Online Appendix for

Freedom of Speech, Spirit of Innovation, and Long-term Economic Development: Evidence from the Qing Dynasty of China

Benlai Wang[1], Xuebo Wang[2]

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[1] School of Economics, Shanghai University of Finance and Economics.
[2] School of Economics, Shanghai University of Finance and Economics. E-mail: wang.xuebo@mail.shufe.edu.cn.

A1. Historical Background

A1.1 The Literary Inquisition in Qing China

This section provides an extensive introduction of the historical background of the literary inquisition during the Kangxi to Qianlong reigns (1661–1796).

The Ming Dynasty collapsed in 1644, and the Manchus invaded Beijing thereafter and established the Qing Dynasty. The Ming-Qing transition was marked by significant unrest, including widespread massacres and heightened tensions between the Manchu conquerors and the Han population (Wakeman, 1985, Xue, 2021). Such tensions persisted for a long time and became eased only after Emperor Kangxi began to govern the country in 1667.

The investigation of the case of History of the Ming Dynasty in 1661 signified that the tension between the Qing rulers and the anti-Qing Han population reached a peak. In this year, Emperor Shunzhi died, and his son Kangxi inherited the throne at the age of 8. At that time, Kangxi was still too young to govern the country, and four ministers assisted (or substituted) him to make decisions. Tinglong Zhuang, a Han intellectual organized people to compile a book on the history of the Ming Dynasty and published it in 1660. This publication was reported to the central government in 1661 as offensive to the Qing regime. The four ministers in charge of the government perceived this as a serious case and conducted a thorough investigation. The book was interpreted as cherishing and praising the Ming Dynasty and showing immense disrespect toward the Qing regime. As a result, in 1663, more than 70 people associated with the book were executed, and over a thousand were punished (Yan, 2016).

This case was sensational at the time and further intensified the tensions between the Qing rulers and Han intellectuals. It also reflected the Manchus' insecurity of the legitimacy of their regime. While some intellectuals view this as the first literary inquisition case in the Qing Dynasty, it did not signify the onset of tightened expression controls. In fact, no additional cases were investigated in the following 50 years. When Emperor Kangxi fully assumed power in 1667 at 14, he adopted completely different policies toward the Han population, generally allowing free expression.

Historians generally view the case of History of the Ming Dynasty not as the beginning of the literary inquisition in the Qing Dynasty but as part of the broader Qing campaign against anti-Qing activities (Yang, 1999). Compiling a book on the history of the Ming Dynasty during the delicate period of the Ming–Qing transition could easily be interpreted by the Qing rulers as not supporting the new regime. The book even labeled the Manchu armies as robbers and the Qing rulers as foreign enemies (Yu, 1996), adding to its controversial nature. In fact, many people involved in the case had previously engaged in activities of rebelling the Qing and rebuilding the Ming Dynasty. Thus, they deserved the punishments to some extent. Hence, some historians posit that the case was an early Qing effort to suppress potential Han opponents, rather than a literary inquisition per se (Yu, 1996).

Moreover, this incident occurred during a particular period when the four ministers were in power and made the decision. Emperor Kangxi's subsequent reign ended such harsh practices, including the campaign against anti-Qing forces. He implemented conciliation policies aimed at winning the support of the Han population by treating them well and was notably tolerant of intellectuals' free expression (Guo and Lin, 1990; Yang, 1992). Such enlightened policies were successful and are credited with initiating the prosperous "Kangxi–Qianlong Great Ages" (Yan, 2016).

Therefore, the case of History of the Ming Dynasty appears more as an isolated incident rather than the start of a systematic literary inquisition. Its societal impact, if any, was relatively short-lived. Notably, this case is absent in authoritative historical records of the Qing literary inquisition, such as *Qingdai wenziyu dang ji* (Qing Literary Inquisition Archives) (Zhang, 1934) and its updated edition (Wanyan, 2011). In both books, the first recorded literary inquisition case was the case of Mingshi Dai. Thus, these records suggest that the Qing rulers' systematic use of the literary inquisition as a tool to consolidate the authoritarian regime began with the investigation of the Mingshi Dai case in 1711.

When Emperor Kangxi took over the power in 1667, the country was devastated by wars, the economy was in a slump, and people lived in destitution. Many of the Han Chinese, which accounted for 95% of the total population then, were still resistant to the Manchu rulers, posing another potential threat to the Qing regime. To promote the economy and consolidate the regime, Emperor Kangxi adopted the conciliation policy toward the Han population to win their support. In particular, he conducted special examinations *(bo xue hong ru*) to select the Han elites to work for the government. The selected Han intellectuals were generally assigned to important positions. Emperor Kangxi visited famous Han intellectuals to persuade them to serve the Qing regime. Even though several refused to meet him, Emperor Kangxi was not angered and still informed them that they were welcome whenever they were willing to work for the government. His attitude towards the Han, particularly the intellectuals, was appreciated by the Han population and won their support for the Qing regime.

Emperor Kangxi was also tolerant of intellectuals' free expression. In an examination selecting the Han elites, one examinee expressed the idea that Manchus were barbarians, which clearly violated taboos of the Qing regime. However, Emperor Kangxi thought that the statement was not a big deal and let it pass (Yan, 2016). He also introduced a rule that previously published books containing words that violated the taboos of the Qing regime should not be banned and could be republished in their original versions (Yan, 2016). Emperor Kangxi also organized intellectuals to compile a book on the history of the Ming Dynasty, which officially announced that writing books on the Ming Dynasty became legal and virtually overturned the conviction of the previous case of History of the Ming

Dynasty. In 1707, an intellectual named Fuxiang Zhang wrote a poem to satirize Emperor Kangxi's extravagant inspection tour to the Chiangnan, where local officials tried their best to please the emperor by spending huge amounts of money to build palaces. Such expressions showed great disrespect to Emperor Kangxi but he did not investigate the case (Yan, 2016).

Emperor Kangxi's conciliation policy significantly eased the tension between the Qing rulers and the Han population and won the support of the majority of the Han Chinese. Moreover, his tolerance for free expression and other enlightened policies injected vitality into society and inspired people to contribute to society with initiatives (Guo and Lin, 1990). Historians argue that Emperor Kangxi's conciliation policies toward intellectuals were critical in stabilizing society and also boosting the economy, and such policies were the key factors that initiated the "Ages of Prosperity" or the "Kangxi–Qianlong Great Ages" in the Qing Dynasty (Yan, 2016).

As discussed in the main text, the turning point in Emperor Kangxi's policy toward free expression was the case of Mingshi Dai (or the case of *nan shan ji*), which was investigated in 1711.

Then a natural question emerges: Given that Kangxi was tolerant of citizens' free expression before 1711, why did he suddenly become sensitive to intellectuals' speech and initiate the literary inquisition in 1711? Some historians argue that the case of Mingshi Dai may only be an accident. For a long time, Emperor Kangxi's sons had been fighting fiercely for the right to inherit the throne, and the crown prince was deprived of the right of succession owing to his evil behavior for a second time in 1711. Emperor Kangxi was extremely angry and sad then, and the scandals about internal struggles within the royal court appealed to the public, possibly further causing political instability. Historians speculate that Kangxi intended to make a sensational case of the literary inquisition to divert the public's attention from the scandals of the royal court (Guo and Lin, 1990).

Furthermore, China had reached its zenith of prosperity up to 1711, and there were no external and internal threats to the Qing regime at the time. As founder of this great age of prosperity, Kangxi was also at the peak of his power and authority, and he did not have to treat intellectuals well to win their support anymore and could do whatever he wanted. Therefore, it is not surprising that Emperor Kangxi decided to punish Dai severely when he was infuriated by the latter's offensive speech, considering that the emperor was in a bad mood at the time.

A1.2 The Literary Inquisition and Scientific and Technological Innovation in Qing China

We hypothesize that the literary inquisition may have had a significant negative impact on scientific and technological innovation, contributing to China's sharp decline in S&T. However, Figures 1–3 in the main text show that the number of innovations in China slightly increased after 1750, despite the rise in literary inquisition cases during that period. This observation seems to contradict our hypothesis that the literary inquisition significantly reduced innovations. Nonetheless, the broader trend indicates that the level of innovation fluctuated around a relatively low level after 1750. Furthermore, within this broader trend, innovation continued to decline after 1770, when most literary inquisition cases were investigated. Therefore, Figures 1–3 are highly consistent with our hypothesis.

A1.3 Literary Inquisition and Censorship

Although literary inquisition appears similar to censorship, the two concepts are different in many ways. Censorship is defined as "the practice of officially examining books, films, etc. and suppressing the unacceptable parts" (Pearsall et al., 2007). This practice is common in authoritarian regimes and aims to prevent the spread of regime-threatening information among citizens. By keeping citizens in ignorance, censorship is considered as the key to the popular support and stability of authoritarian regimes (Ford, 1935; Chen and Yang, 2019). By contrast, instead of pre-examining books or other forms of expression and eliminating unfavorable parts in advance, the literary inquisition re-examines published books and punishes authors severely if their expressions were interpreted as offensive to the regime. Such a policy aims to deter potential opposition by sending strong messages to citizens that people who dare to oppose to the regime would face severe punishment. In brief, censorship makes citizens supportive of the regime by keeping them in ignorance via information control, while the literary inquisition forces citizens to be obedient to the regime by threatening to kill them otherwise.

Both the literary inquisition and censorship are instruments of thought control on citizens for rulers to consolidate the authoritarian regimes. Nevertheless, the literary inquisition is more unreasonable, making citizens feel insecure and dare not to express their ideas or engage in any potentially risky activities. Such extreme controls on expression created a terrifying atmosphere among citizens in the Qing Dynasty and had profound effects on society.

A1.4 The Qing Literary Inquisition and the European Counter-Reformation

People may naturally compare the Qing China's literary inquisition with the European Counter-Reformation and regard them as similar thought control policies. However, they diverged significantly in several aspects and had distinct impacts on China and Europe. While the literary inquisition may have led to China's steep decline in S&T and further its ultimate decline in economy, the Counter-Reformation exerted a relatively limited effect on European S&T and economic development. This section delves into these differences in detail.

The European Counter-Reformation, primarily a response by the Catholic Church to the Protestant Reformation during the 16th and 17th centuries, commenced with the Council of Trent (1545–1563) and largely ended with the conclusion of the European wars of religion in 1648 (Cabello, 2023). The Roman Inquisition, established in 1542, primarily targeted Protestantism, which was defined as heresy in Catholic territories (Dewitte et al., 2023). Operating through local tribunals led by professional inquisitors, the Inquisition enforced adherence to Catholic doctrine by punishing heresy deviating from it. Moreover, the Catholic Church also implemented book censorship to control the production and diffusion of books with heretic ideas (Dewitte et al., 2023).

Three key differences distinguish the Counter-Reformation from the literary inquisition:

1. Severity of Punishments: The punishments during the Counter-Reformation, including admonishments, imprisonment, property confiscation, forced labor, exile, public abjuration, shaming, and flogging (Dewitte et al., 2023), were generally much less severe than those of the literary inquisition. Capital punishment was rare, and accused individuals often had opportunities to defend themselves or could even be exempted from punishment upon renouncing heretical beliefs (Dewitte et al., 2023).
2. Uncertainty of Offenses: The Counter-Reformation, with its clear focus on Protestantism, offered citizens greater certainty regarding punishable offenses. Unlike the literary inquisition, which created a pervasive atmosphere of fear, the Counter-Reformation did not instill a similar level of terror.
3. Censorship Strategies: The Catholic Church's book censorship, involving publishing lists of forbidden books and inspecting customs and storehouses, mainly targeted bookmen with prohibited volumes, who faced fines and book burning. Authors were not typically punished (Becker et al., 2021). Given that the authors faced little risk of punishment, they could participate in scientific and technological pursuits freely. The flourishing of the Scientific Revolution during this period suggests a limited impact of the censorship on European S&T development.

