

## TOP-DOWN LEGISLATION *VERSUS* LOCAL TRADITIONS

Entrepreneurship and Innovation Strategies in the Lombardo-Veneto Kingdom

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# Top-Down Legislation *versus* Local Traditions

## Entrepreneurship and Innovation Strategies in the Lombardo-Veneto Kingdom

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Christian Carletti\*

*This paper examines the Austrian laws on privileges that affected Lombardo-Veneto Kingdom (1815-1859) and the reasons of the resistance against patenting in this region. The analysis in particular focuses on the role played by the local academies of agriculture and commerce and their endeavour to foster economic as well as scientific advancement. Through a comparison between the privileges issued in the Lombardo-Veneto and the industrial awards granted by the main local academies this work aims to show that the innovation activity of the academies provided an alternative, often successful, route to the patent system adopted by the Austrian government.*

### LÉGISLATION ET TRADITIONS LOCALES. ENTREPRENARIAT ET STRATÉGIES D'INNOVATION DANS LE ROYAUME LOMBARDO-VÉNITIEN

*Cet article examine la législation autrichienne autour des privilèges qui influenceront le royaume lombard-vénitien et les raisons de la résistance à l'activité de brevetation (d'élargir des brevets) dans cette région. Cette analyse se concentre, en particulier, sur le rôle joué par les chambres locales de l'agriculture et du commerce et évalue leur tentative pour promouvoir le développement économique et scientifique. À travers une comparaison entre les privilèges octroyés par le royaume lombard-vénitien et les prix industriels accordés par les principales académies, cette étude vise à démontrer que l'activité d'innovation des institutions locales proposa une voie alternative, souvent efficace, au système des brevets adoptés par le gouvernement autrichien.*

JEL Code: O34, N60

The aim of this paper is to compare two innovation strategies on which the growth of the Lombardo-Veneto Kingdom was built in the period between the Restoration (1815) and the Unification of Italy (1861). In these years when the kingdom was under Austrian domination, the entrepreneurial class of the region, which was to play a leading role in the future development of the Italian

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peninsula, was still in need of a system to promote innovation that would allow it to reach the level of the industrialized countries.

The most consolidated of the systems available to promote the initiatives of private businesses and companies had its roots in the eighteenth-century and was present throughout the territory thanks to the vast number of academies which dealt with the sciences, literature, the arts, agriculture and business. These institutions had the advantage of direct experience of local circumstances and were involved in the cultural, political and economic life of the region; consequently, they were able to support local entrepreneurs by offering them a wide array of services that ranged from legal consultancy to advice on the production and sale of their products. In addition, the academies extended their mission of interventions to stimulate and guide economic progress by providing assistance in the introduction and elaboration of new technologies and in the improvement of those already in place. For the entire period under examination, the most convincing strategies adopted by the academies for promoting commercial enterprise consisted in the publication of studies on the efficacy of inventions, assessments of the efficiency and potential economic development of machines and, finally, promotion of enterprise and innovation through industrial awards.

During the 1820s, the work of the academies was paralleled by the Austrian patent system – or privileges, as they were still called. Sustained as it was by legislation (which was refined in the following decades and promoted by the Austrian government, which aspired to enabling its regions to compete economically on an international level), this new system constituted an alternative to the existing system run by the academies. The Austrian government did not ban the tests conducted in the workshops of the academies; aligning its practices to the European market, it simply proposed that inventors pay a tax on their discoveries and inventions in exchange for legal protection and exclusive use of the product. At the same time, it aimed to loosen the control exerted by industry and tried to breathe new life and competitiveness into the race for innovation which was showing signs of flagging. All the same, in spite of these efforts, adherence to this new patent system was anything but prompt and the local entrepreneurs remained tied to established practices that had not lost their effectiveness.

## THE AUSTRIAN SYSTEM OF PRIVILEGES, 1820-1852

After the Restoration, the first legislative Act in Italy regarding privileges was the *Patente Sovrana sulla concessione di privilegi esclusivi...*, which was initiated by the government of Vienna in 1820.<sup>1</sup> This law, introduced in the Lombardo-Veneto Kingdom, as well as in all the provinces of the Austrian Empire, was inspired by the French patent system and it was meant to guarantee inventors' property rights on new discoveries, tools and machinery.<sup>2</sup> Although

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1. "Patente Sovrana 8 dicembre 1820 sulla concessione..." [1821]. On the Habsburg legislation on privileges, see: Ritter von Beck [1893]; Guazzo [1853] at the heading "privilege". For a contemporary perspective, see B. Dölemeyer [1999].

