



# Patenting, intellectual property rights and sectoral outputs in Industrial Revolution Britain, 1780–1851

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## Abstract

Patenting rose sharply during the British Industrial Revolution. Utilizing time series methods, we investigate the causal relationships between 16 industries and patented inventions. The results show that increased patenting was essentially a consequence of fast growth in the cotton, iron, and mining sectors, which increased the value of protecting intellectual property. Conversely, protecting intellectual property was not a cause of the Industrial Revolution.

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By accident, then, the imperfect nature of the patent system was in all probability the most appropriate for the economy as a whole for the long period of the industrial revolution. [Dutton \(1984, p. 205\)](#).

Evidence placed before the 1851 Select Committee ....certainly throws doubt on a strong causal connection between our early patent system and the British industrial revolution. [Boehm and Silbertson \(1967, p. 26\)](#).

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## 1. Introduction

Patenting has a long history. Machlup and Penrose (1950) note that a rather well developed patent system existed in Venice in the 15th century, and that the practice of granting monopoly privileges to inventors by the Crown or by city states was followed in many parts of Europe in the 16th and 17th centuries. In England the granting of patents under royal prerogative led to the Statute of Monopolies of 1624. Others followed with France and the USA enacting patent laws in 1791 and 1793, respectively.

Historians' judgements of the precocious English patent system's consequences are mixed. Some, including Fox (1947) associate the patent system in England with the Industrial Revolution. MacLeod (1988, p. 198) takes a more cautious approach, noting that the concept of "intellectual property" for technical invention was a late development, first mentioned in a pamphlet of 1712. After that the term re-appears sporadically in patent applications, before being enshrined in the Act extending James Watt's patent in 1775, "his property in the said application secured".

Ironically, Dutton (1988, 2004) argues that the imperfect British patent system may have approached the ideal. Inventors paid heavily, and separately in England, Scotland, and Ireland, for the temporary (14 years in the first instance), and uncertain privileges since intellectual property "rights" depended on court decisions. British patents offered some protection to inventors, but did not provide complete barriers to access and use by others. This, argues Dutton, was most appropriate for the economy as a whole during the Industrial Revolution. The balance eventually swung in favor of patentees. Sullivan (1989, p.436) attributes increased patent activity after 1830 to patentees favorable treatment in the courts. Yet the system before the reforms of 1852 remained cumbersome and administratively expensive.

Whether the property rights afforded to inventors during the Industrial Revolution levered technological and industrial progress is, on the basis of the historiography, unclear. The reverse interpretation, that the growth of patenting after 1760 followed industrial development, does appear in the literature. Ashton (1948) postulates that the timing and the direction of Industrial Revolution patenting activity was influenced by economic conditions, including prices, costs, and interest rates. Our chief purpose lies in putting the debates surrounding the protection of inventors' property and the Industrial Revolution on a firmer statistical footing, by articulating the direction of the causal linkages between patents and sector industrial growth in Britain, 1780–1851.

Historians are divided on the sectoral-pervasiveness of Industrial Revolution technological progress. O'Brien (1993), Harley (1993), and Crafts (1985) argue that technological progress was localized in the cotton and iron industries. Alternatively, Temin (1997), and Landes (1969) see the Industrial Revolution as broadly based. McCloskey (1988) adopted an intermediate position, claiming that around 46% of economy-wide productivity growth arose outside the "modernized sectors". The linkages between patents, as a measure of "protected" inventive activity, and the disaggregate record of British industrial growth between 1780–1851, have the potential to inform the debates surrounding historians' conceptualizations of the Industrial Revolution. The extent, if any, to which the effects of patented inventions spilled through the industrial economy will show how protecting inventors' property rights impinged on the economy-wide adoption of new technology. Conversely, the statistical causality tests will also show if patenting activity was stimulated by particular industrial sectors.

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