Furthermore, the divergent state systems in Europe and China may have also contributed to the differing impacts of these policies. Specifically, given the polycentric state system in Europe, there were still many regions out of the reach of the Catholic Inquisition during the Counter-Reformation. Thus, individuals with creative yet heretical ideas could relocate to those regions where such ideas were tolerated and their talents highly rewarded. As shown in the literature, Europe's polycentric state system fostered intellectual pluralism and a competitive market for ideas, instrumental in the Scientific and Industrial Revolutions (Jones, 2003; Mokyr, 2017; Scheidel, 2019; Fernández-Villaverde et al., 2023). In contrast, China's politically unicentric system meant that the literary inquisition overshadowed the entire country, leaving no refuge for talents. For instance, in 1522, Niccolo Buccella, a physician and surgeon from Padua, fled to Romania and then Poland to avoid arrest by the Inquisition. He later became the King's doctor and surgeon, thriving in his new position (Dewitte et al., 2023).

Such options were unavailable in Qing China, amplifying the literary inquisition's destructive societal impact.

While the Counter-Reformation had significant adverse effects in regions like Italy and Spain, where the Catholic Church wielded substantial power and the Inquisition was implemented intensely (Becker et al., 2021; Blasutto and de la Croix, 2023; Drelichman et al., 2021, Dewitte et al., 2023; Cabello, 2023), its overall impact on Europe was relatively limited. In particular, the Scientific Revolution blossomed in Europe during the Counter-Reformation, and the Enlightenment ensued, eventually leading to the Industrial Revolution in the 1700s.

In conclusion, the Qing literary inquisition could have led to China's sharp decline in S&T and its ultimate decline in economy, whereas the European Counter-Reformation was a comparatively minor obstacle in the continent's ascent in S&T and economic progress.

A2 Data

A2.1 Data on Scientific and Technological Innovation

As detailed in the main text, our empirical analysis relies on data concerning scientific and technological innovation at the prefectural level during the period 1700–1800. This data is sourced from the book "History of Science and Technology in China: Chronological Volume " (Ai and Song, 2006), which chronicles significant events in the history of Chinese scientific and technological activities. We identify events that signify substantial advancements in science and technology (S&T) as innovations.

Figure A1: A Sample of the Records on Innovation in Ai and Song (2006)

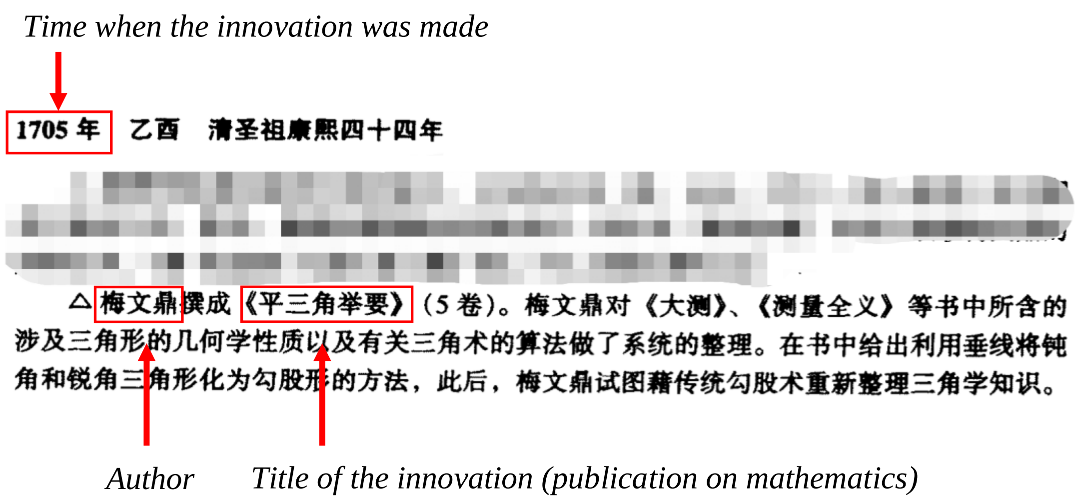


Figure A1 provides a sample of the records on scientific and technological events from which we extract relevant information on innovations. Each record includes essential details about the innovation, such as the time of the innovation (1705), the innovator (Wending Mei), the title of the innovation (*ping san jiao ju yao*, a publication on mathematics), and a comprehensive description of the innovation itself. However, the record does not specify the location where the innovation occurred. In practice, we determine the residence of the innovator at the time of the innovation by tracking their life, and we attribute this location as the site of the innovation.

Our analysis includes 102 notable innovations in the 1700–1800 period. Among these innovations, approximately 80% (or 82 innovations) are scholarly publications on science and technology, encompassing fields such as mathematics, physics, astronomy, medicine, and geography. The remainder primarily comprises technological breakthroughs, encompassing enhancements in cultivation techniques, novel disease treatments, advancements in water engineering, and innovative solutions for road and bridge construction. Collectively, these innovations represent significant strides in S&T in China during this period.

In Figures 1 and 2 of the main text, we compare scientific and technological innovations in China and Europe (Britain) in the 1670–1790 period. Given that the data on innovations in China and Europe are sourced from two different books, people may doubt whether they are comparable. We now provide more information on the data on innovations in China and Europe to confirm that the data are reliable to a large extent.

As shown in the main text, the data on scientific and technological innovations in China and Europe are from Ai and Song (2006) and Ito et al. (1984), both of which document important events of scientific and technological activities in Chinese and European history, respectively. We identify the events that reflect important advancements in S&T as innovations. Given that all important historical events that reflect significant advancements in S&T in China and Europe were recorded in the two books, our data on innovations in China and Europe in the 1670–1790 period largely reflect the S&T development trends in the two regions in this period.

Table A1 presents the compositions of scientific and technological innovations (by field) in China and Europe in the 1650–1790 period. We roughly divide these innovations into two categories: science and technology. Panel A shows that in Europe the shares of innovations in science and technology are 59% and 41%, respectively. In China the corresponding statistics are 75% and 25%, respectively. Panel A also presents these statistics for Europe and China before and after 1710. The shares of technological innovations increased in both regions after 1710. While this increase in the share of technological innovations in Europe may reflect the surge of technological development before and during the

Industrial Revolution, such an increase in China may be attributed to technological activities being less affected by the literary inquisition at the time.

Panels B and C further present the compositions of scientific and technological innovations by field in Europe and China, respectively. Specifically, we divide scientific innovations into the following categories based on the fields that they belong to: physics, biology, medicine, mathematics, chemistry, astronomy, geography, geology, and others. Similarly, we divide technological innovations into the following categories: mechanical engineering, chemical engineering, civil engineering, instrument manufacturing, ironmaking technology, materials engineering, military technology, agricultural technology, and others. Generally, most scientific innovations in Europe were on physics, biology, medicine, mathematics, and chemistry. By contrast, most scientific innovations in China were on medicine, mathematics, geography, and geology. When it comes to technological innovation, the dominant fields in Europe and China were mechanical engineering and agricultural technology, respectively.

Panels B and C of Table A1 also show that although scientific and technological innovations in China decreased sharply after the literary inquisition, innovations in some fields seem less affected by it. Specifically, the share of innovations in medicine within the scientific domain and the share of innovations in agricultural technology within the technological domain increased significantly after 1710, indicating that medical and agricultural activities may be less affected by the literary inquisition. Although the literary inquisition likely had a significant negative impact on innovation in most scientific and technological fields, not all fields were equivalently susceptible to its effects.

Table A2 presents some examples of typical scientific and technological innovations in various fields in Europe and China in the 1650–1790 period. The comprehensive lists of all innovations in Europe and China in this period are available upon request.

People may still doubt that our measure of innovation may not be perfect and the obtained indicators of scientific and technological innovation in Europe and China may not be comparable at the time. We acknowledge that there may not be perfect measure of scientific and technological innovation hundreds of years ago. However, as discussed in the main text, we do not require that the number of innovations in a certain period in China or Europe accurately reflects their absolute level of science and technology at the time. In particular, if our definition and measure of innovation are constant across regions and over time, then our data on innovations for a certain period can largely reflect the development trends of science and technology in China and Europe in the period. In particular, if the numbers of innovations are comparable across regions within China and over time, then it would not be a problem for our identification of the impact of the literary inquisition on innovation in the treatment prefectures.

Table A1: Compositions of S&T Innovations in Europe and China in 1650–1790 (By Field)

	1650–1790		1651–1710		1711–1790	
	Europe	China	Europe	China	Europe	China
	Panel A: Scientific and Technological Innovations					
Total Number	349	153	119	90	230	63
Composition						
Science	58.70%	74.50%	69.70%	78.90%	53.00%	68.20%
Technology	41.30%	25.50%	30.30%	21.10%	47.00%	31.80%
	Panel B: Scientific Innovations					
Total Number	205	114	83	71	122	43
Composition						
Physics	31.20%	4.40%	32.50%	2.80%	30.30%	7.00%
Biology	22.40%	7.90%	18.10%	8.50%	25.40%	7.00%
Medicine	13.20%	24.60%	14.50%	15.50%	12.30%	39.50%
Mathematics	12.20%	22.80%	21.70%	26.80%	5.70%	16.30%
Chemistry	10.70%	0.90%	6.00%	0.00%	13.90%	2.30%
Astronomy	2.40%	5.30%	2.40%	26.80%	2.50%	9.30%
Geography	2.40%	13.20%	1.20%	12.70%	3.30%	14.00%
Geology	2.40%	20.20%	2.40%	5.60%	2.50%	4.70%
Others	2.90%	0.90%	1.20%	1.40%	4.10%	0.00%
	Panel C: Technological Innovations					
Total Number	144	39	36	19	108	20
Composition						
Mechanical engineering	48.6%	2.6%	66.7%	5.3%	42.6%	0.0%
Chemical engineering	9.7%	0.0%	0.0%	0.0%	13.0%	0.0%
Civil engineering	9.7%	17.9%	13.9%	21.1%	8.3%	15.0%
Instrument manufacturing	6.9%	7.7%	2.8%	15.8%	8.3%	0.0%
Ironmaking technology	6.3%	2.6%	2.8%	5.3%	7.4%	0.0%
Materials engineering	5.6%	10.3%	11.1%	0.0%	3.7%	20.0%
Military technology	2.8%	2.6%	2.8%	5.3%	2.8%	0.0%
Agricultural technology	2.8%	48.7%	0.0%	36.8%	3.7%	60.0%
Others	7.6%	7.7%	0.0%	10.5%	10.2%	5.0%

Table A2: Examples of Scientific and Technological Innovations in Europe and China in 1650–1790 (By Field)

	China	Europe
	Panel A: Science	
Mathematics	In 1672, Mei Wending presented the general solutions for a diverse range of linear equations in his work "*Fangcheng lun (Theory of Equations)*".	In 1686, Gottfried Wilhelm Leibniz proposed an influential integration algorithm in his paper "*New Method for the Greatest and the Least*".
Physics	In 1695, Liu Xianting documented the phenomenon of magnetic shielding in his notable work titled "*Guangyang zaji* (*The Miscellaneous Records of Guangyang)*".	In 1660, Robert Boyle proposed Boyle's Law in his work "*New Experiments Physico-Mechanicall, Touching the Spring of the Air and Its Effects*".
Astronomy	In 1673, Wang Xihuan proposed a model of the universe in his work "*Wuxing xingdu jie (Explanation of the Movements of the Five Planets)*".	In 1655, Christiaan Huygens discovered Saturn's moons and rings.
Chemistry	In 1765, Zhao Xuemin recorded organic acids, bases, and ammonia in his book "*Bencao gangmu shiyi (Supplement to the Compendium of Materia Medica)*".	In 1661, Robert Boyle proposed that the aim of chemical research is to know the nature of objects in his influential work "*The Sceptical Chymist*".
Medical science	In 1665, Qi Kun published the book "*Waike dacheng (Compendium of Surgery)*", which extensively discusses surgical conditions and their respective treatments.	In 1664, Thomas Willis published "*Cerebri Anatome*", a pioneering work on the nervous system that coined the term "neurology".
Biology	In 1683, Chen Dingguo published the book "*Li pu (Lychee Chart)*", which extensively studies lychee varieties.	In 1682, John Ray published the book "*Methodus Plantarum Nova*", which classifies plants into monocotyledons, dicotyledons, and other categories.
Geography	In 1662, Gu Yanwu compiled the book "*Zhao yu zhi (National Geography General)*", which covers various subjects such as settlement, geography, and landmarks.	In 1686, Edmund Halley studied the cause of trade winds and monsoons.
Geology	In 1664, Sun Tingquan published the book "*Yanshan zaji (Miscellaneous Records of Yanshan)*", which documents how to use rock formation to identify ore deposits.	In 1669, Nicolaus Steno postulated that various rocks are formed through the process of sedimentation in his work "*Preliminary Discourse to a Dissertation on a Solid Body Naturally Contained within a Solid*".
Others	In 1666, Xiong Bolong presented a critical analysis of traditional religious superstitions in his work titled "*Wuhe ji*", proposing that nature consists of entities without a conscious will.	In 1666, Robert Boyle discussed the mechanical universe theory in his work "*Origin of Forms and Qualities according to the Corpuscular Philosophy* ".