2. On privileges and patents during the Ancien Régime, see Hilaire-Pérez [2000] and MacLeod [1988]. For recent perspectives on modern and contemporary patent systems, see Hilaire-Pérez and Garçon [2004], Galvez-Behar [2008], Guagnini and Inkster [2002], Khan [2005].

many parts of the text of this first law were not always explicit on this point, it was clear that the inventor was entitled to consider himself to be the owner of the product which he had presented: in fact, he was allowed “to use the privilege itself, to pass it on to others by means of sale, licensing or any other method of transfer.”<sup>3</sup> As is well known, the recognition of a natural right of property traced a demarcation line between the *privilège* of the Old Regime, understood as a favour granted by the sovereign, and the modern *brevet d'invention*: in this sense an ‘exclusive privilege’ in the Austrian Empire really meant a patent; it differed from the old concept of a privilege, although the expression remained archaic.<sup>4</sup>

Apart from recognizing a property right for inventors, the 1820 law shows an initial attempt by the government to reduce its involvement in the assessment of the technological content of the specifications submitted. It was clearly stated that the government, by awarding a privilege without preliminary examination, did not intend to guarantee the success of the invention in any way. According to the text of this law, those who aspired to obtain a privilege for a discovery or invention had to present a sealed description to the local authorities –the *Capitano Circolare*. This description, which provided the details of the invention in question, had to comply with the usual criteria of clear explanation and forbear any attempt at concealment. It was also possible to add “designs or models” to the description, although it was explicitly stated that, “these will not be absolutely essential, if one is able with a single description [...] to adequately explain the object being dealt with.”<sup>5</sup> The author had to summarize the characteristics of the invention for which he required the privilege in a few lines on the envelope of the sealed parcel. The parcel had then to be sent to the Austrian government, and finally reached the Chamber of Commerce, in Vienna, which was the only body empowered to carry out an overall evaluation of the invention.

In 1832, the Austro-Hungarian government issued a new law on privileges which repealed the 1820 law.<sup>6</sup> On the whole, the text of this new law did not depart significantly from the previous one, but the process by which the privileges were awarded is of particular interest.

The role of the Chamber of Commerce of Vienna, formerly the body delegated to examine requests of privileges, was almost completely suppressed. The government was no longer concerned with inspections: indeed, it no longer even opened the sealed parcels; it limited its involvement to controlling the payments of taxes and the issue of the privilege on the basis of the short description on the

3. “[...] disporre anche del privilegio stesso, trasmetterlo ad altri mediante vendita, locazione, od altro qualunque siasi modo di alienazione.” (“Patente Sovrana 8 dicembre 1820 sulla concessione...”, p. 25.)

4. The concept of patents was not new in Italy, in fact under the Napoleonic occupation French legislation on the subject had been substantially extended to the Peninsula: the decrees issued in 1805 in the Duchy of Parma and Piacenza, in 1806 in the Kingdom of Italy and in 1810 in the Kingdom of the two Sicilies reiterated the French law of 1791; see Vasta and Dolza [1995], p. 102. For an overview of the Piedmontese system of privileges before the Italian unification, see Marchi, Vasta, Dolza [2002]. For a case-study on Italian patents in Lombardy after the unification, see Belfanti [2002].

5. “Si aggiungeranno alla descrizione, e per quanto si possa, o disegni, o modelli che rendano più intelligibile l’esposto; questi però non saranno assolutamente indispensabili, qualora si possa colla sola descrizione [...] far bastantemente conoscere l’oggetto di cui si tratta”. (“Patente Sovrana 8 dicembre 1820 sulla concessione...” [1821], p. 17.)

6. “Patente Sovrana 31 marzo 1832 portante la nuova legge...” [1832].

envelope. It was stated that “the government will not enter into the examination of the novelty or the usefulness of the invention, of the discovery or of the improvement, but will only acknowledge if the object in the appeal is by any chance considered pernicious or against the law.”<sup>7</sup>

The 1832 law virtually marked the end of any interest the Austrian government may have had in exerting control over the novelty and usefulness of inventions. The aim of the legislation was no longer to verify the effectiveness of the invention, but to protect the rights of the inventor to put his discovery to work. In fact, as well as granting the inventor temporary monopoly of his product, he was given permission “to found all the laboratories and employ all the workers he deemed necessary to be able to put the activity of his object (*sic*) to his greatest use, and to give it the [commercial] expansion he prefers in the widest possible way. He can found [...] factories and warehouses for the production and the sale of the privileged object, authorise others to put in practice his discovery under the protection of the privilege itself, and to employ partners to further any increase of its use and its application [...]”<sup>8</sup>

Besides safeguarding the rights of the individual inventor, the government also aimed to boost competition, and so the law provided that, if the inventor let pass an entire year from the day the privilege was granted without putting into practice or improving his discovery or invention, he would lose these rights.<sup>9</sup> This prevented the privileges from restricting the initiative of other entrepreneurs who had sufficient capital available to start up the same activity, but, above all, it re-ignited the interest of the Empire’s inventors. In fact, after a decade in which the privileges steadily decreased in number, from 1832 they started to increase (see figure 1).

