

ACCOUNTING FOR CREATIVITY: LESSONS FROM THE ECONOMIC HISTORY OF INTELLECTUAL PROPERTY AND INNOVATION

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ABSTRACT. Social progress depends on the realization of inventive ideas, and economic history provides valuable lessons about creativity in technology and culture. The empirical study of over one hundred thousand innovative individuals who obtained patents, copyrights, and prizes, sheds light on the relationship between institutions, incentives, and transformative ideas and expression, over the past two centuries. The European growth model assumed useful knowledge was scarce, and top-down administered innovation systems offered rights and rewards to “exclusive” groups. By contrast, American policies regarded creativity as widely distributed in the general population, and further promoted “inclusive” market-oriented mechanisms that fostered diversity in ideas and outcomes. The evidence suggests that property rights in patents facilitated markets in ideas, and ensured that returns were aligned with productivity and market demand. Whereas, such administered systems as innovation prizes and publisher’s copyrights in the “creative industries” benefited the few rather than overall social welfare.

1. ECONOMICS AND CREATIVITY

For many, creativity is an ineffable expression of the human condition, well beyond conventional economic concerns. “Creative output” often excludes large areas of standard economic activities from consideration. Creative writing is defined in terms of novels and fictional literature rather than a novel theoretical article in the *Journal of Economic Literature*. The boundaries of creative industries officially include music, fiction, fashion and design, architecture, performance, computer games, photography and film, and other “artistic” pursuits.¹ The genius “creates” a painting of a can of soup or “curates” the placement of a urinal; whereas the producer of a superior can of soup or the plumbing in

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¹See, for the instance, UNCTAD’s definition of creative industries which can be found at <https://unctad.org/en/Pages/DITC/CreativeEconomy/Creative-Economy-Programme.aspx>. The 2008 Creative Economy Report (p. 3) is more comprehensive, regarding creativity as “the formulation of new ideas” and “originality, imagination, inspiration, ingenuity and inventiveness” especially when applied to cultural goods, inventions and innovations.

question has no place in such an accounting of creativity.² Similarly, on the demand side, consumers of the painting are assumed to derive “emotional dividends,” that are somehow different from the utility of consuming the can of soup (Lovo and Spaenjers 2018).

Demsetz (2009) refers to the “neglect of creativity by economists,” but this assertion needs to be qualified. It is certainly true that economists have generally not subscribed to the essentialist approach that regards genius and creativity in terms of personal or psychological traits bordering on the divine. Instead, specialists in sociology, philosophy, and psychology seem better equipped to explore notions like “ideational fluency” in “affective temperaments.”³ Rather than trying to specify what creativity is, economists have fruitfully and creatively investigated what creativity does, and the systematic factors that influence the orientation of useful ideas and expression. Creative behaviour is involved in productivity, innovation and other standard economic concepts. Rubenson and Runco (1992) considered creativity as a form of human capital, part of which owed to exogenous initial endowments, and part to investments that added to the potential for creative output. Creative expression has been addressed by members of SERCI and numerous cultural economists (Ginsburg and Throsby 2006, Caves 2000, Menger 2014, Towse 2011).

The standard neoclassical growth models assume that economic growth is a function of exogenous or inelastic supply factors. In recent years, economic theorists have integrated more explicit considerations of creativity in endogenous growth models (Romer 1993). The most extensive empirical studies support the notion of endogenous creativity, by examining variation in incentives for scientific and technological creativity in individuals and among groups.⁴ Legal and other institutional rules constitute important incentive mechanisms, whose design shapes the rate and direction of all human behaviour, including innovation and ingenuity. Khan (1996, 2008) elaborated on the specific ways in which laws and legal

²The references are, of course, to Marcel Duchamp’s *Fountain*, which introduced the school of conceptual art (Banz 2020); and Andy Warhol’s canonical series of prints featuring Campbell’s soup cans.

³*The Journal of Creative Behavior*, for instance, includes very few articles on or by economists. A keyword search for economics in the journal’s recent index produces one hit: an article on creativity in home economics. Several studies attribute creativity to mental pathologies, and even “nonright-handedness” (Preti and Vellante 2007).

⁴For instance, Azoulay et al. (2011) found that the incentives vested in different types of research funding contracts influenced the development of important new ideas; and Erat and Gneezy (2016) explore gender differences. Pack (1994) pointed to the need for further empirical investigations of endogenous growth theories.

institutions affected technological creativity, and demonstrated how reforms in Married Women's Property Rights statutes induced women to engage in higher inventive activity.

As Weitzman (1996) pointed out, insights from economic history are a prerequisite for understanding the empirical relationship between growth and transformative ideas. A significant coterie of economic historians subscribe to an essentialist orientation that associates creativity with unique geniuses, "upper tail knowledge," and the contributions of a small minority of the population. A unifying theme is that creative ideas are in scarce supply, or even exogenous "gifts of Athena." For example, Galenson (2010) declared, as if it were self-evident, that creativity "is largely the domain of extraordinary individuals or small groups." According to Mokyr (2002), the modern knowledge economy originated in the foment of ideas among a small group of thinkers responsible for the European "industrial enlightenment." Elites, and institutions restricted to elites, generated a rich network of cumulative creativity that spilled over to benefit the untutored masses and so promoted modern economic growth. The alleged scarcity of genius and original insights points to the crucial role of great men ("cultural entrepreneurs") and great inventions ("macroinventions"), inspired by a small select group of (almost exclusively male) intellectuals.

European nations indeed tended to regard knowledge and creativity in technology and culture as scarce and specific to special classes. Oliver Goldsmith scathingly observed in 1834 that "the Republic of Letters, is a very common expression among the Europeans and yet, when applied to the learned of Europe, is the most absurd that can be imagined, since nothing is more unlike a republic than the society which goes by that name." European knowledge-elites despised insights gained from practical pursuits and untutored experimentation, and depreciated the tastes of masses. The British Royal Society publicly lauded the concept of "useful knowledge," even while their members privately disparaged "mechanical and capricious persons." The various salons and influential patrons functioned as the gatekeepers of accepted culture in science and the arts. According to such exclusive groups, "the mysteries of the universe were beyond the capacities of the vulgar" (Eamon 2006).

This essay discusses my own contributions to the literature on creativity and endogenous growth, as summarized in *The Democratization of Invention* (2005) and *Inventing Ideas* (2020). Together, this body of research provides a microfoundation for understanding differential growth paths, drawing on the experience of over one hundred thousand innovative individuals who obtained patents, copyrights, and prizes in the major industrial countries. The results suggest that the economic analysis of creative ideas and expression is best understood by means of a comparative institutional approach. Assumptions about the nature of creativity affected the design of institutions and mechanisms to promote social and technological progress. These institutional differences can be viewed in terms of a spectrum, with decentralized markets at one end and mediated “administered innovation systems” at the other. Administered systems consist of arrangements where decisions about economic values, rewards and the allocation of resources are made by the state, administrators or select panels.