(*Continues*)

Table A2—*Continued*

	Panel B: Technology	
Mechanical engineering	In 1660, craftsmen in Nanjing and Shanghai began to imitate the striking clock.	In 1663, Isaac Newton designed a four-wheeled vehicle that utilized the propulsion of steam recoil for forward motion.
Civil engineering	In 1689, Jin Fu completed the book "*Zhihe fanglue (Flood Control Strategies)*", in which he summarized his experiences in flood control.	In 1679, V.Viviani implemented a flood control scheme for the Arno River in Florence.
Agricultural technology	In 1658, Zhang Lvxiang published the book "*Bu nong shu (Supplement to the Agricultural Treatise)*", which documents the agricultural technologies used in the Taihu Lake area.	In 1731, Jethro Tull designed a seed drill that can sow three ridges at once.
Materials engineering	In 1739, Tang Ying's work "*Tao ren xin yu (Poetry of the Ceramic Artisan)*" comprehensively recorded the technologies employed in the production of porcelain in Jingdezhen.	In 1662, T. Tilman made a crystalline lead glass.
Ironmaking technology	In 1696, a new technology was introduced to improve the size and construction of the iron smelting furnace in an ironworks in Guangdong Province.	In 1665, Dard Dudley published the book "*Metallum Martis*", which studied the use of coal in iron making.
Instrument manufacturing	In 1662, Sun Yunqiu made more than 70 kinds of optical instrument, including telescopes and magnifiers.	In 1714, Daniel Gabriel Fahrenheit invented mercury thermometer.
Chemical engineering	None	In 1736, Joshua Ward made sulfuric acid with sulfur and saltpeter for commercial manufacture.
Military technology	In 1687, Dai Zi invented a weapon "c*hongtian pao*" (which is similar to the mortar) for the Qing government.	In 1676, the French army used long grenades when attacking Algeria.
Others	In 1718, Xu Zhiding invented the "porcelain type", a typeface made from clay glazed and calcined for typesetting and printing.	In 1783, the Montgolfier brothers carried out a hot air balloon experiment, in which the hot air balloon carried the animals to a height of 500 meters and landed safely.

A2.2 Data on Literary Inquisition Cases

As noted in the main text, our primary data source on the literary inquisition is *Qingdai wenziyu dang (zengding ben)* (Qing Literary Inquisition Archives (Updated Edition)) (Wanyan, 2011). The book is a revised edition of *Qingdai wenziyu dang ji* (Qing Literary Inquisition Archives) (Zhang, 1934), compiled by historians using resources from the Qing Imperial Archives in the 1930s.

Given that the Qing government implemented the literary inquisition and emperors made the final decisions on all the investigated cases, they should have been meticulously documented in official archives. Thus, *Qingdai wenziyu dang (zengding ben)* stands as the most authoritative records of the Qing literary inquisition. In recent studies on this subject, most scholars have relied on this book as their primary data source (e.g., Hu, 2013; Sun and Song, 2018).

Zhu (2013) highlights three major advantages of the *Qingdai wenziyu dang (zengding ben)* as a data source on the literary inquisition:

1. Reliability of Qing Official Archives: The book sources its information from Qing official archives, including the Grand Council (*junji chu*)'s archives, palace memorials, and *Qing Shilu*. These official archives represent the most reliable source of historical records on the Qing literary inquisition.
2. Detailed Documentation: It provides exhaustive details on each case of literary inquisition, including the cause and course of the investigation, the emperor's response, the verdict, and information on the accused.
3. High Value as Primary Historical Material: The records in the book comprehensively capture the full scope of the literary inquisition cases, thereby providing invaluable first-hand historical documentation.

Xue (2021) uses *Qingdai wenziyu an* (Qing Literary Inquisition Cases) (Zhang and Du, 1991) as her data source on the literary inquisition. This book was published 20 years earlier than *Qingdai wenziyu dang (zengding ben)*, and it includes 65 cases from the *Qingdai wenziyu dang ji* and additional 21 cases from other sources such as intellectuals' notes. Records from different sources may not be comparable. In particular, intellectuals' notes on the literary inquisition may be subjective to some extent and thus not comparable to those official records. These facts cast shadow on the credibility of the records from this book. Our data source has several advantages. First, our sample size is slightly larger than Xue's. The *Qingdai wenziyu dang (zengding ben)* documents ten cases not recorded in *Qingdai wenziyu an*, indicating its broader scope in historical documentation. Second, our data source is more frequently used in Chinese literature. According to the CNKI (China National Knowledge Infrastructure), since its publication in 2011, *Qingdai wenziyu dang (zengding ben)* has been cited 34 times, whereas *Qingdai wenziyu an* has only been cited three times.[3]

Reassuringly, the difference between the two data sources is relatively small, and our results are not sensitive to the choice of the data source on the literary inquisition. We conduct our empirical analysis using Xue's data on the literary inquisition and present the results in Panel A of Table A3.

[3] https://kns.cnki.net/kns8s/AdvSearch?classid=YSTT4HG0

Both the estimates for the full and matched samples remain similar to those baseline results presented in Tables 2 and 3 in the main text. Additionally, we merged the two data sources to include all cases documented in both books, resulting in a final sample of 96 cases. Panel B of Table A3 presents the obtained estimates with this merged sample, which are also similar to the baseline estimates in the main text. Thus, our results remain robust across various specifications using alternative datasets on the literary inquisition.

Table A3: The Effect of the Literary Inquisition on Innovation (with Alternative Data Sources on the Literary Inquisition)

	Dependent variable: # Innovations			
	Panel A: Using Xue's Data		Panel B: Using Combined Sample	
	Full Sample	Matched Sample	Full Sample	Matched Sample
	(1)	(2)	(3)	(4)
Literary Inquisition	–0.0356**	–0.0455**	–0.0345***	–0.0481**
	(0.0148)	(0.0189)	(0.0132)	(0.0191)
Baseline Controls	Yes	Yes	Yes	Yes
Y mean	0.0187	0.0288	0.0187	0.0288
Observations	4960	2220	4960	2220
R-squared	0.157	0.236	0.157	0.236

Notes: This table presents the robustness of our DID estimates of the effect of the literary inquisition on the number of innovations with alternative data sources on the literary inquisition. Specifically, we estimate Equation (1) in the main text, using the data of Xue (2021) and a combined sample derived from both Xue's dataset and our own source on the literary inquisition. The results are reported in Panels A and B, respectively. Baseline controls are the same as those in Column 4 of Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A2.3 Data on Land Tax Revenue

Due to a lack of annual land tax revenue data for all prefectures in the Qing Dynasty, we had to construct a balanced panel data set on land tax revenue in which time intervals between prefectural observations are constant for our empirical analysis. We now demonstrate how to construct such a balanced panel data set on the land tax revenue at the prefectural level in the 1680–1850 period.

We first collect the data on the land tax revenue at the prefectural level in different years from both provincial and national General Records (*tong zhi*) in the Qing Dynasty. The provincial General Records chronicle significant provincial events during certain periods, including land tax revenue of all of their subordinate prefectures. Likewise, the national General Records document land tax revenue for all prefectures across the country in certain years.

Table A4 presents all the General Records we employ to construct the panel data on prefectural land tax revenue in the Qing Dynasty. The provincial General Records provide prefectural land tax revenue for over 18 provinces in certain years in 1667–1739, while the national General Records provide similar information for all prefectures across the country in 1743, 1784, and 1820.

To construct a balanced panel data on land tax revenue at the prefectural level, we estimate annual land tax revenue for each prefecture using the average annual growth rate between two observations. For instance, we have data on land tax revenue of all prefectures in Jiangxi province in 1724 and 1743, from which we could calculate the average annual growth rate of the land tax revenue of these prefectures during this period. With an underlying assumption that the prefectural land tax revenue grew at a constant rate during this period, we predict the prefectures' annual land tax revenue in each year in 1724–1743. Evidently, such an exercise may not be completely accurate. However, our study aims to identify the long-term impacts of the literary inquisition on land tax revenue in affected regions, and thus such inaccurate estimation of the land tax revenue during a relatively short period may not be a problem.

Unfortunately, after 1820, the data on land tax revenue was available only at the provincial level. We therefore calculate the average annual growth rates of all provincial land tax revenue for a certain period. We then use these growth rates to approximate those of prefectures within each province. Such a practice carries an underlying assumption that the land tax revenue of all prefectures within the same province experienced the same growth rate in this period. For instance, we have the data on the land tax revenue of Zhejiang province in 1820 and 1841, and we can calculate the average annual growth rate of the land tax revenue in the province during this period. By assuming that land tax revenue of all prefectures in Zhejiang province grew at the same rate to that of the province, we can obtain the estimated annual land tax revenue of those prefectures in the 1820–1841 period.

We acknowledge that this is not a perfectly accurate practice. Particularly, the land tax revenue of treatment prefectures affected by the literary inquisition may experience a lower growth rate than that of control prefectures after 1820. However, this may not be a problem for our identification. Specifically, the literary inquisition could have a negative effect on the land tax revenue in treatment prefectures in the long term, and thus the average growth rates of land tax revenue of treatment prefectures could be lower than that of control prefectures of the same province. Therefore, if we assume that treatment and control prefectures experienced the same growth rate in land tax revenue after 1820, it would be more difficult for us to identify a negative effect of the literary inquisition on land tax revenue in treatment prefectures. Therefore, under this circumstance, the DID estimates would be a lower bound of the treatment effect of the literary inquisition on land tax revenue in treatment prefectures, and the obtained significantly negative estimates would present strong evidence of the treatment effects. Following the above practice, we finally obtain a decadal panel data set of land tax revenue at the prefectural level in the 1680–1850 period.