The last law on privileges to affect the Lombardo-Veneto Kingdom during the period of Austrian domination was issued in 1852, following the political crisis of 1848 which had seriously damaged the Empire’s economy and commercial policies.<sup>10</sup> It was more complex and extensive than the previous laws, with innovative and interesting features which concerned the effectiveness and the functionality of the system.

The first of these features was the institution of the Imperial Royal Archive of Privileges with headquarters in Vienna. The Archive’s task was to look after all the complete descriptions, to maintain updated registers of names and subjects, and to keep a main register, compiled in compliance with strict criteria. In this main register were listed, “all the privileges granted up to the day the law was issued, the date of the award, the name and place of residence of those who

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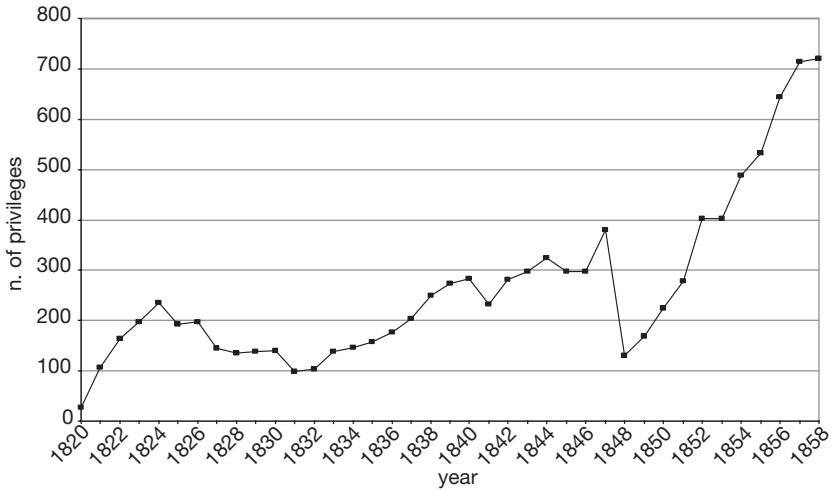
7. “Il Governo non entrerà punto in esame circa la novità o l’utilità dell’invenzione, della scoperta o del miglioramento, ma soltanto riconoscerà se l’oggetto nel ricorso indicato sia per avventura sotto qualunque pubblica vista pernicioso o contrario alle leggi”. (*Ibid.*, p. 103.) In this Austrian government moved closer to the English system, which had no examination for novelty until 1905, and never one for utility.

8. “Il privilegiato è autorizzato ad erigere tutti i laboratori, ed a prendere tutti gli operaj che crede necessarj e a porre nella maggiore attività l’oggetto del suo privilegio, ed a darvi l’estensione che gli aggrada nella più ampia maniera. Egli può quindi erigere [...] stabilimenti e magazzini per la fabbrica e lo smercio dell’oggetto privilegiato, autorizzare altre persone a porre in pratica il suo ritrovamento all’ombra del privilegio medesimo; assumere socj a suo talento per portarne a qualunque grado d’incremento l’uso e l’applicazione.” (“Patente Sovrana 31 marzo 1832...”, p. 104-105.)

9. *Ibid.*, p. 109.

10. “Patente Imperiale 15 agosto 1852 con sui si emana una nuova legge...” [1852].

Figure 1. Privileges issued in the Austrian Empire 1820-1858



Data Source: Paul Ritter von Beck, *Das Oesterreichische Patentrecht*, Berlin, Carl Heymanns Verlag, 1893. For a comparison with the number of patents issued in the same period in England, see H. I. Dutton [1984].

obtained a privilege, or the person representing him [...], the date of application, the secrecy request (if applied), all the circumstances regarding the practice, the transfer, the delay or the termination of the privilege, and finally the number of the file in which the description is kept, as well as any further documents relating to the privilege itself.”<sup>11</sup> Moreover, the Archive was obliged to compile a monthly report updating the state of the privileges, any extension or change of ownership, and the suspension of their validity. This report was then forwarded to the Minister of Trade and Industry, who ordered its publication and sent a copy to every province in the Empire.