How did the undistinguished American republic surge ahead to become renowned throughout the world for its technological creativity and cultural ingenuity? The American growth model was based on a different conception about social goals and the sources of creativity than had previously existed, and these assumptions were vested in its policies. In keeping with endogenous growth models, U.S. institutions held that both the scale and diversity of useful ideas in this population of potential innovators critically mattered. Markets in ideas and expression incentivized all creative members of society, including ordinary artisans, women, children – and even economists. The “great and the good” in technology and culture would be identified by success in meeting market demand, rather than by privileged coteries. Rapid growth was promoted by open access-institutions, decentralized markets in ideas, and rewards that were aligned with productivity and consumer satisfaction.

The European growth model was dominated by top-down administered innovation systems that offered inducements and rewards for the favoured few. By contrast, American innovation policies regarded creativity as widely distributed in the population, and promoted market-oriented processes. Institutions that assumed creativity was scarce and required “the habit of deference to great men” had very different consequences relative to

open-access institutions that offered incentives to everyone in the population. Indeed, the economic history of Britain, France and the United States shows how these institutional differences accumulated and significantly influenced comparative advantage at the level of both individuals and national.⁵

2. PATENTS, CREATIVITY AND THE MUNDANE GENIUS

Intellectual property institutions influenced the course of industrialization and international competitiveness. However, “intellectual property” bundles together copyrights, utility and design patents, prizes, trade secrets and other mechanisms that have vastly different motivations, rules, and implications for technology and culture. This article therefore separately identifies the lessons from the economic history of patents and great inventors, innovation prizes, copyright and the creative industries. The implications for inclusiveness and diversity are discussed in terms of gender differences.

The distinction between markets and administered systems parallels two fundamental economic models regarding the nature of genius and creativity. Economic growth, it is often claimed, depends on technological disruption, in the form of discrete “great inventions” or “general purpose technologies” like electricity, the railroad, and the steam engine, that dramatically transform economy and society. The corresponding elitist approach highlights the upper tails of the distribution of knowledge and human capital, supposing that geniuses are necessarily few in number, and they possess scarce human capital or innate abilities that are beyond the reach of the majority in the population. If genius is exogenous, a *machina ex deo*, this implies that excellence cannot be induced, only recognized and rewarded by equally discerning panels.⁶ The market-oriented democratic approach

⁵This paper summarizes my previous research based on the extensive empirical analysis of creativity in social and economic progress. Together, these results are based on the detailed assessment at the individual level of over 150,000 authors, inventors and innovations in Britain, France and the United States, between 1750 and 1930, as well as hundreds of thousands of book titles, copyright filings, and other cultural output. These data allow us to comprehensively analyze at a microscopic level how different sorts of incentives and institutions affect technological and cultural creativity in both society and economy. In particular, see *The Democratization of Invention* (2005) and *Inventing Ideas* (2020).

⁶According to Mokyr (1990, 2002) great inventions are “gifts of Athena” that result from “strokes of genius, luck, or serendipity.”

holds that the supply of creativity is not scarce: the majority of the population is capable of exceptional achievements, and the rate and direction of their efforts respond to appropriate incentives and institutions.

Thomas Alva Edison is justly celebrated as one of the most creative inventors in American history, and his contributions helped to transform the world of consumption and production. His patented improvements spanned a range of new industries, from incandescent light bulbs to movies, automobiles and even aircraft. An aggressive entrepreneur, his companies were party to over 11 percent of the lawsuits litigated by great inventors in his lifetime. Unlike the usual trope of the brilliant young genius, he was a productive inventor for much of his life, and his most influential inventions were created after he was fifty years of age. Edison lacked formal schooling, and any science and mathematics input into his creativity was due to his employees. His methods were based on meticulous experimentation, and he famously declared that “genius is hard work, stick-to-it-iveness, and common sense.” In other words, “genius” owed to habits that could be acquired by most in the population.

How typical was Edison of other “great inventors,” and what distinguished these acknowledged inventive geniuses from their less eminent peers? We can gain useful insights about their creativity from the technological output and biographies of over 800 “great inventors” from the United States and Britain who were active in the nineteenth and twentieth centuries.⁷ Rather than randomly-distributed factors associated with serendipitous genius, what stands out are the systematic observed patterns, and the degree of their market-orientation. Great inventions were derived from long-term committed investments in inventive creativity that successfully met salient needs in the market. The results for

⁷Khan and Sokoloff (1993, 2001) and Khan (2014, 2020). The sample was drawn from prominent national and specialized biographical dictionaries. Besides inclusion in these sources, other metrics were constructed to ensure that the results were representative. First, inventor citations provided an index of technically valuable inventions during the inventors’ lifetime, whereas patent citations gauged the technical relevance of great inventors’ patents to the modern period. Taken together, these measures allow us to follow Galton’s 1869 definition of genius in terms of “the opinion of contemporaries, revised by posterity.” Second, the relative importance of inventors in biographical dictionaries was measured in terms of space allotted to each entry. Third, assignments of patent rights provided an index of commercial value. Logistic regressions estimated whether systematic factors influenced the likelihood of inclusion in these sources.

the American great inventors are especially striking, for they indicate how similar their backgrounds and patterns of inventive activity were to those of ordinary patentees.

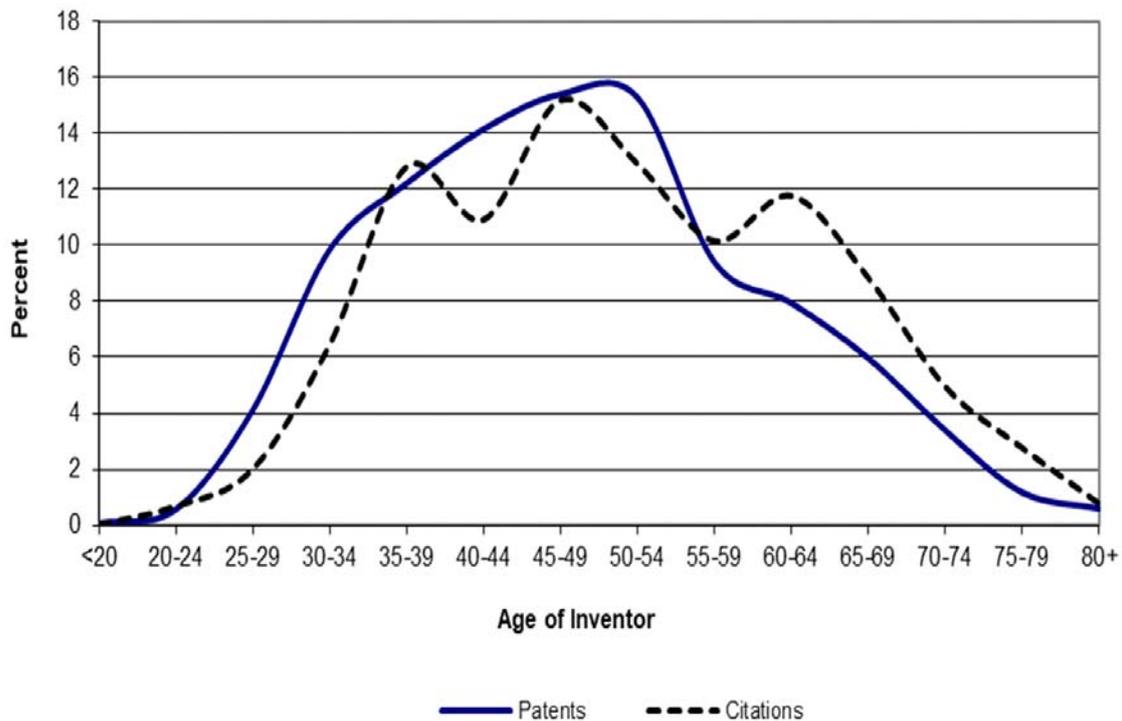


FIGURE 1. Age and Great American Inventions: Patenting and Citations

Notes and Sources: For the sample of “great inventors,” see the text. The figure shows the distribution of patents by age over the inventors’ lifetime. Citations refers to the total number of modern patents that cited a specific invention, and provides an index of relative technical significance.