Table A4: Data Source of Land Tax Revenue

Region	Year Source	Author
Panel A: Provincial General Records		
Prefectures in Shannxi	1667 *Kangxi Shannxi Tongzhi*	Jia Hanfu et.al
Prefectures in Sichuan	1673 *Kangxi Sichuan Tongzhi*	Cai Yurong et.al
Prefectures in Shandong	1676 *Kangxi Shandong Tongzhi*	Zhao Xiangxing et.al
Prefectures in Zhejiang	1681 *Kangxi Zhejiang Tongzhi*	Zhao Shilin et.al
Prefectures in Shanxi	1682 *Kangxi Shanxi Tongzhi*	Ku Erkang et.al
Prefectures in Jiangxi	1682 *Kangxi Jiangxi Tongzhi*	Yu Chenglong et.al
Prefectures in Guangxi	1683 *Kangxi Guangxi Tongzhi*	Hao Yu et.al
Prefectures in Jiangsu and Anhiu	1683 *Kangxi Jiangnan Tongzhi*	Yu Chenglong et.al
Prefectures in Hubei and Hunan	1684 *Kangxi Huguang Tongzhi*	Xu Guoxiang et.al
Prefectures in Zhili	1685 *Yongzheng Jifu Tongzhi*	Li Wei et.al
Prefectures in Yunnan	1686 *Kangxi Yunnan Tongzhi*	Fan Chengxun et.al
Prefectures in Henan	1695 *Kangxi Henan Tongzhi*	Gu Qian et.al
Prefectures in Guizhou	1697 *Kangxi Guizhou Tongzhi*	Wei Jiqi et.al
Prefectures in Zhili	1724 *Yongzheng Jifu Tongzhi*	Li Wei et.al
Prefectures in Jiangxi	1724 *Yongzheng Jiangxi Tongzhi*	Xie Min et.al
Prefectures in Shannxi	1727 *Yongzheng Shannxi Tongzhi*	Liu Yuyi et.al
Prefectures in Sichuan	1728 *Yongzheng Sichuan Tongzhi*	Huang Tinggui
Prefectures in Henan	1728 *Yongzheng Henan Tongzhi*	Tian Wenjing et.al
Prefectures in Guangdong	1730 *Yongzheng Guangdong Tongzhi*	Hao Yulin et.al
Prefectures in Shanxi	1731 *Yongzheng Shanxi Tongzhi*	Jueluo Shilin et.al
Prefectures in Hubei and Hunan	1732 *Yongzheng Huguang Tongzhi*	Mai Zhu et.al
Prefectures in Yunnan	1732 *Qianlong Yunnan Tongzhi*	E Ertai et.al
Prefectures in Gaungxi	1733 *Yongzheng Guangxi Tongzhi*	Jin Gong et.al
Prefectures in Zhejiang	1733 *Yongzheng Zhejiang Tongzhi*	Li Wei et.al
Prefectures in Fujian	1734 *Qianlong Fujian Tongzhi*	Hao Yulin et.al
Prefectures in Shandong	1735 *Yongzheng Shandong Tongzhi*	Yue Jun et.al
Prefectures in Jiangsu and Anhui	1735 *Qianlong Jiangnan Tongzhi*	Zhao Hongen et.al
Prefectures in Gansu	1736 *Qianlong Gansu Tongzhi*	Xu Rong et.al
Prefectures in Guizhou	1739 *Qianlong Guizhou Tongzhi*	E Ertai et.al
Panel B: National General Records		
All prefectures	1743 *Kangxi Daqing Yitongzhi*	Xu Qianxue et.al
All prefectures	1784 *Qianlong Daqing Yitongzhi*	He Shen et.al
All prefectures	1820 *Jiaqing Chongxiu Yitongzhi*	Pan Xien et.al
Panel C: Land Tax Revenue at the Provincial Level		
All provinces	1841 *Shiqu Yuji*	Wang Qingyun
All provinces	1842 *Shiqu Yuji*	Wang Qingyun
All provinces	1845 *Shiqu Yuji*	Wang Qingyun
All provinces	1849 *Shiqu Yuji*	Wang Qingyun

Table 1 in the main text shows that the sample of prefectures in the land tax analysis is smaller than that in the innovation analysis. This discrepancy arises because the two analyses are based on different regional administrative divisions —1680 for land tax and 1820 for innovation. In 1680, Qing China had fewer prefectures, many of which were subsequently divided into smaller units as administrative boundaries changed over time. When studying innovation, we use the 1820 administrative division standard because it includes a larger sample of prefectures, leading to more accurate estimates. However, for the land tax analysis, the 1820 standard is not feasible, as earlier land tax data for the smaller prefectures, which were split and newly formed after 1680, is unavailable.

A3 Estimation Results for Alternative Definition of the Treatment Group

Table A5: The Effect of the Literary Inquisition on Innovation (Alternative Definition of the Treatment Group)

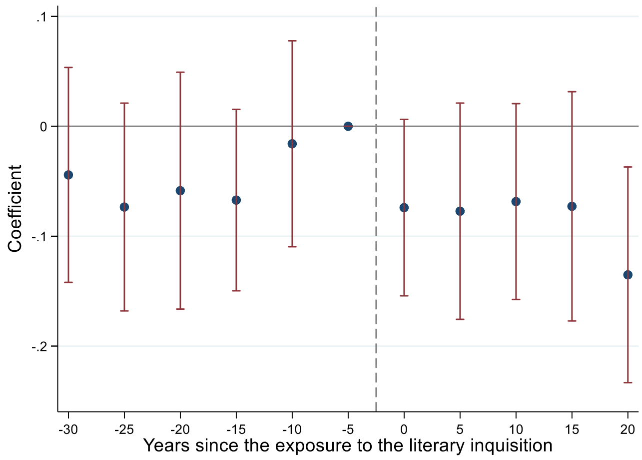
	Dependent Variable: # Innovations			
	(1)	(2)	(3)	(4)
Literary Inquisition	–0.0405***	–0.0367***	–0.0378***	–0.0391***
	(0.0145)	(0.0141)	(0.0141)	(0.0144)
Y mean	0.0187	0.0187	0.0187	0.0187
Observations	4960	4960	4960	4960
R-squared	0.103	0.128	0.133	0.158
Prefecture FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE × Time FE	Yes	Yes	Yes	Yes
Treat × After1790	Yes	Yes	Yes	Yes
Jinshi ×Time FE	No	Yes	Yes	Yes
Pop density1630 ×Time FE	No	Yes	Yes	Yes
Rice ×Time FE	No	No	Yes	Yes
Foxtail millet ×Time FE	No	No	Yes	Yes
Sweet potato ×Time FE	No	No	Yes	Yes
Language polarization ×Time FE	No	No	No	Yes
Language fragmentation ×Time FE	No	No	No	Yes
Coastal ×Time FE	No	No	No	Yes
Main river ×Time FE	No	No	No	Yes

Notes: This table examines the effect of the literary inquisition on the number of innovations in treatment prefectures with the alternative definition of the treatment group. Specifically, it presents estimates of the coefficient β from Equation (1) in the main text. The control variables are identical to those presented in Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In our benchmark analysis, we define the treatment as a prefecture's first exposure to the literary inquisition case: when the hometown of the culprits of the literary inquisition cases was identified as a prefecture for the first time. However, as discussed in the main text, this definition may not be perfect, as the effects of the literary inquisition could extend beyond the culprits' hometown prefectures. For instance, the culprits' residential prefectures and the prefectures where executions occurred may also be affected.

To address this, we have included these additional regions in the treatment group for an alternative analysis. Figure A2 and Table A5 present the event-study and DID estimation results, respectively. These results are consistent with the benchmark results presented in the main text. In summary, our findings remain robust even when using this alternative definition of the treatment group.

Figure A2: The Dynamic Effects of the Literary Inquisition on Scientific and Technological Innovation (Alternative definition of the treatment group)



Notes: Figure A2 visualize the estimates of the dynamic effects of the literary inquisition on innovation for the full sample. We obtain the OLS estimates from the dynamic version of the TWFE model (Equation (2)) with the alternative definition of the treatment group, using the groups just before the literary inquisition (i.e., the groups five years prior to the literary inquisition) as the reference. Control variables include all baseline controls in Column (4) of Table 2 in the main text. The bars represent 95% confidence intervals. Standard errors are clustered at the prefectural level.

A4 Controlling for the Impacts of Other Historical Events

As mentioned in the Section 5 in the main text, other historical events in the 18th century may have also had important impacts on scientific and technological innovation at the time. We will discuss these events in details and control for their potential impacts on innovation in our DID framework.

A4.1 The Expulsion of the Jesuits

The first notable historical event is the expulsion of the Jesuits in the 1720s. Emperor Yongzheng launched a policy in 1723 to expel the Jesuits, which may also have negatively impacted scientific and technological activities in China at the time. Ma (2021) highlights that Jesuit scientists introduced European science to China from 1580 onward, resulting in a significant increase in scientific works within prefectures hosting Jesuit scientists. However, this knowledge diffusion in China facilitated by the Jesuits ceased in the 1720s, when the emperor began to expel them owing to the Chinese Rites Controversy with the Pope. Undoubtedly, the expulsion of the Jesuits may have also hindered knowledge diffusion and scientific and technological innovations at the time. We now control for the potential impact of this expulsion policy on innovation in our DID framework.

Ma (2021) categorizes the Jesuits in China into two groups. (1) Jesuit scientists engaged in scientific activities while preaching. (2) Jesuit priests exclusively conducted missionary work. Presumably, only the former would have fostered scientific advancements in the regions they influenced. Following Ma's approach, we include a series of control variables in Equation (1) in the main text, comprising interaction terms between the variables of Jesuit scientists and a dummy variable representing the period of Jesuit expulsion (1721–1780). By doing so, we largely control for the potential impact of the Jesuit expulsion on innovation. In particular, variables associated with Jesuit scientists encompass their presence and number. The former indicates whether Jesuit scientists were present in a prefecture, while the latter is the aggregation of all Jesuit scientists for the decades of their presence in a prefecture preceding the Jesuit expulsion. To further control for the potential impact of the Jesuit expulsion, we also control for interaction terms between the variables of Jesuit priests and Jesuit expulsion dummy. The corresponding estimates of β in Equation (1) in the main text with these controls are presented in Table A6. Columns (1)–(4) of Table A6 show that the estimates change little compared with the baseline results in Table 2 as we add the aforementioned controls in the regressions. These results indicate that the Jesuit expulsion does not contaminate our DID estimates of the effects of the literary inquisition on innovation in the treatment prefectures.

A4.2 The Sea Ban Policy

The second significant event is the sea ban policy implemented by the Qing government after 1650, which may also have affected domestic scientific and technological activities. The Qing rulers began to strictly enforce a ban on maritime trade from 1655, and coastal regions were profoundly impacted by this policy. The ban was initiated to cut off communication between domestic residents and overseas anti-Qing forces and to consolidate the Qing regime. Three decades later, Emperor Kangxi abolished the sea ban policy when anti-Qing forces were defeated and the Qing regime was consolidated (Guo, 1984). However, the rapid development of international trade worried the Qing rulers that such uncontrolled maritime trade may threaten the Qing regime, leading them to reimpose the sea ban policy in the 18th century. In 1717–1727, the Qing government implemented the sea ban policy in Guangdong and Fujian provinces, banning residents there to go to sea and trade with other countries. In 1757, the Qing government began to ban all maritime trade throughout the country, and only kept Guangzhou

Table A6: Robustness Checks: Controlling for the Potential Impacts of Other Historical Events

	Dependent variable: # Innovations									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Literary Inquisition	–0.0428***	–0.0449***	–0.0424***	–0.0443***	–0.0445***	–0.0446***	–0.0445***	–0.0428***	–0.0435***	–0.0446***
	(0.0155)	(0.0156)	(0.0153)	(0.0156)	(0.0156)	(0.0157)	(0.0153)	(0.0153)	(0.0156)	(0.0157)
Jesuit scientist number × Expulsion 1721–1780	Yes									
Jesuit scientist presence × Expulsion 1721–1780		Yes								
Jesuit priest number × Expulsion 1721–1780			Yes							
Jesuit priest presence× Expulsion 1721–1780				Yes						
Coast I ×Sea Ban 1717-1727					Yes					
Coast II ×Sea Ban 1757-1800					Yes					
Tandingrumu						Yes				
Quota × Reform 1724							Yes			
Quota × *keju* 1756								Yes		
Quota × *keju* 1787									Yes	
Banned Books × Censorship 1774										Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y mean	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187	0.0187
Observations	4960	4960	4960	4960	4960	4960	4960	4960	4960	4960
R-squared	0.160	0.158	0.162	0.158	0.159	0.158	0.158	0.158	0.159	0.158

Notes: This table presents the DID estimates of the effect of the literary inquisition on the number of innovations in treatment prefectures after controlling for the potential impacts of other historical events at the time. Specifically, it presents estimates of the coefficient β from Equation (1) with more control variables. We control for the interaction terms between the variables of Jesuit scientists and a dummy of the period of Jesuit expulsion (1721–1780) to control for the potential effect of the Jesuit expulsion on innovation. Moreover, we control for the interaction terms between the dummies of the two periods of the sea ban polices (1717–1727 and 1757–1800) and dummies of the corresponding affected regions in the two periods to absorb the potential effect of the sea ban policies. Jesuit scientist (priest) presence is a dummy that equals 1 if a prefecture had Jesuit scientists (priests) between 1581 and 1720. Jesuit scientist (priest) number is the aggregation of all the Jesuit scientists (priests) for the decades of their presence in each prefecture between 1581 and 1720. Coast I and Coast II are two dummies that indicate the affected regions in the two periods of the sea ban polices (1717–1727 and 1757–1800, respectively). We also control the potential impacts of the *Tandingrumu* policy, changes to the civil exam system and the book banning campaign in the Qianlong reign in Columns 6–9. Baseline controls are the same as those in Column 4 of Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

port as a window to foreign countries. Consequently, maritime trade in 1757–1842 was strictly forbidden across the country except for Guangdong Province.