The second important feature of the 1852 law was the renewed focus on the descriptions supplied by the applicants. The rule which forbade, before assigning the privilege, “any sort of investigation on the novelty or usefulness of the discovery or invention” was still valid,<sup>12</sup> but it was illegal to hide anything both in the means and their application, as well as to indicate means which would cost more or would not produce the same effects.<sup>13</sup> The law of 1852, by requiring greater accuracy in the description of the patented inventions, attempted to remedy a system which had been seen to be fallible. The objective of the legislator was very clear: he intended that, “when the privilege is published –after

11. “[...] tutti i privilegi stati conferiti dal giorno in cui entrerà in vigore la Legge [...], la data del conferimento, il nome ed il domicilio di chi ottenne il privilegio, o di chi rappresenta quest’ultimo [...], la data del privilegio, l’eventuale domanda del segreto, tutte le circostanze riguardanti l’esercizio, il trasferimento, il prolungamento o l’estinzione del privilegio e finalmente il numero del fascicolo nel quale si custodiscono la descrizione e gli altri allegati della rispettiva istanza, non che i successivi documenti che hanno relazione col privilegio.” (*Ibid.*, p. 968.)

12. “Prima della concessione del privilegio non si fa mai luogo ad investigazione di sorta sulla novità od utilità della scoperta.” (*Ibid.*, p. 949.)

13. *Ibid.*, p. 947.

expiry— it is possible for any craftsman to reproduce it.”<sup>14</sup> The law emphasized the fact that the description had to be clear and intelligible, with particular attention to the methods used;<sup>15</sup> above all, it had to be prepared in such a way as to provide experts with adequate explanations for the reproduction of the invention in question.

The reproducibility of an invention became fundamentally important during this period: the establishment of the Archive of Privileges and the attempt to enforce realistic and detailed descriptions were the result of the fast growing need to protect not only the rights of the inventor but also of the craftsmen and traders who, once the privilege’s maximum term of fifteen years came to an end, could make free use of the invention. It is in this context that the Archive of Privileges became the delegated body to provide concrete assistance to the public: an office where one went to get information on certain files or to know the limits of a privilege, but also to compare one’s own inventions with those of other inventors. According to the law of 1852, “anybody is free to ask the Archive of Privileges for written or spoken clarifications regarding awarded privileges and also if necessary to inspect the register in person.”<sup>16</sup> As a result, anyone could ask to see the descriptions of privileges that were no longer valid and make a copy of them.

## ACADEMIES AND INDUSTRIAL COMPETITIONS

Before comparing the patent system and its effectiveness to the system promoted by the local academies, it will be useful to briefly analyze the case of Bartolomeo Avesani, a mechanical engineer active in the Lombardo-Veneto, who preferred doing his business without compromising with the new opportunities introduced by the Austrian government. Born in Verona, Avesani completed his studies at the local school, where he received a scientific, but not specifically technical, training. His obituary indicates that in spite of his good results at school, he was drawn to mechanical engineering: however, he did so without undertaking any formal education; in fact, he lacked any study of statics, dynamics or geometry.<sup>17</sup> He therefore started his career as a draughtsman in the offices of local craftsmen.

Avesani produced his first invention in 1812: a machine for working silk, which made it possible to carry out three operations (threading, doubling and twisting) simultaneously, which until then had been carried out separately. As soon as his machine was ready, he presented it to one of the local academies of

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14. “[...] in modo tale che, quando essa [the description] vien portata a pubblica notizia dopo la scadenza del privilegio, sia possibile ad ogni uomo dell’arte di riprodurla.” (*Ibid.*, p. 945.) In adopting these measures the Austrian government was clearly taking into account positions that had been the primary criterion of the specification at English law since the 1770s.

15. *Ibid.*, p. 947, § 12 G.

16. “È libero a chiunque di chiedere all’Archivio dei privileghe schiarimenti a voce od in iscritto riguardo ai privileghe concessi, e anche d’ispezionare a tal uopo in persona il registro.” (*Ibid.*, p. 953.)

17. See Radice [1846], p. 290. On Bartolomeo Avesani’s biography, see also: ms. “Avesani Bartolommeo”, Verona Civic Library, Autografoteca Scolari, 258; ms. “Avesani Ingegnere Bartolommeo”, Academy of Agriculture, Science and Literature of Verona, Libro dei Meriti.



the region, the Academy of Agriculture, Commerce and Arts of Verona. Avesani's machine was tested for the first time at the Academy. Having issued a positive judgment, the Academy proposed that the inventor should participate in the competition for industrial prizes held in Milan (the capital), at the Imperial Royal Lombard Institute, which was the most important Academy of Science, Literature and Arts in the Kingdom. In 1813, following this suggestion, Avesani sent a reduced scale model of his textile machine to Milan. According to the report of the examining commission, it would reduce working times and, for this reason, it was awarded a silver medal.<sup>18</sup> However, while judging the model positively, the examining committee expressed reservations as to the real operational efficiency of the machine itself, since this could only be verified by testing its functioning and potential savings when running it in normal working conditions.<sup>19</sup> In the following years, Avesani continued to work on the same machine and, in 1816, his name was entered in the list of persons registered for the national prize competition for industrial awards held in Venice, at the Imperial Royal Venetian Institute of Science, Literature and Arts. This time he presented a full-scale prototype for testing and the machine met the standards for originality and efficiency required by the Institute *in toto*: the committee therefore encouraged the use of the machine, and Avesani was awarded the gold medal.<sup>20</sup>