Creativity is commonly regarded as related to intensely personal factors such as age and psychological, cognitive or genetic characteristics (Eysenck 2008). The notion that inventors’ peak productivity occurs during their earliest years is based on common perceptions that genius manifests itself early in life because of innate abilities or theoretical expertise.⁸ This is not supported by the experience of eminent inventors; instead, like Edison, the majority of important inventions were created later in life (Figure 1). Moreover, few great inventors achieved their fame because of one

⁸Franses (2013) even claims to have identified a “Divine” relationship between age and creativity, based on fewer than two hundred observations of prices: “modern art painters make their best works at the optimal moment in their lives, a moment that could then be associated with the Divine proportion (the Fibonacci phi).”

or two lucky finds; instead, their careers typically encompassed decades, and more than half were active for over two decades. As for exceptional human capital, the majority of the American great inventors typically had little or no formal education, and many of those who attended college were trained in nontechnical fields. Even today, it is striking that many of the most innovative high-tech entrepreneurs, who have added enormous value to the economy and society, did not graduate from college.⁹

Rather than being randomly distributed, inventors and inventions were clustered in areas with low-cost access to burgeoning economic centers. Moreover, the great inventors took advantage of expanding opportunities by migrating in disproportionate numbers to take advantage of new opportunities, as well as by changing occupations to exploit their inventions. Indeed, they were significantly more mobile than the overall population, and more than 80 percent resided in a state other than that of their birth. Samuel Colt, Joseph Saxton, William Crompton, John Howe, and other eminent inventors even traveled to pursue business ventures in Europe. Both ordinary patentees and great inventors were disproportionately of immigrant origin when compared to the general population. For instance, Elijah McCoy, a black engineer, was born in Canada in 1844. Between 1870 and 1930, the foreign-born accounted for approximately 12 percent of the total population, whereas 21 percent of all patentees were foreign-born, as were 23 percent of the great inventors.

Foreign-born inventors illustrate the extent to which markets in patented ideas benefited the relatively disadvantaged. Immigrant inventors from the cohorts before the Second World War were significantly more likely to be from humble backgrounds than their U.S.-born counterparts. Nikola Tesla arrived in the United States with little money, and at one point earned his living through digging ditches. Jan Earnst Matzeliger, a black immigrant from Dutch Guiana, was an impoverished factory worker whose patented improvements resulted in enormous increases in the productivity of shoe manufacturing. Although many of these foreign great inventors were initially

⁹Eminent entrepreneurs without an undergraduate college degree include Bill Gates and Paul Allen (Microsoft), Larry Ellison (Oracle), Steve Jobs (Apple), Mark Zuckerberg (Facebook), David Karp (Tumblr), Peter Cashmore (Mashable), Michael Lazaridis (Research in Motion), Jack Dorsey and Evan Williams (Twitter), Shawn Fanning and Sean Parker (Napster), Michael Dell (Dell Computers), Travis Kalanick (Uber), Jan Koum (WhatsApp), and Daniel Elk (Spotify). Others like the co-founder of Alibaba, Jack Ma, obtained an unspecialized undergraduate degree in English. For discussions of entrepreneurship and creativity, see Gilad (1984); Kirzner (1999); Ward (2004).

of low-income groups with minimal education, they were able to sell off or leverage their patent rights to tap into capital markets to fund their projects.

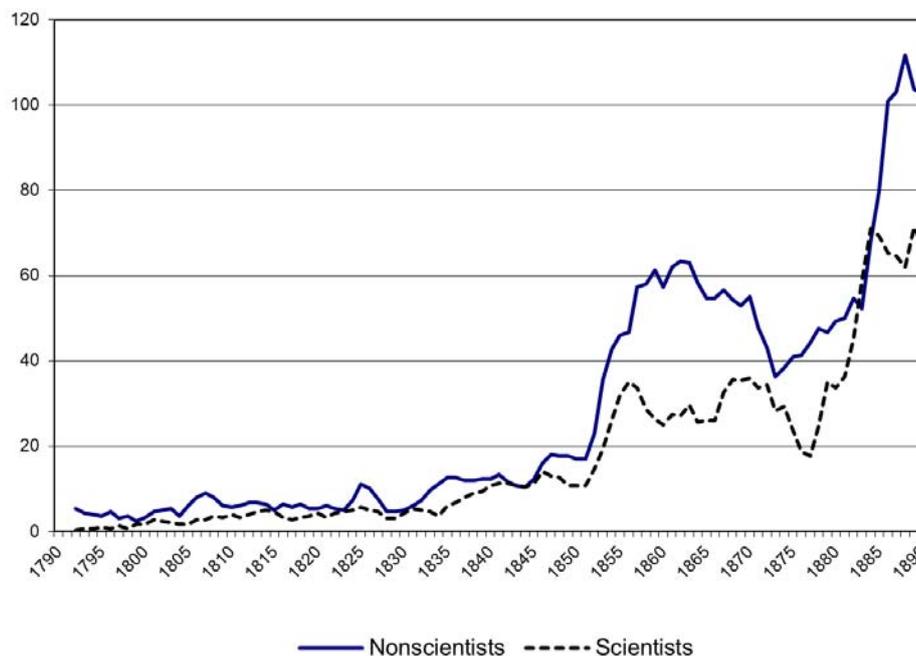


FIGURE 2. British Great Inventors: Patent Grants by Scientific Orientation, 1790-1890

Notes: For the sample of “great inventors”, see the text. Scientists include great inventors who were listed in a dictionary of scientific biography, or received college training in medicine, mathematics or the natural Sciences. The patent data were obtained from the Reports of the British Commissioners of Patents, various years.

In short, by almost all supply measures, the characteristics of the “great inventors” and their inventive activity were not so different from those of “ordinary inventors.” Moreover, in both Britain and the United States, the overall patenting of “great inventors” and “ordinary inventors” exhibited similar patterns (Khan 2011). The procyclicality of these time series indicates that patenting varied with expected profitability and changes in market demand. These general findings hold for all categories of inventors, including scientists and nonscientists (Figure 2). The patterns for eminent scientists do not support the hypothesis that inventors with rare human capital behave

differently. Rather than supply factors, the “great inventors” were characterized by more effective entrepreneurial responses to market demand.