We control for the potential impact of the sea ban policy in the 18th century on innovation by adding corresponding controls in Equation (1) in the main text. Specifically, we control for interaction terms between the dummies of the two periods of the sea ban policy (i.e., 1717–1727 and 1757–1800) and dummies of the corresponding affected regions in these periods to absorb the potential effects of the policy on innovation (i.e., "Coast I× Sea Ban (1717–1727)" and "Coast II× Sea Ban (1757–1800)"). The variable "Sea Ban (1717–1727)" is a dummy of 1717–1727 period, when the sea ban policy was enforced. "Coast I" is a dummy of coastal prefectures in Guangdong and Fujian provinces affected by this policy. This interaction term is supposed to capture the potential impact of the sea ban policy during 1717–1727 on innovation in the affected regions. Similarly, "Sea Ban (1757–1800)" is a dummy of the 1757–1800 period, when the other sea ban policy was in place. "Coast II" is a dummy of coastal prefectures (excluding Guangzhou) affected by this policy. This interaction term is intended to capture the potential impact of the post-1757 sea ban policy on innovation in the affected regions. Column (5) of Table A6 presents that our DID estimator remains similar to the baseline results after including the two interaction terms.

A4.3 The Tandingrumu Policy

The third historical event is the *Tandingrumu* policy, a significant tax reform implemented in the Yongzheng reign. This reform, transitioning from a poll tax to a property tax, fundamentally altered the tax structure of the Qing Dynasty. Such a change had the potential to impact the geographical distribution of the tax burden, which could, in turn, affect regional scientific and technological activities and land tax revenue.

In the early Qing period, the labor tax and land tax were levied separately. Such a tax system gave rise to many problems and exacerbated the tax burden on peasants (Wang, 2020). In response, the Qing government initiated the *Tandingrumu* policy, simplifying tax assessment by merging labor and land taxes into a single tax collected in silver (Zelin, 1984; Naquin and Rawski, 1987). This reform meant that the total tax owed by households became dependent solely on their cultivated land area (Wang, 2020). The policy was rolled out at the provincial level, and Table A7 demonstrates the specific timings across provinces (Wang, 2020).

To control for the potential impact of the *Tandingrumu* policy on innovation, we introduce an additional control variable in Equation (1) in the main text. Specifically, we construct a dummy variable $Tandingrumu_{pt}$, which equals 1 if prefecture *p* had implemented the policy by time *t*. This variable aims to capture the potential impact of the *Tandingrumu* policy on regional innovation.

Column (6) of Table A6 presents that our DID estimate changes little after we include this dummy variable in the regression. Such result suggests that the effect of the *Tandingrumu* policy on innovation does not significantly confound our analysis of the literary inquisition's impact.

Table A7: The Implementation Time of the *Tandingrumu* Policy across Provinces

Time of implementation	Province
1716	Guangdong
1720	Sichuan
1724	Zhili, Fujian
1725	Shandong
1726	Yunnan, Shaanxi, Zhejiang, Gansu, Jiangsu, Anhui, Jiangxi, Hunan, Guangxi, Hubei
1731	Shanxi
1777	Guizhou

Notes: The data are sourced from Wang (2020).

A4.4 The Changes to the Civil Service Examination System

For more than 1300 years, China recruited its elites with a civil service examination system, and the exam system had profound societal influences, particularly on bureaucracy efficiency, elite circulation, talent allocation, and perceptions of social mobility (Weber, 1915; Chang, 1962; Qian, 1982; Elman, 2000; Bai and Jia, 2016). The Qing government implemented several reforms on the civil exam system in the 18th century, and such institutional changes could potentially impact regional innovation at the time. This section briefly discusses these reforms and evaluates the robustness of our DID estimates after controlling for their potential impacts on innovation.

A4.4.1 The Quota System Reform in 1724

The quota system, pivotal in the civil service examination, determined the number of successful candidates at each exam level, including prefecture and province levels (Bai and Jia, 2016). During the early Qing period, these quotas varied over time. In 1724, Emperor Yongzheng reformed the system, setting fixed quotas at the prefectural level, and this prefectural level quota persisted until 1851 (Bai and Jia, 2016). This reform could potentially affect regional innovation, particularly in prefectures with higher quotas.

To control for the potential impact of this reform on innovation, we introduce an additional control variable in Equation (1) in the main text. We construct an interaction variable $Quota_p \times Reform1724_t$, where $Quota_p$ is the assigned quota for prefecture p in 1724, and $Reform1724_t$ is a time dummy that equals 1 if $t > 1724$. This interaction term aims to absorb the potential impact of the quota system reform on innovation in affected regions. Column (7) of Table A6 presents that our DID estimate remains similar to the baseline estimate after including this interaction term in the regression, confirming the robustness of our results.

A4.4.2 Two Revisions to the Examination Content

The Qing government made two significant content revisions to the civil service examination in the 18th century. The first, in 1756, introduced a poetry composition requirement in eight-rhyme regulated verse. The second revision in 1787 mandated specialization in all Five Classics, as opposed to just one previously (Elman, 2013). These changes increased the exam's difficulty and may have pushed candidates to spend more time learning to write poetry and specializing in all of the *Five Classics*. This could potentially divert their efforts away from developing human capital for modern science, ultimately leading to a decline in S&T in Qing China. Prefectures with higher quotas, typically more developed and intellectually vibrant, might have been more affected.

We control for the potential impacts of these revisions by incorporating two additional interaction terms, $Quota_p \times keju1756_t$ and $Quota_p \times keju1783_t$, in Equation (1) in the main text. Similar to the above controls, $Quota_p$ is the assigned quota for prefecture p in 1724, and $keju1756_t$ and $keju1783_t$ are time dummies indicating years post-1756 and post-1783, respectively. These two interaction terms are intended to capture these revisions' potential impacts on regional innovation. Columns (8) and (9) of Table A6 present that our DID estimates change little after including these terms in the regressions, affirming the robustness of our results.

A4.5 The Book Banning Campaign in the Qianlong Reign

The fifth major historical event is the book banning campaign in the Qianlong reign, which could have also negatively impacted innovation in S&T at the time. Initially, book banning was intertwined with the implementation of the literary inquisition, which mandated the prohibition of any book implicated in a literary inquisition case. These early instances of banning were sporadic, serving merely as part of the punitive measures in specific literary inquisition cases.

A more structured approach was adopted in 1774 when Emperor Qianlong launched a systematic, nationwide campaign to ban "seditious" books (Guy, 1987). Preceding this initiative, he launched a major project to revise and compile a vast array of books, known as the "Complete Library in Four Treasuries." This project necessitated a comprehensive national effort to collect books, during which Emperor Qianlong identified numerous texts with "seditious" content. He then planned to confiscate all seditious materials across the nation through the opportunity of compiling the "Complete Library in Four Treasuries" (An and Zhang, 1990). To encourage people to voluntarily hand over seditious books, Emperor Qianlong promised not to punish those who proactively submitted them. By August

1774, Emperor Qianlong mandated provincial officials to conduct stringent inspections of the books submitted, leading to the destruction of those deemed seditious. This rigorous campaign of censorship continued until 1793 (Wang and Huang, 1993).

Although the book banning campaign initiated in 1774 could potentially have exerted a significant influence on innovation in S&T, it does not account for the marked decline in the number of technological innovations in China observed after 1711, as presented in Figure 1. Nonetheless, it remains imperative to control for the potential impacts of this campaign on innovation in our regression analysis. To assess the impact of the book banning campaign across different regions, we sourced data on the number of distinct books banned in each province from Lei (1989). We divide the total number of distinct banned books in each province by the number of prefectures in each province to obtain the number of distinct banned books in each prefecture during the book banning campaign. This statistics somewhat reflects the extent to which each prefecture was affected by the campaign.

We control for the potential impact of book banning campaign on innovation by adding corresponding controls in the regressions. Specifically, we construct an interaction term $BannedBooks_p \times Censorship1774_t$, where $BannedBooks_p$ denotes the number of distinct book types banned in prefecture p during the campaign, and $Censorship1774_t$ is a binary variable that equals 0 before 1774 and 1 thereafter. This variable was incorporated into the baseline regression model (Equation (1) in the main text). Column (10) of Table A6 presents that our result remains robust after including this variable in the regression.

A5 Heterogeneous Analysis

Our analysis reveals that the literary inquisition had a significant negative effect on scientific and technological innovation in Qing China. However, this impact may show substantial heterogeneity across different types of innovation. In general, innovations in S&T in our dataset can be categorized into two groups: (1) Innovations documented in books and reliant on textual dissemination, such as the proof of a fundamental mathematical theorem; (2) Technological inventions manifested as physical objects, such as the invention of gunpowder.

As previously discussed, the literary inquisition potentially discouraged intellectuals from writing and publishing works on all subjects, including S&T. Consequently, book-dependent innovations that relied primarily on textual dissemination were likely more severely impacted compared to those embodied as physical artifacts. This section explores the heterogeneous impacts of the literary inquisition on various types of innovations in the Qing Dynasty.

Table A8: The Effect of the Literary Inquisition on Different Types of Innovation

	Dependent Variable: # Innovations			
	(1)	(2)	(3)	(4)
	Panel A: Innovation Documented in Books			
Literary Inquisition	–0.0415**	–0.0383**	–0.0399***	–0.0407***
	(0.0163)	(0.0151)	(0.0153)	(0.0154)
Y mean	0.0169	0.0169	0.0169	0.0169
Observations	4960	4960	4960	4960
R-squared	0.102	0.126	0.131	0.156
	Panel B: Innovation Produced in Practice			
Literary Inquisition	-0.0039	-0.0044	-0.0042	-0.0040
	(0.0028)	(0.0029)	(0.0029)	(0.0028)
Y mean	0.0018	0.0018	0.0018	0.0018
Observations	4960	4960	4960	4960
R-squared	0.075	0.096	0.114	0.123
Prefecture FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE ×Time FE	Yes	Yes	Yes	Yes
Treat × After1790	Yes	Yes	Yes	Yes
Jinshi ×Time FE	No	Yes	Yes	Yes
Pop density1630 ×Time FE	No	Yes	Yes	Yes
Rice ×Time FE	No	No	Yes	Yes
Foxtail millet ×Time FE	No	No	Yes	Yes
Sweet potato ×Time FE	No	No	Yes	Yes
Language polarization ×Time FE	No	No	No	Yes
Language fragmentation ×Time FE	No	No	No	Yes
Coastal ×Time FE	No	No	No	Yes
Main river ×Time FE	No	No	No	Yes

Notes: This table examines the heterogenous effect of the literary inquisition on the number of innovations in treatment prefectures. Specifically, it presents estimates of the coefficient β from Equation (1) in the main text. Panels (A) and (B) present the results with book-dependent innovations and physical-artifact innovations as outcome variables, respectively. The control variables are identical to those presented in Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

We categorize all innovations into subsets dependent on books and physical artifacts to assess the impacts of the literary inquisition on each category. We hypothesize a more pronounced detrimental effect of the literary inquisition on innovations dependent on books. The DID estimation results, presented in Table A8, support this hypothesis. Specifically, Panel A shows that the estimated coefficients for book-dependent innovations are significantly negative and robust, with the coefficient in the final column, after controlling for all variables, being -0.04. This suggests a 50% reduction in book-dependent innovations in the treatment prefectures. Conversely, Panel B, which presents results for physical-artifact innovations, shows coefficients that are negative but not statistically significant, indicating that the literary inquisition's impact on these innovations was not substantial.