After these first results, Avesani's successes at annual competitions for industrial prizes multiplied. In 1817, he was awarded three silver medals for the invention of a new spindle (for spinning machinery), a machine for working steel wire and another, for manufacturing screws. In 1819, he presented a brass sleeve that would generally be used in fire-fighting pumps and was awarded a silver medal. Between 1820 and 1830, his activity expanded: he won prizes for several new hoists, a device for moving earth or water over long distances, a machine for making toothed gears, and other devices. Yet, throughout, Avesani always worked in connection with the academies, and with complete disregard for the new opportunities introduced by the Austrian legislation on privileges.

As Avesani's activities grew, the industrial prize competitions became a form of trade fair, where he could present his inventions and where he gained recognition and fame, which fed new requests from his clients. In his workshop, which he improved over time, Avesani began to receive orders not just from private enterprises but also from public bodies. He reached the apex of his career in 1830, when he turned again to the local Academy in Verona to examine a steam engine he had invented.<sup>21</sup> This was built along traditional lines, it could develop a force of about three horse-power and its originality lay in a system of valves through which Avesani sought to reduce the risks of explosion. It was not exactly a state-of-the-art device if compared with other steam engines circulating in Europe in the same period, but it is not the technical details I want to focus on here, but the process by which Avesani expanded his activity as an inventor and entrepreneur.

18. Prefetto dell'Adige, 18 Agosto 1813, n. 24449, Verona State Archive, Prefettura del Dipartimento dell'Adige, folder 36.

19. Radice [1846], p. 292-293.

20. "Bartolomeo Avesani," in *Collezione degli atti...* [1824], p. 98.

21. "Bartolomeo Avesani", 21 May 1830, Archive of the Academy of Agriculture, Science and Literature of Verona.



There were two crucial moments. The first was the examination and testing of the invention. When Avesani presented his steam engine, the Academy nominated a committee of experts and subjected the machine to a minute analysis: first of all, they looked at the quality of the materials with which it was constructed, and then they filled the boiler and measured its volume (200 litres of water); after lighting the boiler, they filled the firebox with wood (6 kilos) and timed how long it took to bring the water to the boil (35 minutes).<sup>22</sup> When they had established the work power generated and the provision of energy, they considered the air circulation and combustion systems, and finally the safety system guaranteed by the mechanical valves.

The second crucial moment for an ambitious inventor was receiving the Academy's recognition. In this case, the results were judged positively, so the inventor was awarded a medal. In addition, the report on the design of the machine and the analysis of its performance were ordered to be published in the Academy's journal. A few months after the publication of the description, Avesani received some orders. For example, there is a draft contract from a "Milan Boat Company" for Avesani to build a steam engine to be used in a boat for navigation on Lake Garda. The text clearly indicates all the technical requirements: the Company refers explicitly to the description given in the Academy's papers, asking for a steam machine that used the method of construction described in the papers published by the Academy of Verona.<sup>23</sup>

I have gone into greater depth on Avesani's case because his experience, which was similar to that of the majority of the inventors of the Lombardo-Veneto region, throws light on a system that was rooted in an agricultural economy with strong local characteristics. The academies, which dominated the cultural and economic life of the Lombardo-Veneto, provided practical help to farmers, craftsmen and merchants with bureaucratic and legal problems and, at the same time, acted as a sounding board for the needs progressively voiced by the local working community. As we have shown in this case, the academies regularly examined machines for agriculture and industry, using committees of experts, chosen mainly among the members of the institute. The experts analysed the discovery and compiled a report, with particular attention to its efficiency and its potential usage. In the case of Avesani, for example, a boat-building company heard about his expertise through a publication in the journal of the Academy of Verona. On the one hand, this proves how important it was for Avesani to publicise his work and have it accredited through an academy and, on the other, it demonstrates that the papers and records published by the academies circulated widely, not only among researchers and technicians but also among entrepreneurs.

Moreover, it should be remarked that the examination carried out by commissions effected the transition from a pragmatic knowledge of an object to a formal description which identified the content of novelty and the usefulness of the invention. This qualitative leap from manual ability to systematic and formal knowledge took place in the "competitions for industrial awards."

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22. Zamboni *et al.* [1831], p. 6.