The individuals who tend to be regarded as great inventors directed their attention toward “schemes of practical utility.” Their efforts were often inspired by the needs of the day, as the Civil War amply illustrates (Khan 2015b). Richard Gatling, a patentee of agricultural machinery, conceived of the Gatling Gun as a way to reduce the number of soldiers who would be exposed to risk to manage such weapons. The great inventors turned their attention to cartridges, rifles, ordnance, and war vessels, for a wartime total which amounted to 70 percent of all their military-related inventions since 1790. Prosthetic inventions rapidly increased during the Civil War, declined on the return to peace, then jumped again when the government announced subsidies for veterans who needed artificial limbs. The substantial wartime shift in the direction of inventive activity among great inventors paralleled the change in orientation by ordinary patentees.

Technical expertise or the creation of the most technologically-advanced discovery did not guarantee success in the marketplace, which depended on the scale of consumer demand. The typical great inventor combined ingenuity at both invention and commercial exploitation. More than 85 percent of the great inventors were directly involved in commercialization of their invention through manufacture, or both manufacture and licensing. Their enterprises incorporated the latest technology, including developments by other inventors. Cyrus McCormick, Charles Goodyear, and Richard Hoe, were typical in their aggressive management of extensive portfolios of owned and acquired intellectual property rights. Almost half of the postbellum great inventors engaged in patent litigation, and those who were principals in firms accounted for over two thirds of all lawsuits.

Markets in patented ideas were central to ensuring that rewards were effectively calibrated to contributions. When Abraham Lincoln declared the patent system kindled the “fire of genius,” nobody supposed he meant exceptional creativity was limited to a particular class or group. The American patent system facilitated the entry of relatively disadvantaged individuals into the field of technology, enabled them to specialize in invention, mobilize resources to fund patenting and commercialize their discoveries, and enhanced the diffusion of information and inventions. Patent rights comprised secure assets that were extensively traded, and gave inventors with only modest

resources the opportunity to appropriate private returns as well as to make valuable contributions to society.

If a panel of administrators had been tasked with identifying an array of inventors to elevate above their peers, the economic history of prize systems suggests they would almost certainly have failed to match the productivity and social contributions of the group that the market selected (Khan 2020). *Ex ante*, the population of great inventors was not especially distinctive in terms of age, education, or occupational background. Technological creativity was stimulated by higher perceived returns or demand-side incentives in general to make long-term commitments to inventive activity. Both ordinary and great inventors responded systematically to changes across time and place, and simultaneously contributed to the remarkable expansion nineteenth-century markets. In short, the experience of the great inventors highlights the democratic nature of the market for creative ideas that persists in the twenty-first century.

3. PRIZING CREATIVITY

Genius and creativity have always been associated with honorary and monetary “laurels,” and today there is a dramatic increase in prize awards for both technology and culture. Private and state sponsors alike are enthusiastic about the potential of prizes to reward (literal and figurative) stellar activity, and induce improvements in all areas of life. The America Competes Reauthorization Act of 2010 granted all federal agencies the authority to administer prize competitions. The European Innovation Council recently set aside several billion euros for prize contests. A prize of \$100 million from the MacArthur Foundation’s 100 & Change initiative hopes to fund “a single proposal that promises real and measurable progress in solving a critical problem of our time.” And, of course, prizes are especially prevalent in the conventional creative industries, which have been labeled an “economy of prestige” (English 2005). There is even a new Longitude Prize, undeterred by the failures of the first that was offered in eighteenth-century England, since “this time is different.”

Despite the current enthusiasm about prize systems, very little empirical attention has been directed to economically gauge their operation and effects (Khan 2015a). Theorists tend to model prizes in terms of perfect competition; instead, such systems involve monopsony arrangements, with an attendant deadweight loss that is compounded by political economic inefficiencies. Such awards have a nonmarket orientation, and lie at the extreme end of the spectrum from markets

to administered innovation systems. *Inventing Ideas* (Khan 2020) determines the nature and consequences of innovation prizes and other incentives for creativity in prominent institutions in Britain, France and the United States. The analysis of these administered innovation systems for technology and the arts reveals underlying characteristics that are invariant to region, industry, country, or level of centralization.

American prize systems included industrial and agricultural fairs, and such private organizations as the Franklin Institute of Philadelphia. However, prizes were not generally favoured in the United States, and were denounced as undemocratic and ineffective. By contrast, the European approach featured elitist, nonmarket-oriented institutions for both technology and culture. In Britain and France, a vast array of mechanisms supported and recognized creativity, including cash and honorary prizes for technology and the arts, medals for scientists, grants, subsidies, pensions, and other payouts. How well did these monopsonistic administered systems work as ex post rewards or ex ante incentives to induce useful ideas and valued expression? The short answer is, “very badly.”

British award systems ranged from Parliamentary payouts to prizes offered by private institutions. The Royal Society of Arts (RSA) in London, founded in 1754, is often regarded as a canonical “enlightened” institution whose prize system helped to induce the industrial revolution. Their meticulous account books reveal details about the RSA committees and their offers and awards for technological inventions and artistic works. The Society prohibited prize winners from applying for patents. It was assumed that elites would be more motivated by prestige rather than by mere profit, and cash awards fell over time relative to honorary awards. Although technological prizes were high on the RSA list of offers, artistic works comprised the majority of awards that the committees actually bestowed. We observe an adverse selection process: inventors with useful ideas obtained rewards in the market; whereas, the ones with lemons opted for prizes. Prizes were often related to rank and connections, and many were conveyed to works of rather obscure artists, for which there was no market.

Industrial fairs in Britain, France and the United States also presented prizes for artistic and technological creativity. When offered a choice between cash and medals, many firms opted for medals, which offered validation, advertising, and celebrity and enabled them to differentiate their products in the market. Honorary prizes are a good example of positional goods, whose signal

value depends on relative scarcity. At the same time, the scarcer the prize, the louder the disputes and concerns about bias, corruption and scandals. As a result, sponsors of honorary prizes had an incentive to escalate the number of awards, and owing to this depreciation in value, the winners likewise had an incentive to pursue higher tallies of awards. For instance, the Singer Sewing Machine Company proudly proclaimed that it had accumulated over two hundred prizes. However, as the proportion of winners increases, the signal value of the prize falls. In such star wars, when everyone gets a gold star, no one has a star. By the end of the nineteenth century, firms found it more effective to fund investments in marketing rather than the probabilistic pursuit of prizes.

Judges and committees typically lacked the ability to accurately gauge the market value of innovative technologies, or to appreciate the aesthetic values of new and disruptive art movements. As a result, my research shows that prizes had little relationship to productivity, or to progress in the field over the long run. Ginsburgh (2003) considered awards to books, movies and musical performances, and similarly concluded that such recognition was not closely related to quality or the persistence of the work over time. When judges are unable to objectively determine relative values, they tend to give out awards to people who already have demonstrated merit in the form of earlier awards. This cascade effect contributes to the very skewed observed distribution of prizes. In the cultural industries, this winner-take-all phenomenon is compounded by the promotion efforts and expenditures of major publishing companies.