A6 The Propensity Score Matching Approach

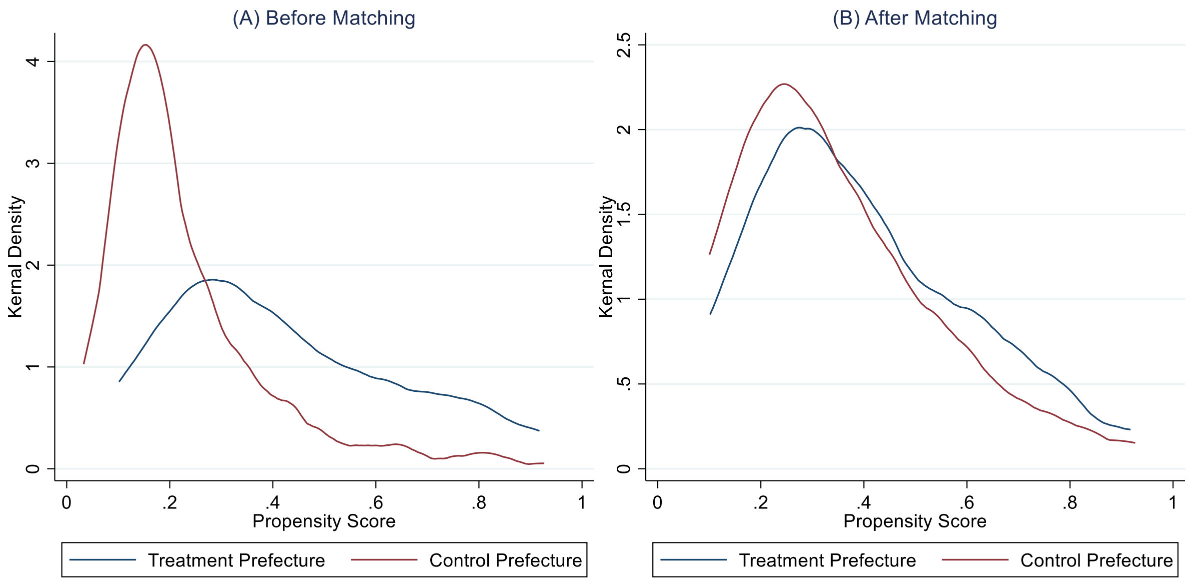
As discussed in the main text, we employ matching to reduce heterogeneity in the sample. After matching, there are no longer systematic differences between treatment and control prefectures prior to the treatment and the DID estimators are likely to capture the treatment effects of the literary inquisition on innovation.

In practice, we generate a propensity score for each prefecture by estimating:

$$Prob\left(Literary\ Inquisition_p = 1\right) = F(X_i) \qquad (A1)$$

where $Prob$ is the probability that a prefecture was exposed to the literary inquisition and X_i is the vector of covariates. We include all baseline controls in Column (4) of Table 2 in the main text in our set of covariates.

Figure A3: Propensity Score Matching: Distributions of the Propensity Scores Before and After Matching



Notes: Panels (A) and (B) show the propensity score distributions for the treatment and control prefectures, before and after matching, respectively.

We adopt the single nearest-neighbor match strategy. This strategy requires us to select an appropriate caliper width to complete the matching, and such a selection needs to strike a balance between generating close matches for efficiency and avoiding the exclusion of too many observations (Lunt, 2014). We select the proper caliper width on the basis of Cochran and Rubin (1973). Cochran and Rubin (1973) explore the rules of caliper width choices under different ratios of the variance of the propensity score in the treated group (σ_1^2) to that in the untreated group (σ_2^2). Their results suggest that given the same caliper width, the smaller σ_1^2/σ_2^2 ratio, the more bias can be reduced. If σ_1^2/σ_2^2 equals 2, a 0.2 standard deviations of the propensity score can effectively reduce bias by 98%. In our case, the σ_1^2/σ_2^2 ratio is smaller than 2 ($\sigma_1^2/\sigma_2^2 = 1.93$), and thus we select a caliper width of 0.2 standard deviations of the propensity score (0.04), which can effectively reduce bias by more than 98%.

Table A9: Balance of the Sample: Matching Covariates

	Panel A: Before Matching				
	Treatment Prefectures		Control Prefectures		
Variables	Obs.	Mean	Obs.	Mean	Diff in Mean
Coast	71	0.225	177	0.102	0.124**
Major river	71	0.634	177	0.621	0.012
Jinshi	71	82.986	177	26.424	56.562***
Population density1630	71	142.672	177	59.465	83.206***
Rice suitability	71	0.183	177	0.154	0.030
Foxtail millet suitability	71	0.097	177	0.083	0.014
Sweet potato suitability	71	2.391	177	1.855	0.536***
Language polarization index	71	2.980	177	2.884	0.096
Language fragmentation index	71	2.440	177	2.664	–0.225
	Panel B: After Matching				
	Treatment Prefectures		Control Prefectures		
Variables	Obs.	Mean	Obs.	Mean	Diff in Mean
Coast	67	0.194	44	0.205	–0.011
Major river	67	0.627	44	0.523	0.104
Jinshi	67	74.925	44	48.250	26.675
Population density1630	67	131.970	44	107.867	24.103
Rice suitability	67	0.194	44	0.178	0.016
Foxtail millet suitability	67	0.103	44	0.090	0.013
Sweet potato suitability	67	2.362	44	2.377	–0.015
Language polarization index	67	2.971	44	3.137	–0.166
Language fragmentation index	67	2.471	44	2.316	0.155

Notes: This table presents the differences between prefectures that were exposed to the literary inquisition and those that were not regarding their pre-treatment covariates. The covariates include two geographic dummies, namely, Coastal (whether a prefecture is situated on the coast), Main river (whether a prefecture includes at least one major river); and other prefectural characteristics: *Jinshi* (number of *jinshi* in 1600–1710), Population density (population density in 1630), agricultural suitability metrics for wetland rice, fox millet, and sweet potato, Language polarization (the language polarization index), Language fragmentation (the language fragmentation index).

Table A9 presents the balance of the geographical, economic, and human capital characteristics across the treatment and control prefectures, both before and after matching. Panel A of Table A9 clearly shows significant differences in these observable characteristics between the two groups before matching. However, as shown in Panel B of Table A9, we obtain a balanced sample with no observable differences between the treatment and control prefectures after matching. We now use this matched sample, in which the treatment and control prefectures are similar prior to the treatment, to estimate the effects of the literary inquisition on innovation in the treatment prefectures.

Figure A3 presents the distributions of the propensity scores for treatment and control prefectures before and after matching with a caliper width of 0.04. Evidently, the matching significantly improves the similarity between the treatment and control prefectures. Consistent with Table A9, treatment and control prefectures show no significant differences in observable characteristics after matching.

A7 Robustness Checks for the Estimates of the Spillover Effect

As discussed in the main text, when examining the potential spillover effect of the literary inquisition on innovation, we select a distance of 60 km as the cutoff between the close and distant control prefectures. This decision is based on the reasoning that a two-day walking distance might be a reasonable measure for information spread at the time.

Table A10: Robustness Checks: Spillover Effect of the Literary Inquisition on Innovation

	Dependent variable: # innovations			
	Full Sample		Matched Sample	
	Sub I	Sub II	Sub I	Sub II
	(1)	(2)	(3)	(4)
	Panel A: 30km			
Literary Inquisition	–0.0441***	–0.0571**	–0.0649***	–0.0865**
	(0.0165)	(0.0252)	(0.0243)	(0.0380)
Baseline Controls	Yes	Yes	Yes	Yes
p-value		0.339		0.220
Y mean	0.0239	0.0273	0.0314	0.0388
Observations	3520	2860	2040	1520
R-squared	0.178	0.269	0.243	0.356
	Panel B: 90km			
Literary Inquisition	–0.0434***	–0.0601**	–0.0641***	–0.0889**
	(0.0162)	(0.0273)	(0.0240)	(0.0396)
Baseline Controls	Yes	Yes	Yes	Yes
p-value		0.256		0.177
Y mean	0.0219	0.0307	0.0302	0.0410
Observations	3840	2540	2120	1440
R-squared	0.173	0.284	0.239	0.366

Notes: This table examines the robustness of the estimates of the spillover effect of the literary inquisition on innovation for the full and matched samples, respectively. Specifically, it presents estimates of the coefficient β from Equation (1) for the two sub-samples constructed from the full and matched samples. We construct two sub-samples to perform the DID analysis to investigate the potential spillover effect. Sub-sample I includes all treatment prefectures and closely located control prefectures within 30 km (Panel A) or 90 km (Panel B) from the treatment prefectures' borders. Sub-sample II includes all treatment prefectures and distant control prefectures over 30 km (Panel A) or 90 km (Panel B) from the treatment prefectures' borders. Baseline controls are the same as those in Column 4 of Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Our results are robust to the selection of this cutoff distance, remain consistent even when we adjust the cutoff to 30 km or 90 km. Panels A and B of Table A10 present the corresponding results for these alternative distances, which are similar to the benchmark results shown in Table 4 of the main text, thereby confirming the robustness of our findings on the literary inquisition's spillover effect on innovation.

Alternatively, we could define close control prefectures as those directly adjacent to the treatment ones (where the distance equals 0) and classify all other non-adjacent prefectures as distant controls. However, this approach has limitations. In particular, there are only 71 treatment prefectures and 46 control ones for the matched sample, and only a few control prefectures are adjacent to the treatment prefectures, making it difficult to identify the potential spillover effect for this sample.

Thus, if we impose the strict restriction that the close prefectures must be adjacent to the treatment ones, our analysis can only be conducted on the full sample of all prefectures. In this approach, we define close control prefectures as those adjacent to the treatment prefectures and distant control prefectures as those located further from the borders of the treatment prefectures. This distinction enhances the precision in detecting potential spillover effects. Our data analysis reveals that approximately 50% and 25% of control prefectures lie beyond 800 km and 1000 km from the treatment prefectures' borders, respectively.

Table A11: Further Estimates of the Spillover Effect of the Literary Inquisition on Innovation

	Dependent variable: # innovations		
	0 km	800 km	1000 km
	Sub III	Sub IV	Sub V
	(1)	(2)	(3)
Literary Inquisition	–0.0444***	–0.0810**	–0.0818**
	(0.0167)	(0.0367)	(0.0368)
Baseline Controls	Yes	Yes	Yes
p-value		0.0643	0.0604
Y mean	0.0243	0.0466	0.0486
Observations	3460	1480	1420
R-squared	0.179	0.329	0.333

Notes: This table presents further estimates of the spillover effect of the literary inquisition on innovation for the full sample. Specifically, it presents estimates of the coefficient β from Equation (1) for the three sub-samples. Specifically, Sub-sample III includes all treatment prefectures and their adjacent control prefectures; Sub-sample IV comprises all treatment prefectures and distant (beyond 800 km) control prefectures; and Sub-sample V comprises all treatment prefectures and more distant (beyond 1000 km) control prefectures. Baseline controls are the same as those in Column 4 of Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

To perform the DID analysis, we construct three sub-samples: Subsample III, which includes all treatment prefectures and their adjacent control prefectures; Subsample IV, which includes treatment prefectures and control prefectures situated more than 800 km away; and Subsample V, which includes treatment prefectures and even more distant control prefectures, beyond 1000 km. Due to the limited number of adjacent control prefectures in our matched sample, this analysis is confined to the full sample. The results, presented in Table A11, show that the estimates from Subsamples IV and V are significantly larger (in absolute value) than those from Subsample III, with a p-value around 0.06. These findings provide strong evidence of the literary inquisition's spillover effect on innovation.

A8 Procedure for Obtaining the CATE Using Causal Forrest Method

As noted in the main text, the causal forest method is a recently developed supervised machine learning technique used for predicting heterogeneity in causal treatment effects (Athey and Imbens, 2016; Wager and Athey, 2018; Athey et al., 2019; Britto et al., 2022). The goal of the method is to estimate the Conditional Average Treatment Effect (CATE) for each prefecture. The CATE is defined as $E(Y_{1i} - Y_{0i}|X_i = x)$, where Y_{1i} and Y_{0i} denote the potential outcomes of interest for the *i*th prefecture when treated and untreated, and X is a vector of observable characteristics (Britto et al., 2022).

Athey et al. (2019) provide a guideline to the implementation of the causal forest. Given that our difference-in-differences setting is different from the common application based on randomized control trials (e.g., Davis and Heller, 2017; Bertrand et al., 2017), we follow Britto et al. (2022) and run the causal forest over first-differences. In this way, the treatment group indicator is orthogonal to the covariates, and thus the unconfoundness assumption in Wager and Athey (2018) is satisfied (Britto et al., 2022). Similar to Britto et al. (2022), we match each treatment prefecture with a control one and assign the treatment time of the treatment prefecture to the matched control prefecture as a placebo treatment time. The matching procedure is same to that in Section A4. We compute the innovation levels (measured by the average number of S&T innovations per five years during a period) for each prefecture both before and after the treatment. By calculating the difference between the post- and pre-treatment innovation levels within each prefecture, we generate the first-difference variable. This variable is intended to reflect the change in innovation levels resulting from the treatment and is employed as the outcome variable in the causal forest analysis.

