdn.com/sites.dartmouth.edu/dist/6/1163/files/2017/03/23-govt-and-economy.pdf> (accessed 8 September 2022).
- Kyle, C. (2007). ‘But a new button to an old coat’: The enactment of the Statute of Monopolies, 21 James I cap.3. *Journal of Legal History*, 19, 203–223. <https://doi.org/10.1080/01440361908539576>
- Letwin, W. (1954). The English common law concerning monopolies. *University of Chicago Law Review*, 21, 355–385. <https://doi.org/10.2307/1597844>
- Levy, H. (1909). *Monopoly and Competition: A Study in English Industrial Organisation*. Batoche Books (2001).
- Macfarlane, A. (1978). The origins of English individualism: Some surprises. *Theory and Society*, 6, 255–277. <https://doi.org/10.1007/BF01681752>
- McCloskey, D. (2006). *The Bourgeois Virtues: Ethics for an Age of Commerce*. University of Chicago Press.
- McCloskey, D. (2010). *Bourgeois Dignity: Why Economics Can't Explain the Modern World*. University of Chicago Press.
- McCloskey, D. (2016). *Bourgeois Equality: How Ideas, Not Capital or Institutions, Enriched the World*. University of Chicago Press.
- Magna Carta. (1215). The British Library. <https://www.bl.uk/collection-items/magna-carta-1215> (accessed 13 September 2022).
- Messina, S., & Abe, T. (2022). Noblemen in business in the nineteenth century: The survival of an economic elite? *Business History*, 64, 207–225. <https://doi.org/10.1080/00076791.2021.1972974>
- Moser, P. (2013). Patents and innovation: Evidence from economic history. *Journal of Economic Perspectives*, 27, 23–44. <https://doi.org/10.1257/jep.27.1.23>
- Nachbar, T. (2005). Monopoly, mercantilism, and the politics of regulation. *Virginia Law Review*, 91, 1314–1379.
- Neal, D. (1837). *The History of the Puritans; Or, Protestant Nonconformists*. Tegg & Son.
- Nicholls, A. (1999). *The Jacobean Union: A Reconsideration of British Civil Policies Under the Early Stuarts*. Greenwood Press.
- Norman, R. (1581). *The Neue Attractive, Shewing the Nature, Propertie, and Manifold Vertues of the Loadstone: With the Declination of the Needle, Touched Therewith, Under the Plaine of the Horizon*. Reprinted (1720).
- North, D. (1981). *Structure and Change in Economic History*. Norton.
- North, D. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.



- North, D. (1991). Institutions. *Journal of Economic Perspectives*, 5, 97–112. <https://doi.org/10.1257/jep.5.1.97>
- North, D. (1993). Economic Performance through Time. Nobel Prize Lecture. <https://www.nobelprize.org/prizes/economic-sciences/1993/north/lecture/> (accessed 8 September 2022).
- North, D., & Thomas, R. (1970). An economic theory of the growth of the Western world. *Economic History Review*, 23, 1–17. <https://doi.org/10.2307/2594560>
- North, D., & Weingast, B. (1989). Constitutions and commitment: The evolution of institutions governing public choice in seventeenth-century England. *Journal of Economic History*, 49, 803–832. <https://doi.org/10.1017/S0022050700009451>
- North, D., Wallis, J., & Weingast, B. (2009). *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. Cambridge University Press.
- Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.
- Pastorino, C. (2009). The mine and the furnace: Francis Bacon, Thomas Russell, and early Stuart mining culture. *Early Science and Medicine*, 14, 630–660. <https://doi.org/10.1163/138374209X12465448337583>
- Pastorino, C. (2017). The philosopher and the craftsman: Francis Bacon's notion of experiment and its debt to early Stuart inventors. *Isis*, 108, 749–768. <https://doi.org/10.1086/695538>
- Price, W. (1906). *The English Patents of Monopoly*. Houghton, Mifflin & Co.
- Royal Proclamation. (1612). *The Effect of certaine Letter Patents granted to Joseph Usher*. Reproduced in Pastorino (2017, p. 764).
- Russell, C. (1979). *Parliament and English Politics: 1621–1629*. Oxford University Press.
- Satchell, M. (2017). *Navigable Waterways and the Economy of England and Wales: 1600–1835*. Cambridge Group for the History of Population and Social Structure.
- Smith, A. (1776). *An Inquiry into the Nature and the Causes of the Wealth of Nations*. Strahan.
- Smith, D. (1921). New information respecting Robert Recorde. *American Mathematical Monthly*, 28, 296–300. <https://doi.org/10.1080/00029890.1921.11986053>
- Smith, T. (1581). *A Discourse of the Common Weal of this Realm of England*. Cambridge University Press (1971).
- Sussman, N. (2022). Financial developments in London in the seventeenth century: The Financial Revolution revisited. *Journal of Economic History*, 82, 480–515. <https://doi.org/10.1017/S0022050722000134>
- Toynbee, A. (1884). *Lectures on the Industrial Revolution in England*. Rivington.
- Tyacke, N. (2007). Introduction: Locating the ‘English Revolution’. In N. Tyacke (Ed.), *The English Revolution c.1590–1720: Politics, Religion and Communities* (pp. 1–26). Manchester University Press.
- Vives, J. (1969). *An Economic History of Spain*. Princeton University Press.
- Warde, P. (2007). *Energy Consumption in England & Wales 1560–2000*. Consiglio Nazionale delle Ricerche.
- Webster, C. (1967). The College of Physicians: ‘Solomon’s House’ in Commonwealth England. *Bulletin of the History of Medicine*, 41, 393–412.
- Willan, T. (1964). *River Navigation in England 1600–1750*. Frank Cass.
- Wrigley, E. (2010). *Energy and the English Industrial Revolution*. Cambridge University Press.
- Zilsel, E. (1941). The origins of William Gilbert’s scientific method. *Journal of the History of Ideas*, 2, 1–32. <https://doi.org/10.2307/2707279>

CASE CITED

Darcy v. Allen. (1602/3). *Darcy Esquire v Thomas Allin of London Haberdasher* (1602) 74 ER 1131.

LEGISLATION CITED

Statute of Monopolies. (1624) (21 Jac 1 c 3). <https://www.legislation.gov.uk/aep/Ja1/21/3/contents> (accessed 7 September 2022).

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