Administered prize systems undoubtedly provided benefits to award panels, to sponsors and to competitors, but they did not offer socially efficient incentives for creativity, and failed to identify individuals or contributions that significantly added to social welfare (Khan 2020). Prize systems were inherently exclusive, selecting the few, even when many were equally deserving. In all cases, their operation was idiosyncratic, and it was impossible to predict the outcome based on objective characteristics of the invention (broadly defined). Results were primarily determined by the identity of judges and of applicants, rather than by the productivity or quality of the innovation. Economists tend to be concerned with price discrimination; with monopsonies a greater concern might be nonprice discrimination. Awards were not infrequently associated with nepotism and unfair discrimination against relatively disadvantaged groups such as women, nonelite candidates, and those without personal connections.

By the end of the nineteenth century, many prize systems had given way to markets. Indeed, the French *Salon des Indépendants* was formed in the summer of 1884 in reaction to the injustices of the existing institutions for selecting entries and bestowing prizes, where decisions were more often motivated by the panel’s biases and artists’ personal connections rather than by merit (Société des artistes indépendants 2000).¹⁰ The guiding rule of the Society of Independent Artists was that exhibitions of paintings had to be conducted “sans jury ni récompense” (without juries or prizes). Success in the art world would be determined by public preferences and willingness to purchase the item in the open marketplace, rather than by awards bestowed through exclusion by elitist “coteries” of influential patrons and professional critics. Today, the consensus is that the introduction of this democratic market for creativity in Paris resulted in some of the most innovative works of art in the twentieth century (in my own view, of all time).

4. COPYRIGHT AND CREATIVITY

To what extent is copyright protection related to genius and cultural creativity? Copyright rules and standards have changed almost beyond recognition over the past two centuries, so it is worthwhile to retrace their origins and economic rationale. Unlike patents, copyrights do not satisfy the economic conception of property, since they are not exclusive, do not require novelty, and it is impossible to specify the boundaries of the right. Copyright serves as one of the mechanisms to protect publishers’ fixed costs and their expenditures to differentiate products and promote superstars and celebrities. The majority of cultural industries are mediated by oligopsonies which filter the excess supply of creative expression, and contrive artificial scarcity to drive up prices above marginal cost. In short, oligopsony publishers serve a similar economic function as administered innovation institutions.

The founders of the U.S. intellectual property institutions would be hard-pressed to recognize the copyright regime that prevails in the twenty first century.¹¹ In the modern era, contentions that

¹⁰The official salons were often accused of bias, especially against women and foreigners. See Brauer (2014).

¹¹Most notably, the Constitution specified that such protection was for a limited period (initially fourteen years), whereas the present property right comes into existence on creation and with the term of a virtual perpetuity. The simple right to regulate unauthorized copies has transmuted into an expansive right to control use, and criminal enforcement now has the potential to reach into the private homes of consumers. Absolutist “moral rights” have appeared in state and federal legislation, and stronger support for the protection of data. The scope and depth of its subject matter encompasses broad segments of the economy and society, including derivative markets. The supposed crisis engendered by digital technology has strengthened lobbyists’ efforts to extend the reach of copyright protection. For economic and legal perspectives on copyright, see Heald (2019), Netanel (2008), Watt (2004).

U.S. intellectual property institutions were motivated by the need to promote creativity became more prevalent after the Supreme Court case of *Feist Publications v. Rural Telephone Service Co.* (499 U.S. 340 1991). That decision held that copyright protection required a certain modicum of creativity, and other courts and legal scholars have continued to expand on this allegation. *Eldred v. Ashcroft*, 537 U.S. 186, 2003, even claimed that the intent of the grant of intellectual property rights was “to encourage the creativity of ‘Authors and Inventors’.” This interpretation constitutes a marked departure from the utilitarian rationale of the American copyright regime.

British publishers had long realized that their continual efforts to expand the scope of copyright protection would be more likely to prevail if their claims were motivated in terms of a reward for the author’s creativity. Publishers in the United States similarly found it expedient to maintain this useful fiction, and promoted their own objectives by appealing to the inherent rights of authors, and the need for courts to ensure the just returns for genius and creativity. The interests of authors in the upper tails of the distribution are indeed aligned with those of publishers but, for the majority of producers of expression, strong protections for “creativity” tend to be irrelevant or even inimical to their interests. The supply of derivative works is positively related to extent of the public domain, which has continually shrunk owing to successful efforts by publishers to expand the scope of copyright.

The history of American intellectual property laws and practice shows that the fundamental principles of U.S. copyright have little to do with offering incentives for authors’ creativity. Copyright is filed through a registration system, and entries are not subject to any examination for specific criteria related to creativity such as novelty or utility. Given the nature of copyrightable assets, the transaction costs of enforcing any legal notion of creativity would be prohibitively high. As with all discussions of cultural creativity, it would be impossible to draw a bright line – or indeed any line – to determine an acceptable degree of creativity, or even a binary measure of its presence or absence. Justice Holmes had presciently warned against courts setting themselves up as monitors of creativity, since “It would be a dangerous undertaking for persons trained only to the law to constitute themselves final judges of the worth of pictorial illustrations, outside of the narrowest and most obvious limits. At the one extreme some works of genius would be sure to

miss appreciation. ... At the other end, copyright would be denied to pictures which appealed to a public less educated than the judge.”¹²

According to American doctrines of copyright, authors and proprietors were acknowledged to possess only an economic interest, and not an inherent right. Congressional reports reflect this pragmatic spirit: “The enactment of copyright legislation by Congress under the terms of the Constitution is not based upon any natural right that the author has in his writings, . . . but upon the ground that the welfare of the public will be served and progress of science and useful arts will be promoted . . . [*Copyright is granted*] *not primarily for the benefit of the author, but primarily for the benefit of the public*”¹³ Democratic access to knowledge and education for all members of society was a key feature in the American blueprint for social and economic progress.

George Washington reminded delegates in 1790 that “Knowledge is in every Country the surest basis of public happiness;” and urged them to promote new inventions, science and literature, and educational institutions.¹⁴ This objective was not new at the time; the American colonies had long bundled provisions for intellectual property rights and schooling in the same clause, reflecting the notion that universal access to education and incentives for learning and innovation achieved similar ends. In 1683, Pennsylvania’s Frame of Government authorized the colony to “erect and order all public schools, and encourage and reward the authors of useful sciences and laudable inventions in the said province.”¹⁵ Thus, the emphasis was decidedly not on personal creativity or the essential rights of authors. The primary purpose of American copyright was to promote social welfare through learning and the diffusion of knowledge.

As such, the first federal copyright statute was passed on May 31 1790, “*for the encouragement of learning*, by securing the copies of maps, charts, and books to the authors *and proprietors* of such copies...”¹⁶ During the first decade of the federal system, over 13,000 works were published, but it is worth noting that the majority of these early authors did not apply for copyright protection. In

¹²Bleistein v. Donaldson Lithographing Co., 188 U.S. 239, 1903.

¹³H.R. Report No. 2222, 60th Cong., 2d Sess. 7, 1909 (my emphasis). For contrasting perspectives, see Woodmansee (1984), Rose (1993), and Gordon (2014).