23. Ms. "Lettera dalla Privilegiata Società di Battelli a Vapore in Milano", Verona Civic Library, Autografoteca Scolari, 258, n.d.

Standard procedure since the days of the Venetian Republic, the competitions also proved useful for the promotion of development in the agricultural sector, and the role of mediation carried out by the local institutions was still important at the turn of the nineteenth-century. However, under the French domination a first attempt was made to promote centralization: in 1805, it was declared that “on 15<sup>th</sup> August of every year, prizes were awarded to those Italian subjects who had made important discoveries for agriculture and the mechanical arts, or had invented, perfected or transferred into the Kingdom new branches of industry and new sources of prosperity. The prizes consisted of laurel crowns and gold and silver medals, one side of which bore an inscription that commemorated the object for which it was awarded and the name of the prize winner; the crowns and the medals were distributed by the Home Office in the presence of the Ministers and all the national and local authorities gathered in Milan, and all the members of the National Institute.”<sup>24</sup>

Thus the competitions continued to be an effective incentive for entrepreneurship, but they were transformed into events of elevated status staged in the region’s capital. Through the presentation in Milan of laurel crowns and medals in the presence of all the Ministers, the French government intended to manifest its own concern with the state of the economy and to gratify those citizens whose genius and initiative contributed to the development of agriculture, manufacture and commerce.

The distribution of industry awards was continued until 1814 when it was interrupted by war. The following year, Francis I formed the Lombardo-Veneto Kingdom, entrusting the governments of Milan and Venice with its administrative management, and in 1816 the competitions were held again. As a result of two decrees passed in 1817 and 1818 respectively, the presentation of the awards was to take place, in alternate years, in Milan and Venice. The prizes still consisted of gold and silver medals and “honourable distinctions”. Candidates had to present their application to the local royal delegation, enclosing an essay describing the invention, improvement or introduction, or drawings that made them sufficiently intelligible. By the first day of August, each provincial delegation had to nominate a commission of five experts chosen amongst the professors of physics, natural history or technology and among the members of the agricultural and arts societies of the province, to examine the discoveries or the introductions that had been submitted and to give their judgement. If an object could not be presented because, for example, of its dimensions, the commission had to examine it *in situ* and then issue a report, or nominate others to do so. Once all the inventions had been examined, the reports were to be sent to the Imperial Royal Institute of Science, Literature and Arts for the final verdict. The results were then published and the models exhibited to the public for ten days in the rooms where the prizes were awarded.

24. “che nel giorno 15 del mese di agosto di ciascun anno avvenire si sarebbero distribuiti dei premj a quei sudditi italiani che avessero fatte utili scoperte nell’agricoltura e nelle arti meccaniche, o che avessero inventati, perfezionati o trasportati nel Regno nuovi rami d’industria, nuove sorgenti di prosperità; che i premi consisterebbero in corone d’alloro ed in medaglie d’oro ed argento, sulle quali sarebbe impressa da una parte un’iscrizione che ricordasse l’oggetto che avesse ottenuto il premio ed il nome del premiato; che le corone e le medaglie sarebbero distribuite dal Ministro dell’Interno alla presenza di tutti i Ministri e di tutte le autorità nazionali e locali che si trovassero unite in Milano, e di tutti i membri dell’Istituto nazionale”. (“Avviso preliminare,” in *Collezione degli Atti...* [1826], p. 109.)

## PRIVILEGES VERSUS INDUSTRIAL AWARDS

The aim of the short survey on privileges was to highlight the principles that inspired the legislation. In particular, the choice of a progressive relaxation of the control mechanisms on the usefulness of new discoveries, and subsequently the protection of the right to use expired privileges, clearly indicate the government's determination to avail itself of the competitive nature of an increasingly open market. It is still questionable whether this system was capable of facing the resistance engendered by the loyalty to consolidated innovation models tailored to a particular economic and institutional context such as, for example, the Lombardo-Veneto Kingdom. If examined in detail, the response is negative: in this region, in fact, several factors hindered the diffusion of privileges.

In 1854, in its entry for "statistics," the *Nuovo dizionario universale tecnologico* documented the spread of patents, giving a comprehensive description of the situation in the Lombardo-Veneto Kingdom.<sup>25</sup> The French patents for the year 1852 were itemized, one by one, and they numbered about six times as many as those obtained in the same year in the Austrian Empire. These data, wrote the authors of the "statistics" entry, offered a clear picture that indicated the backwardness of Austria compared with France. However, they said, there was a renewal of industry which was raising the level of economic progress in the Lombardo-Veneto Kingdom. The statistical problem, they wrote, was that the activity of many Italian inventors could not be measured through the records of a patent system; this was mainly due "to the modesty, negligence or ignorance of the inventors."<sup>26</sup> According to one commentator, the inventors of the Lombardo-Veneto Kingdom "pay no attention to a system of privileges whose importance they have not learned to appreciate; consequently, they prefer the annual medals released by the two scientific Institutes of Science, Literature and Arts in Milan and Venice, and only aspire to that recognition."<sup>27</sup>