As shown in Britto et al. (2022), the algorithm of the causal forest begins by building trees, each formed through data-driven splits in the sample that define distinct leaves. We set the minimum number of treatment and control observations allowed in a leaf to the default value (5). These leaves are then used to estimate the causal effect of a treatment, based on the specific characteristics (X) of each subgroup (Britto et al., 2022). The characteristics X included into the causal forest consist of all the control variables in Column (4) of Table 2 in the main text and the province-fixed-effects dummies.

To avoid over fitting, we follow Britto et al. (2022) and adopt the “honest approach”. Specifically, we randomly split the sample in two equal parts, with one part being used to define the sample splits (leaves) and the other part being used for estimating the predicted CATE. We repeat the procedure multiple times and ultimately build 2000 trees (the default value), with the final causal forest prediction being a weighted average over the predictions in each tree. Upon completion, the causal forest method yields the predicted Conditional Average Treatment Effect (CATE) for each prefecture. Figure 8 present the obtained results.

A9 More Robust DID Estimation Results

A9.1 More Results on the Effect of the Literary Inquisition on Innovation

As discussed in the main text, the TWFE model yields consistent estimates only under strong assumptions that treatment effects are homogeneous across treated groups and over time. We thus replicate our baseline results demonstrated in the main text using the robust estimators proposed by Borusyak et al. (2021), Callaway and Sant’Anna (2021), De Chaisemartin and d’Haultfoeuille (2020), and Sun and Abraham (2021). These estimators, which shut down the 2×2 difference in differences comparisons between newly-treated and already-treated units, are designed to be consistent even in the presence of heterogeneous treatment effects across treated units and over time.

Table A12 presents these alternative DID estimators on the effect of the literary inquisition on innovation for the full and matched samples, respectively. Panel A of Table A12 shows that the robust DID estimators for the full sample are generally larger than those baseline TWFE estimates presented in Table 2 in the main text. Although the robust estimators obtained from Callaway and Sant’Anna (2021) and De Chaisemartin and d’Haultfoeuille (2020) are not precisely estimated, the other estimators are all significant at the 1% level, which present strong evidence that our baseline results in the main text are robust to a large extent.

Panel B of Table A12 shows that the robust DID estimators for the matched sample are similar to the corresponding baseline TWFE estimates presented in Table 2 in the main text. Once more, while the robust estimators obtained from Callaway and Sant’Anna (2021) and De Chaisemartin and d’Haultfoeuille (2020) are not precisely estimated, the other two robust estimators are precisely estimated and significant, which confirms the robustness of our baseline results presented in the main text.

Table A12: Alternative DID Estimators of the Effect of the Literary Inquisition on Innovation

	Point Estimate	Standard Error	p-value	Lower Bound 95% Confidence Interval	Upper Bound 95% Confidence Interval
Panel A: Full Sample					
Borusyak-Jaravel-Spiess	–0.0377	0.0141	0.0074	–0.0653	–0.0101
De Chaisemartin-D'Haultfeuille	–0.0670	0.0432	0.1208	–0.1517	0.0177
Callaway-Sant'Anna	–0.0539	0.0476	0.2576	–0.1473	0.0394
Sun-Abraham	–0.0920	0.0133	0.0000	–0.1182	–0.0659
Panel B: Matched Sample					
Borusyak-Jaravel-Spiess	–0.0446	0.0168	0.0077	–0.0775	–0.0118
De Chaisemartin-D'Haultfeuille	–0.0515	0.0435	0.2367	–0.1367	0.0338
Callaway-Sant'Anna	–0.0576	0.0456	0.2061	–0.1470	0.0317
Sun-Abraham	–0.0534	0.0094	0.0000	–0.0719	–0.0350

Notes: This table presents the robustness of our baseline estimates in Tables 2 and 3 in the main text to use the alternative robust DID estimators introduced by Borusyak et al. (2021), Callaway and Sant'Anna (2021), De Chaisemartin and d'Haultfoeuille (2020), and Sun and Abraham (2021). We control the same variables in Column (4) of Table 2 in the main text in all regressions. See Borusyak et al. (2021), Callaway and Sant'Anna (2021), De Chaisemartin and d'Haultfoeuille (2020), and Sun and Abraham (2021) for the discussions about how they construct the estimators and why these estimators are robust to heterogenous treatment effects across treated units and over time. Standard errors are clustered at the prefectural level.

A9.2 More Results on the Impact of the Literary Inquisition on Land Tax Revenue

In the main text, we estimate an event-study version of the TWFE model and present the results in Figure 10, which verifies that the common trends assumption for our DID strategy is likely to hold. However, the fully dynamic version of the TWFE model delivers consistent estimates only when the treatment effects are homogeneous across groups and over time (Sun and Abraham 2021). We thus further present the event-study figures generated by a set of recently developed robust estimators in the presence of treatment heterogeneity (De Chaisemartin and d'Haultfoeuille, 2020; Borusyak et al., 2021; Callaway and Sant'Anna, 2021; Sun and Abraham, 2021). Figure A4 demonstrates the obtained results. Figure A4 looks very similar to Figure 10 in the main text, which confirms the robustness of our results.

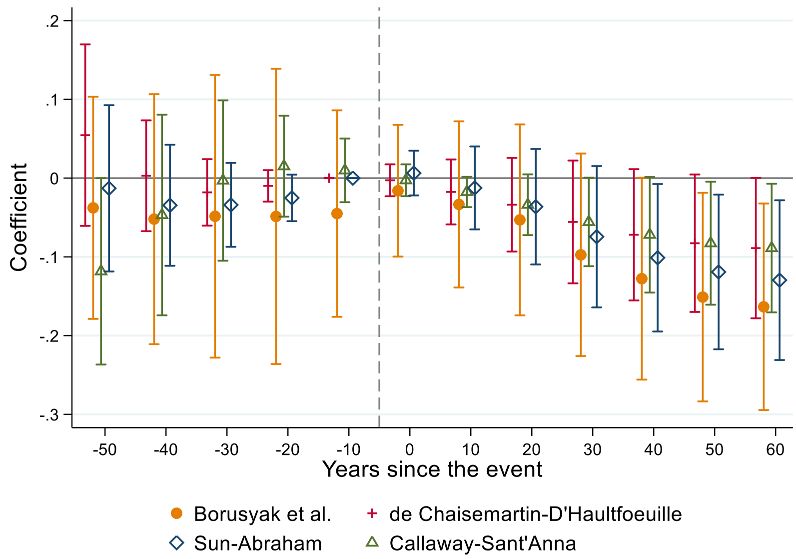
We now estimate the TWFE model to investigate the overall effects of the literary inquisition on the land tax revenue in the treatment prefectures. Specifically, we estimate the following equation:

$$\ln\left(LandTax_{pt}\right) = \beta Literary\ Inquisition_{pt} + \theta X_p \times \gamma_t + Tandingrumu_{pt} + \lambda_p + \gamma_t + \delta_{prov} \times \gamma_t + \epsilon_{pt} \qquad (A2)$$

This equation is similar to Equation (1) in the main text, except that here the dependent variable $ln\ (LandTax_{pt})$ is the logarithm of land tax revenue in prefecture p in time *t*.

Table A13 reports the estimates of β obtained from Equation A2. Columns (1) – (4) of Table A13 present that the estimates change little as we gradually add control variables in the regressions. Specifically, the estimates are around -0.08 and not significant. Given that the literary inquisition may only negatively affect the land tax revenue in the treatment prefectures in the long term, it is not difficult to explain such insignificant DID estimates which capture the overall effects of the literary inquisition on land tax.

Figure A4: The Dynamic Effects of the Literary Inquisition on Land Tax Revenue: Staggered Treatment Correction



Notes: This figure presents the estimates of the dynamic effects of the literary inquisition on land tax revenue, employing four alternative estimators. These include: Callaway and Sant'Anna (2021) (in green with triangle markers); Sun and Abraham (2021) (in blue with diamond markers); De Chaisemartin and d'Haultfoeuille (2020) (in red with cross markers); and Borusyak et al. (2021) (in orange with circle markers). The outcome variable is the logarithm of land tax revenue and control variables include all the baseline controls in Column (4) of Table A9. The groups 10 years prior to the literary inquisition are used as the reference. The bars represent 95 percent confidence intervals. Standard errors are clustered at the prefectural level.

Similar to Table A12, Table A14 presents more robust DID estimators of the impact of the literary inquisition on land tax revenue that allow for heterogenous treatment effects. Although one of these estimators are not precisely estimated and thus insignificant, the other three estimators are negative and significant, and the estimates are between -0.05 and -0.09. These results indicate that the literary inquisition may have a modest negative effect on the land tax revenue in the affected regions.

Table A13: The DID Estimates of the Effect of the Literary Inquisition on Land Tax Revenue in the Treatment Prefectures

	Dependent variable: ln (land tax revenue)			
	(1)	(2)	(3)	(4)
Literary Inquisition	–0.137**	–0.112**	–0.0890*	–0.0826
	(0.0545)	(0.0561)	(0.0534)	(0.0525)
Prefecture FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE × Time FE	Yes	Yes	Yes	Yes
Tandingrumu	Yes	Yes	Yes	Yes
Land area × Time FE	Yes	Yes	Yes	Yes
Basin HHI × Time FE	Yes	Yes	Yes	Yes
Jinshi × Time FE	No	Yes	Yes	Yes
Pop density1630 × Time FE	No	Yes	Yes	Yes
Rice × Time FE	No	No	Yes	Yes
Fox millet × Time FE	No	No	Yes	Yes
Sweet potato × Time FE	No	No	Yes	Yes
Language polarization × Five FE	No	No	No	Yes
Language fragmentation × Five FE	No	No	No	Yes
Coastal × Time FE	No	No	No	Yes
Main river × Time FE	No	No	No	Yes
Observations	3078	3078	3078	3078
R-squared	0.571	0.580	0.596	0.602

Notes: This table presents the DID estimates of the effect of the literary inquisition on the land tax revenue in the treatment prefectures. Specifically, it presents estimates of the coefficient β from Equation (A2). The control variables are identical to those presented in Table A9. Standard errors in parentheses are clustered at the prefectural level.

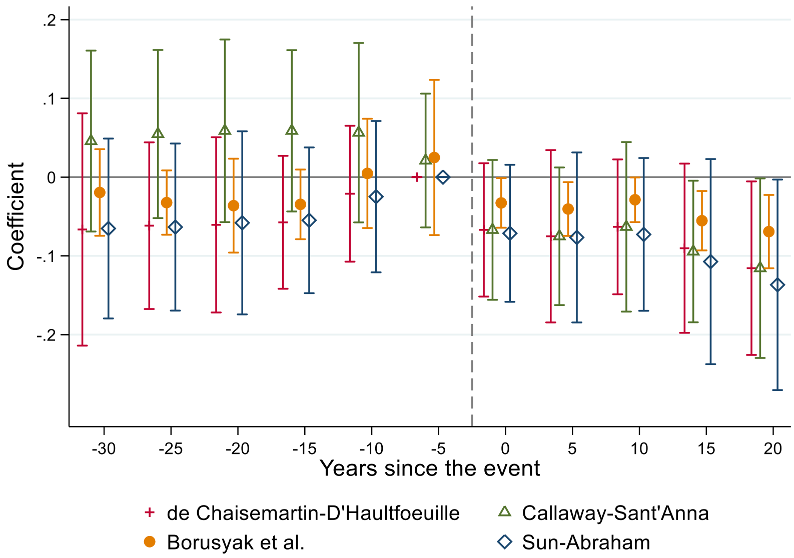
Table A14: Alternative Difference-in-Differences Estimators (Land Tax Revenue)

	Point Estimate	Standard Error	p-value	Lower Bound 95% Confidence Interval	Upper Bound 95% Confidence Interval
Borusyak-Jaravel-Spiess	–0.0901	0.0543	0.0970	–0.1966	0.0163
De Chaisemartin-D'Haultfeuille	–0.0027	0.0103	0.7939	–0.0229	0.0176
Callaway-Sant'Anna	–0.0489	0.0283	0.0836	–0.1044	0.0065
Sun-Abraham	–0.0667	0.0344	0.0524	–0.1340	0.0007

Notes: This table presents robustness of our baseline estimates in Table A7 to use the alternative DID estimators introduced by Borusyak et al. (2021), Callaway and Sant'Anna (2021), De Chaisemartin and d'Haultfoeuille (2020), and Sun and Abraham (2021). We control the same variables in Column (4) of Table A7 in all regressions. Standard errors in parentheses are clustered at the prefectural level.