¹⁴<https://founders.archives.gov/documents/Washington/05-04-02-0361>.

¹⁵United States, Report of the Commissioner of Education, 1892-3, vol. 2, p. 1263, Washington, D.C., 1895.

¹⁶Act of May 21, 1790, 1st Cong., 2d Sess., 1 Stat. 124 (my emphasis). The copyright act required simple registration. Authors and proprietors were required to deposit a copy of the title of their work in the office of the district court in the area where they lived, and pay a processing fee of sixty cents. Registration secured the right to print, publish and sell maps, charts and books for a term of fourteen years, with the possibility of an extension for another fourteen-year term.

1790, John Barry was the first author to file for a federal copyright, registering his spelling book in the District Court of Pennsylvania. Copyright grants increased over time, partly because of the expanding scope of subject matter that could be covered. A cumulative total of only some 150,000 entries had been registered by 1870. Almost as many copyrights were recorded in the following decade, after the copyright system was rationalized and a mass market for cultural goods began to develop after the Civil War. Copyright records include classics of American literature such as Nathaniel Hawthorne's *The House of the Seven Gables*. Nevertheless, the majority of copyrights still related to works of low creativity, such as atlases, tables for measuring longitude, and school books, that satisfied the mandate to promote education.

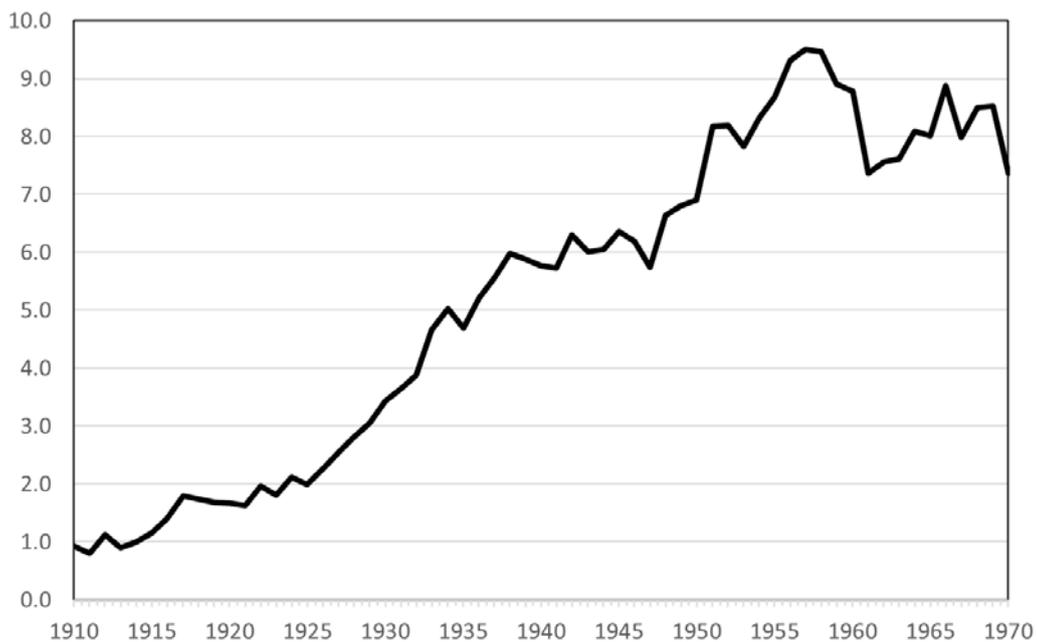


FIGURE 3. Copyright Renewals, 1910-1970 (percentage)

Source: Historical Statistics of the United States, Table CG1-15.

Copyright renewals provide valuable information about the nature of this institution (Figure 3). Despite the minimal monetary and transaction costs of renewal, very few copyrights were renewed for a second term. These works might have been abandoned because they were of low commercial

value. Alternatively, the authors and publishers could have been able to appropriate benefits from alternative means. Many early authors gave up all their rights in return for a single upfront payment. Non-copyright compensation to authors and musicians included subscriptions, patronage, honoraria, goods in kind, monetary awards, salaries, returns from complementary markets such as lectures and performances, and enhanced reputation. For instance, John James Audubon's monumental *Birds of America* was produced from hand-engraved plates between 1827 and 1838; the extremely costly project received advance funding from wealthy and aristocratic subscribers to the limited editions (Hart-Davis 2004).

Far from being an author's right of exclusion, publishers and other "proprietary" were able to file for the original copyright grant on their own accord.¹⁷ Table 1 (on the next page) shows that, from the earliest years of the copyright system, almost a half of all copyrights were issued to intermediary "proprietary," rather than to authors. Copyright was largely a means to ensure the publisher's right to profit, rather than to reward or encourage creativity. Reported lawsuits dealing with copyright disputes support these conclusions. Although copyright litigation is by no means representative, it still gives us valuable insights into the market for copyrighted material, the views of judicial policy makers, and changes in copyright enforcement over time. The reported cases brought before the courts between 1790 and 1909 are presented in Table 2 (on the page after the next). Significantly, the fraction of copyright plaintiffs who were authors (broadly defined) was initially quite low, and fell continuously throughout the period. By the final decade, less than 25 percent of all plaintiffs in copyright cases were "creative" individuals. Instead, the majority of parties bringing cases were publishers and other intermediaries or assignees of copyrights. Thus, in keeping with the data on copyright registrations, copyright enforcement was predominantly the concern of commercial interests.

¹⁷This can be contrasted with the strong protection under patent doctrines, where only the first and true inventor was able to file for the patent, and unauthorized access was forbidden in all circumstances.

Table 1: Characteristics of Early U.S. Copyright Registrations, 1790-1800¹⁸

	1790-1795		1796-1800		1790-1800	
OWNER	No.	%	No.	%	No.	%
Author	157	56.5	240	51.5	397	53.4
Other	121	43.5	226	48.5	347	46.6
SUBJECT						
Atlases, maps	23	8.1	34	7.0	57	7.4
Biography	11	3.9	31	6.3	42	5.4
Commerce	16	5.7	24	4.9	40	5.2
Dictionaries	20	7.1	14	2.9	34	4.4
Law	16	5.7	27	5.5	43	5.7
Music and poetry	25	8.8	61	12.5	86	11.1
Novels and fiction	4	1.4	15	3.1	19	2.5
Religion	41	14.5	49	10.0	90	11.7
Science and medical	23	8.1	56	11.4	79	10.2
Social and political	43	15.2	62	12.7	105	13.6
Textbooks	45	15.9	89	18.2	134	17.4
Misc. nonfiction	16	5.7	27	5.5	43	5.6
TOTAL	283	100	489	100	772	100

¹⁸Source: James Gilreath (ed.), Federal Copyright Records, 1790-1800, Washington D.C.: Library of Congress, 1987.