The data illustrated in figure 2 confirm the thesis and provide evidence of this trend in the years from 1822 to 1845. The erratic and apparently unstable trend of the industrial awards granted by the academies is to be attributed to the fact that, as previously mentioned, the awards competition organized by the Imperial Royal Institute of Science, Literature and Arts was held in alternate years, in Milan and Venice. The peaks correspond to the years in which the competition was held in Milan, testifying to the greater entrepreneurial vivacity of the Lombard capital with respect to Venice (the interruption of the line in 1836 is because no industrial awards were held that year; in 1837 the competition was held in Milan and then again alternately in the two cities until 1845).

It is worthy of note that the gap between the two systems would have been much greater had all the inventions presented to the Imperial Royal Institute for industrial awards been included in the statistics, and not only those which actually received awards. Moreover, the chart of the industrial awards represents only the activity of the Imperial Royal Institute of Science, Literature and Arts (both the Milanese and Venetian branches) but not the entire region: it does not include award-winning discoveries or inventions presented at the provincial

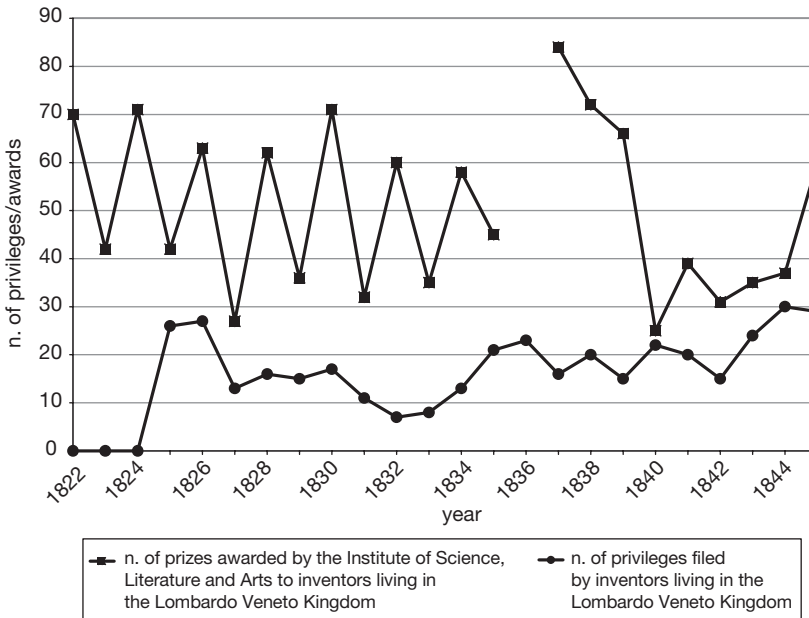
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25. "Statistica delle invenzioni," in Lenomand *et al.* [1854], p. 7-373.

26. *Ibid.*, p. 345.

27. *Ivi.*

Figure 2. Comparison between privileges issued in the Lombardo-Veneto and industrial awards granted by the Imperial Royal Institute of Science, Literature and Arts, 1822-1845



Data Source: *Raccolta degli atti dei governi di Milano e di Venezia*, Milan, Regia Stamperia, 1815-1849; *Collezione degli Atti delle solenni distribuzioni de' premj d'industria*, Milan, Regia Stamperia, 1824-1857.

academies. Despite the exclusion of this data, it is clear from figure 2 that the academy system continued to be predominant. During the period examined here, the number of inventors who preferred the industrial awards was always greater than those who chose to use the Austrian system of privileges.

There is no novelty in remarking that there was considerable inventive activity independent of the patent system.<sup>28</sup> However, what is certainly worthy of note in the present case is the rupture between two parallel systems, as it concerns the technical-practical approach to innovation. In the academies' system, the commission entrusted with the testing of an invention had to evaluate the originality of the machine from a general point of view, paying attention to its efficiency and its capacity to improve existing technologies. Moreover, the reports written following such an examination of a machine described the quality of the materials used, focused on the technical details of its functions, presented measurements of fuel consumption and assessed its capacity to produce substantial savings, its durability, and so on. The presence of the machine itself was therefore an essential condition for the preparation of an assessment: it was necessary to see the machine, try it out, and test its usefulness before suggesting whether it should be put on the market.