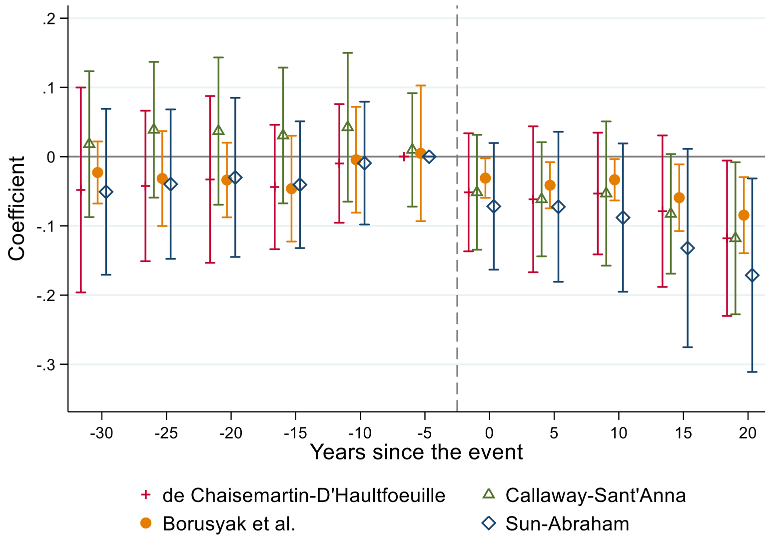
A10 Additional Figures and Tables

Figure A5: Dynamic Effects of the Literary Inquisition on Scientific and Technological Innovation: Staggered Treatment Correction



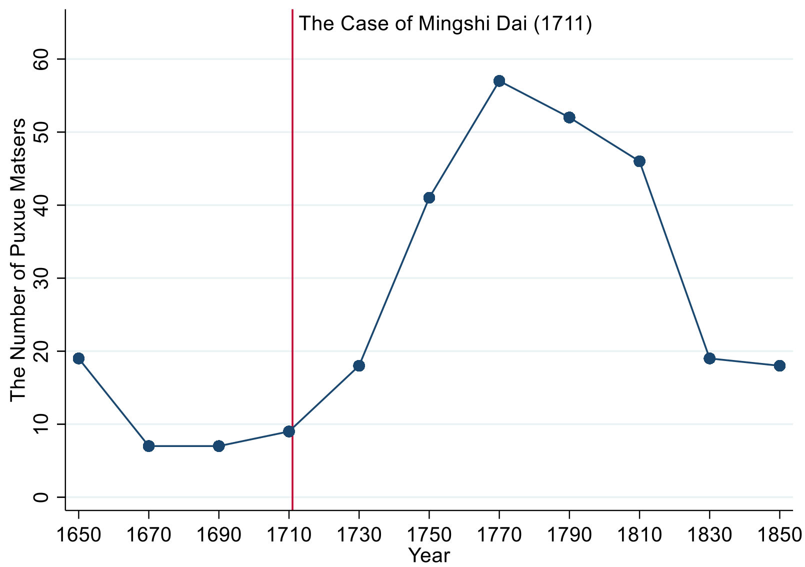
Notes: This figure presents the estimates of the dynamic effects of the literary inquisition on innovation, employing four alternative estimators. These include: Callaway and Sant'Anna (2021) (in green with triangle markers); Sun and Abraham (2021) (in blue with diamond markers); De Chaisemartin and d'Haultfoeuille (2020) (in red with cross markers); and Borusyak, Jaravel, and Spiess (2021) (in orange with circle markers). The outcome variable is the number of scientific and technological innovations (at the prefectural level), and control variables include all baseline controls in Column (4) of Table 2. The groups five years prior to the literary inquisition are used as the reference. The bars represent 95% confidence intervals. Standard errors are clustered at the prefectural level.

Figure A6: Dynamic Effects of the Literary Inquisition on Scientific and Technological Innovation: Staggered Treatment Correction (the Matched Sample)



Notes: This figure presents the estimates of the dynamic effects of the literary inquisition on innovation for the matched sample, employing four alternative estimators. These include: Callaway and Sant'Anna (2021) (in green with triangle markers); Sun and Abraham (2021) (in blue with diamond markers); De Chaisemartin and d'Haultfoeuille (2020) (in red with cross markers); and Borusyak, Jaravel, and Spiess (2021) (in orange with circle markers). The outcome variable is the number of scientific and technological innovations (at the prefectural level), and control variables include all baseline controls in Column (4) of Table 2. The groups five years prior to the literary inquisition are used as the reference. The bars represent 95% confidence intervals. Standard errors are clustered at the prefectural level.

Figure A7: The Number of *Puxue* Masters in China (1650-1850)



Notes: This figure presents the number of *puxue* masters born in different periods. Each point represents the number of *puxue* masters born in the past 20 years. Data on *puxue* masters are from Zhi (1925), which records the biographical information of all *puxue* masters in the Qing Dynasty. Unfortunately, this book does not contain the information on the *puxue* masters' birth years. Thus, we further identify the *puxue* masters in another data set, i.e., Chinese Biographical Database (CBDB), and finally obtain a sample of 318 *puxue* masters with complete information.

Table A15: Data Sources and Summary Statistics for the Control Variables

	Sources	Obs.	Mean	S.D.
Panel A: 1701-1800				
Controls				
Whether a prefecture is situated on the coast	1	248	0.137	0.344
Whether a prefecture includes one or more major rivers[1]	1	248	0.625	0.484
The number of *jinshi* in 1600–1710	2	248	42.617	67.199
Population density in 1630 (population/km^2)	2	248	83.287	118.513
Agricultural suitability for wetland rice	1	248	2.008	1.061
Agricultural suitability for foxmillet	1	248	2.912	1.312
Agricultural suitability for sweet potato	1	248	2.600	0.997
Language polarization index	1	248	0.162	0.299
Language fragmentation index	1	248	0.087	0.164
Panel B: 1680-1850				
Controls				
Whether a prefecture is situated on the coast	1	171	0.187	0.390
Whether a prefecture includes one or more major rivers	1	171	0.696	0.460
The number of *jinshi* in 1600–1710	2	171	61.766	89.696
Population density in 1630 (population /km^2)	2	171	92.803	131.981
Language polarization index	1	171	0.185	0.305
Language fragmentation index	1	171	0.099	0.170
Agricultural suitability for wetland rice	1	171	2.201	1.017
Agricultural suitability for foxmillet	1	171	2.796	1.298
Agricultural suitability for sweet potato	1	171	2.644	0.854
Land area (1000 km^2)	2	171	20.710	19.717
Basin HHI	1	171	0.619	0.226

Note: Major rivers are those ranked as first- and second-order streams in the Chinese river hierarchy.
Source: 1.Bai and Jia (2016).
2.Ma (2021).

Table A16: DID Estimates of the Effect of the Literary Inquisition on Innovation (excluding the interaction term $Treat_p \times After1790_t$)

	Dependent Variable: # Innovations			
	(1)	(2)	(3)	(4)
Literary Inquisition	–0.0287*	–0.0320**	–0.0328**	–0.0323**
	(0.0146)	(0.0155)	(0.0157)	(0.0159)
Y mean	0.0187	0.0187	0.0187	0.0187
Observations	4960	4960	4960	4960
R-squared	0.102	0.127	0.133	0.157
Prefecture FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE × Time FE	Yes	Yes	Yes	Yes
Jinshi ×Time FE	No	Yes	Yes	Yes
Pop density1630 ×Time FE	No	Yes	Yes	Yes
Rice ×Time FE	No	No	Yes	Yes
Foxtail millet ×Time FE	No	No	Yes	Yes
Sweet potato ×Time FE	No	No	Yes	Yes
Language polarization ×Time FE	No	No	No	Yes
Language fragmentation ×Time FE	No	No	No	Yes
Coastal ×Time FE	No	No	No	Yes
Main river ×Time FE	No	No	No	Yes

Notes: This table examines the effect of the literary inquisition on the number of innovations in treatment prefectures. Specifically, it presents estimates of the coefficient β from Equation (1) in the main text. The variable $Treat_p \times After1790_t$ is excluded from all regressions, while other control variables remain consistent with those presented in Table 2 of the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A17: The Effect of the Literary Inquisition on Innovation (Using Sample of Prefectures that Reported at Least One Innovation Throughout the Century)

	Dependent Variable: # Innovations			
	(1)	(2)	(3)	(4)
Literary Inquisition	-0.240**	-0.265**	-0.298**	-0.292*
	(0.0882)	(0.120)	(0.142)	(0.170)
Y mean	0.145	0.145	0.145	0.145
Observations	640	640	640	640
R-squared	0.381	0.465	0.526	0.724
Prefecture FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE × Time FE	Yes	Yes	Yes	Yes
Treat × After1790	Yes	Yes	Yes	Yes
Jinshi ×Time FE	No	Yes	Yes	Yes
Pop density1630 ×Time FE	No	Yes	Yes	Yes
Rice ×Time FE	No	No	Yes	Yes
Foxtail millet ×Time FE	No	No	Yes	Yes
Sweet potato ×Time FE	No	No	Yes	Yes
Language polarization ×Time FE	No	No	No	Yes
Language fragmentation ×Time FE	No	No	No	Yes
Coastal ×Time FE	No	No	No	Yes
Main river ×Time FE	No	No	No	Yes

Notes: This table examines the effect of the literary inquisition on the number of innovations in treatment prefectures, using the sample of prefectures that reported at least one innovation throughout the century. Specifically, it presents estimates of the coefficient β from Equation (1) in the main text. The control variables are identical to those presented in Table 2 in the main text. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A18: Estimates of the Dynamic Effects of the Literary Inquisition on Land Tax Revenue

	Dependent variable: ln (land tax revenue)			
	Years since the event	Coefficients	Years since the event	Coefficients
	[–50, –40)	0.00959	[20, 30)	–0.0485
		(0.0508)		(0.0353)
	[–40, –30)	–0.0120	[30, 40)	-0.0804^{*}
		(0.0380)		(0.0421)
	[–30, –20)	–0.0150	[40, 50)	-0.101^{**}
		(0.0253)		(0.0408)
	[–20, –10)	–0.0111	[50, 60)	-0.118^{***}
		(0.0123)		(0.0406)
	[0, 10)	–0.00588	[60, 70)	-0.127^{***}
		(0.0130)		(0.0405)
	[10, 20)	–0.0262		
		(0.0254)		
Prefecture FE		Yes		Yes
Time FE		Yes		Yes
Province FE × Time FE		Yes		Yes
Tandingrumu		Yes		Yes
Land area × Time FE		Yes		Yes
Basin HHI × Time FE		Yes		Yes
Rice × Time FE		Yes		Yes
Fox millet × Time FE		Yes		Yes
Sweet potato × Time FE		Yes		Yes
Jinshi × Time FE		Yes		Yes
Pop density 1630 × Time FE		Yes		Yes
Language polarization × Time FE		Yes		Yes
Language fragmentation × Time FE		Yes		Yes
Coastal × Time FE		Yes		Yes
Main river × Time FE		Yes		Yes
Observations				3078
R-squared				0.601

Notes: This table presents the coefficients visualized in Figure 10. Except for the prefecture fixed effects, time fixed effects, and interaction of province and time fixed effects, we also control for a series of interaction terms of the time fixed effects and the following prefectural characteristics in the regressions: Land area, Basin HHI (basin fragmentation index), agricultural suitability metrics for wetland rice, fox millet, and sweet potato, *Jinshi* (number of *jinshi* in 1600–1710), Population density (population density in 1630), Language polarization index, Language fragmentation index, and two geographic dummies: Coast (whether a prefecture is situated on the coast), Main river (whether a prefecture includes at least one major river). Additionally, we control for the potential impact of the *Tandingrumu* policy by including a dummy variable $Tandingrumu_{pt}$ in the regression. Standard errors in parentheses are clustered at the prefectural level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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