Table 2: Characteristics of Plaintiffs in Copyright Disputes, 1790-1909 (percentage)¹⁹

	1790-1879	1880-1889	1890-1899	1900-1909	ALL
AUTHORS					
Book author	24.3	20.9	18.8	8.6	17.3
Artist	6.3	0	2.9	6.6	4.3
Composer	1.8	0	0.7	1.3	1.0
Mapmaker	4.5	2.3	1.5	0	1.9
Photographer	0	3.5	9.4	4.0	4.5
Playwright	9.9	2.3	6.5	3.3	5.6
PROPRIETOR					
Producer	7.2	7.0	5.1	7.3	6.6
Publisher	21.6	37.2	42.0	52.3	39.7
Other	9.9	11.6	2.9	2.0	5.6
OTHER	14.4	15.1	10.1	14.6	13.3
TOTAL					
Number	111	86	138	151	486
Percent	22.8	17.7	28.4	31.1	100

This market orientation of American copyright is also evident in the subject matter of items that were the focus of litigation. American democracy has long been noted (or faulted) for promoting a mass market, and public tastes that value the practical over the decorative or artistic. Copyright protection in the Constitution “sought not to bolster a professional literary establishment of novelists, poets, and critics such as the one that existed in England but rather to ensure that books with demonstrably practical benefits to American society would be available to the readers of the

¹⁹Notes and sources: Reported lawsuits filed between 1790 and 1909. The “other” category includes financial companies, manufacturing enterprises, and miscellaneous entities. Figures may not add exactly to 100 percent because of rounding.

new Republic.”²⁰ Just as with copyright registrations, the majority of lawsuits involved disputes about “Feist-like” items associated a low degree of creativity, such as maps, atlases, legal treatises, law reports, dictionaries and directories.

Stipulations in early American doctrines regarding derivative rights, first sale, work for hire, and extensive fair use exemptions were quite different from the concerns under civil law or moral rights. Work for hire doctrines disavowed certain individual rights in order to facilitate market transactions. In 1895 (*Donaldson v. Wright*, 7 App. DC 45) Thomas Donaldson filed a lawsuit, effectively based on the author’s claim to a moral right of integrity. The plaintiff charged that Carroll D. Wright’s editing of Donaldson’s report for the Census Bureau served to “emasculate” his research and was therefore “damaging and injurious to the plaintiff, and to his reputation.” The court rejected this argument because Donaldson had been paid for his work and therefore “he has no right of property of any kind in the bulletin.” To do otherwise, it was further argued, would create problems in team projects where employees were hired to prepare data and statistics. In *Jones v. American Law Book Co.* (125 App. Div. 519, 1908), the contributor to the encyclopaedia was not even allowed the right to have his name on his article; whether or not work was attributed to him was entirely at the discretion of the publishing company that had hired him.

Courts hesitated to make decisions that would serve as a general tax on users and, when possible, protected the plaintiff from unauthorized or unfair use through other more targeted doctrines than copyright law. Thus, even in the absence of copyrights, plaintiffs could be protected by means of substitutable legal rules, such as unfair competition, trademarks, violation of contracts, misappropriation, as well as the right to privacy, and trade secrets. For instance, in 1901 E. P. Dutton & Company published a series of small attractive Christmas books with uncopyrighted material, that proved to be very popular. A competitor, Leon & Cupples, photographed and offered a series with similar appearance and style but at lower prices. Dutton did not have any copyright in the contents of the publications, but they nevertheless claimed a “distinct property right” in the look and feel of the books. The copying had caused them a loss of profits and tarnished their reputation as a maker of fine books. The court issued an injunction, agreeing that the defendants had unfairly misappropriated Dutton’s investments in reputation.²¹

²⁰James Gilreath, *Federal Copyright Records*, p. xxiii; also see Goff (1951).

²¹*Publisher’s Weekly*, “Unfair Competition in the Production of Books,” Feb. 2 1907, p. 631.

Despite its origins in the intellectual property clause, American copyright approaches a liability rule rather than a property right.²² As jurists realized, copyright “does not rest upon any theory that the author has an exclusive property in his ideas, or in the words in which he has clothed them” (Johnson v. Donaldson 3 FR 22 1880). Since colonial times, copyright grants were abridged with compulsory licenses which allowed users to obtain “unauthorized” access to works of authorship. Joseph Story outlined the American approach to “fair use” that still persists today: “we must often, in deciding questions of this sort, look to the nature and objects of the selections made, the quantity and value of the materials used, and the degree in which the use may prejudice the sale, or diminish the profits, or supersede the objects, of the original work.”²³ To promote social welfare, users were allowed access to copyrighted work without the explicit permission of the owner.

The market-orientation of fair use rules comprised an inherent feature of the American copyright regime. The boundaries of expression were defined not in terms of essential rights for creativity, but in terms of market valuations, and the impact on sales and profits. Fair use doctrines thus illustrate the extent to which policy makers weighed the benefits to the public against those of the copyright holder. If copyrights were construed as narrowly as patents, it would serve to reduce scholarship, prohibit public access for noncommercial purposes, and increase transactions costs for potential users. Most important, copyright without free access would inhibit learning which the statutes were primarily meant to promote.

4.1. International Copyright Piracy. Officially-sanctioned “piracy” provides another perspective on the liability rule approach to copyright that undermines absolutist arguments of moral rights and personal creativity. During its first century as a republic, American cultural output was not in high demand at home or overseas. U.S. copyright laws encouraged piracy of foreign works until 1890, because legislators deliberately calculated that the “balance on the ledger” favoured weak international copyrights (Khan 2005).²⁴ Supporters of strong copyright typically contend that the absence of such protection creates negative consequences for stakeholders. To test this hypothesis, I examined the effects of U.S. piracy of copyright materials through an analysis of

²²For the distinction between property and liability rules, see Calabresi and Melamed (1972). Schultz (2019) assesses the impact of compulsory licensing.

²³Gray v. Russell (10 F. Cas 1035, 1839), and Folsom v. Marsh (9 F. Cas 342, 1841).

²⁴Original Copyright Act, Chapter 15, May 31, 1790: “An Act for the encouragement of learning”: specified that “nothing in this act shall be construed to extend to prohibit the importation or vending, reprinting or publishing within the United States, of any map, chart, book or books ... by any person not a citizen of the United States.”

copyright registrations, information on authors, book titles and prices, financial data from the accounts of a major publishing company, and lawsuits regarding copyright questions. These data helped to identify the welfare effects of widespread infringement of foreign works, on American publishers, domestic and foreign writers, and the public.

To some extent, the persistent refusal to alter this policy over the course of a full century, even in the face of widespread international condemnation, provides its own tacit answer to the question of the consequences of piracy. The empirical evidence similarly does not indicate that piracy resulted in harm to American authorship and domestic creativity, ruinous competition to publishers, and the like. Instead, during the period when the United States was a net debtor in the flow of cultural products and had yet to develop quality cultural output of its own, it seems to have benefited from piracy of foreign works. Not only did Americans profit from copyright piracy during this period, so too did the European authors who were the targets of piracy. The quality and quantity of domestic American culture gradually evolved as markets expanded, and resulted in internationally competitive literary products. Only when the flow of funds moved in favour of the United States did policy allow for the reciprocal recognition of foreign copyrights.