This competition system comprised an approach founded upon control procedures and, therefore, was substantially the opposite of the liberal model promoted

28. MacLeod [1988], p. 97.

by the laws on privileges. Indeed, the Austrian legislation on privileges included no such procedures: inventions were not tested and, at most, the inventor supplied drawings that (on request) would be kept confidential for the duration of the privilege. Therefore, from the inventor's point of view, the procedure enshrined in the system of privileges was less demanding than that adopted by the academies, because it did not require verification. Moreover, it was also more advantageous to the inventor in other ways: it was not expensive, it protected property rights and it granted the inventor exclusive use of the privileged machines. Despite this, the majority of inventors living in the Lombardo-Veneto preferred not to comply with the system of privileges; they showed no concern for the confidentiality of their inventions, and chose to develop their careers according to the more complex, traditional tracks fostered and kept alive by the academies.

At present, it would be hazardous to draw further conclusions, given the lack of complete data on the application sectors, the training of the inventors, the osmosis between the two systems and the developments that took place in the second half of the century. However, it is reasonable to deduce that one of the factors that hindered the acceptance of the system of privileges regards the level of the economic structure of the region.

Despite being the richest area of the peninsula during the central decades of the nineteenth-century, the Lombardo-Veneto Kingdom was still dominated by a pre-industrial economy almost totally based on the processing of silk and wool and almost completely innocent of any new energy source, of the massive use of iron, or the large-scale mechanization processes which were taking place in other European countries. The reasons for this delay in industrialization, especially when compared with the British model, have been traced to social factors including the elevated illiteracy rate and the low *per capita* income but, most of all, to the lack of coal and, consequently, of steam-powered machines.<sup>29</sup> From the point of view of this study, it is interesting to observe that the aim of the laws on privileges to favour independent entrepreneurship was exclusively focused on factory labour, and with this being constantly in competition for new technical resources, it turned out to be inadequate. In fact, in an area in which industry grew in symbiosis with the needs of a rural, domestic economy and in a context in which manufacture was solidly linked to agriculture rather than to industry, any attempt to regulate competition between factory owners would have been, to say the least, inappropriate.

If, on the one hand, it is reasonable to assume that the structure of the local industries, the level of efficiency reached and the nature of the various sectors involved all played a significant role in determining adhesion to the privilege system,<sup>30</sup> on the other, the controversial relationship between inventors and the academies must also be taken into consideration. Writing on eighteenth-century technical inventions in France, Liliane Hilaire-Pérez emphasizes the increasing climate of conflict between "*académisme*" and the know-how of the craftsmen. The collaboration that was founded on the ideal of science at the service of the community broke down when the *Académie* rose in defense of an official science

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29. On the northern Italian economy before the Unification, see Cafagna, Crepax [2001], Pichler [1996]; Porta, Scazzieri [2002].

30. MacLeod [1988], p. 97-114.

which was threatened by specialized technicians and inventors, who often came from unorthodox forms of training, related to new disciplines. This was the case in France, at the end of the eighteenth century, when the fame and competences of certain inventors became sufficient in themselves to guarantee the validity of their inventions.<sup>31</sup>

In the Lombardo-Veneto region, the almost total lack of schools of engineering and applied industry at international level kept the quality of the inventions fairly modest and did not provide an adequate basis for producing inventors capable of competing with the learning provided by the academies.<sup>32</sup> This may have been the principal reason that the academies continued to predominate over the privilege system, and not only the philanthropic spirit that inspired their work or the efficacy of the knowledge that they were able to contribute to innovation.

For most of the nineteenth-century, the Imperial Royal Institute of Science, Literature and Arts, but also the new institutes that had sprung up in emulation of it, such as the *Società d'Incoraggiamento d'Arti e Mestieri* (Society for the Encouragement of the Arts and Crafts), founded in Milan in 1841, were both the reference point for acquiring knowledge and, above all, a “showcase”. By gaining admission to the community that attended the events organized by the academies, inventors obtained access to a social network whose members were in a position to provide not only scientific knowledge and technical/practical know-how but also commercial intelligence; what they sought was information on economic dynamics and the market, the possibility of launching commercial associations and assistance in securing financial support.

Seen in this light, the annual assignment of the industrial awards appears like a formal recognition, ceremonially celebrated, of the admission of an inventor to an élite network (or his confirmation in that position). The academies' model of industrial awards can, therefore, be better understood if, together with its economic efficacy, it is considered as a ritual event which protects the authority of a development model integrated into society. The system of privileges, on the other hand, which abandoned the inventor to the mercy of free enterprise, leaving him alone to deal with the vagaries of the market, seemed to academicians and inventors alike to be far too risky and possibly even ethically flawed.

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31. Hilaire-Pérez [2000], p. 160-169.

32. On engineering in Italy see: Bigatti, Canella [2008]; Cantoni, Ferraresi [2007]; Giuntini, Minesso [1999].



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