Many observers claimed that the state of American literature was retarded owing to the availability of cultural products pirated from Europe. The evidence does not support the notion that American books were suffering from competition with cheaper foreign books.²⁵ Similarly, native authorship was not deterred by piracy, in part because foreign works were not entirely substitutable for books by American authors. In particular, nonfiction titles written by foreigners were less likely to be substitutable for nonfiction written by Americans, since geology, geography, history and similar works had to be adapted or completely rewritten to be appropriate for an American market. The most popular domestic grammars, readers, and juvenile texts were almost all written by Americans. Consequently, piracy did not much affect U.S. publishers of schoolbooks, medical volumes and other nonfiction. As for fiction, the gradual improvement in American writing over

²⁵After controlling for other factors that might influence price, books by American authors were actually less expensive than those by foreign authors, in part owing to lower perceived quality. This is not surprising, since prices are determined in accordance with a publisher's estimation of market factors such as the degree of competition and the responsiveness of demand to determinants. As one observer remarked of the 1891 reforms: "The book-purchasing public has not been seriously affected by the act, inasmuch as the ordinary law of supply and demand is sufficient to protect the general public against unfair prices..." (Wright 1901, p. 44.)

time is inconsistent with the hypothesis that the end of piracy markedly affected the market for fiction.²⁶

Foreign authors did not find that the end of legal piracy conferred any great advantage. Inframarginal writers like Scott and Dickens were compensated owing to competition on the part of American publishers to gain their “authorization.” Many foreign writers were rewarded by the expansion of the American market and the attendant network externalities. Piracy increased the scale of American readership of foreign works, in some instances far in excess of the high-priced and restricted European markets, and enabled appropriation in parallel markets. Dickens, in particular, leveraged his popularity among readers of his pirated works into a lucrative market for complementary fee-based lectures. His U.S. tour of 1867-68 earned the author \$228,000 in total receipts, well in excess of any European copyright-based returns.

Copyrights have always related more to publishers rather than authors. The conventional claim is that the absence of copyright brings about “ruinous competition,” which drives prices down to marginal cost and entails the inability to recoup high initial fixed investments. Instead, in the absence of legally-enforceable copyrights, publishing houses adopted alternative mechanisms, which allowed them to appropriate returns through private means. Their strategies altered to meet different circumstances, including cartelization of industry structure, price and quality discrimination across and within firms, and the creation of synthetic copyrights (Khan 2005). Publishing cartels acknowledged the exclusive right of a member to reprint specific authors, and enforced these synthetic copyrights through retaliatory measures. Some firms specialized in reputation and were able to secure greater returns in part because their higher price served as a signal of quality. The era of international piracy thus benefited consumers, the supply of cultural products increased, and publishers profited by adopting an array of creative business strategies beyond the boundaries of federal copyright.

4.2. **“Creative Industries” today.** More than two hundred years after the first copyright statute was passed in the United States, digital technologies constitute the new frontier, and many wonder

²⁶For fiction, the biggest increase occurs for the birth cohort between the 1840s and the 1850s, the members of which would have entered the market before the reforms of 1891. Expansions in the market, due to improvements in transportation and the increase in the literary and academic population, probably played a large role in enabling individuals to become professional writers. By the end of the nineteenth century most best-sellers in the U.S. were written by domestic authors, and professional authorship likewise grew gradually over time (Khan 2005).

if its challenges imply the virtual end of copyright. Digital products comprise pure public goods that are non-rival (consumption by one person does not reduce the amount that is available for others) and nonexclusive (unless active measures are taken to create artificial methods of exclusion, nonpayers are able to fully enjoy the benefits of consumption.) There are large economies of scale in production, copies can be made without regard to location and, apart from information costs, the transactions costs approach zero. Moreover, the good is infinitely durable, and can be replicated without degradation in quality, to the extent that it is effectively meaningless to distinguish between “the original” and “the copy.”

Publishers identify the advent of an unprecedented crisis, that threatens to decimate the supply of cultural goods. They focus attention on the amount of illegal sharing of music, movies and digital materials over the internet, and argue that this infringement reduces incentives for creativity. Objective scholarly research leads to mixed conclusions, but overall tends to support a more optimistic assessment.²⁷ The patterns for different cultural industries show declines in some areas, but significant increases in others.²⁸ At the present time, despite the continued apocalyptic predictions of lobby groups, the market power of publishing intermediaries has not diminished, and the supply of cultural creativity is significantly more democratic, diverse and inclusive.²⁹

Copyright filings are unrepresentative of overall creativity, but they allow us to shed some light on the question of whether cultural goods have been declining since the advent of the internet and the so-called new economy. Annual data on American copyright registrations begin in 1871, when 12,688 registrations were recorded by the Library of Congress. Total copyright registrations in the twentieth century grew steadily through 1990 (except for the adjustment period of the 1976

²⁷Rob and Waldfogel, 2006, p. 31: “While perhaps paradoxical to the law-abiding citizen, illegal downloading may actually alleviate the monopoly deadweight-loss problem. Indeed, downloading allows consumers to engage in a crude “do-it-yourself” form of price discrimination. . . . As stated above, our empirical results indicate that downloaded albums tend to be low valued, which suggests that the harm done by downloading is limited.”

²⁸The International Federation of the Phonographic Industry reported global digital revenues in the industry jumped from US\$20m in 2003 to US\$4.2 billion in 2009 (See the IFPI Digital Music Report, 2010, <http://www.ifpi.org/content/library/DMR2010.pdf>). According to the 2009 report from Nielsen Music, in the United States, the sale of single digital tracks increased 8.3 percent between 2008 and 2009, while sales of digital albums grew 16.1 percent. <http://blog.nielsen.com/nielsenwire/wp-content/uploads/2010/01/Nielsen-Music-2009-Year-End-Press-Release.pdf>

²⁹In the market for digital products, the scope and power of intermediation seems to have grown owing to increases in informational costs of unfiltered and unmediated transactions, and the greater potential for “versioning” and price discrimination. Observers have focused on the capacity of the internet to enable free use of copyrighted materials, but less notice is accorded to the significant reduction in the bundle of rights that legitimate purchasers are accorded. Digital versions of cultural goods are generally not owned in the sense of property rights in tangible goods that confer the right to use, exclude and alienate; instead, the purchase of digital goods is typically more analogous to a rental contract or a license to use.

reforms), and thereafter the trend becomes more variable. However, within the subcategories that were most likely to be affected by digital piracy, filings actually increased over the relevant period. The number of sound recordings grew from 22,743 in 1985, to 53,651 in 2007. Similarly, visual arts copyrights more than doubled over the same period, from 50,000 in 1985 to over 130,000 registrations in 2007. In 2018, the Library of Congress processed 252,235 literary works, 77,216 sound recordings, 93,651 visual art works, 136,399 in the performing arts and 512 miscellaneous items, for a total of over 560,000 copyright registrations.³⁰ The market for digital audiobooks has exhibited rapid and “extraordinary” annual growth during the past decade, in terms of new titles, sales, and profits.³¹ The numbers might have been even higher without piracy, but these unvarnished data of copyright filings in the creative industries do not support the claim that piracy disincentivized the creation of cultural goods.

This conclusion is consistent with the patterns over time for royalties and revenues, which offer a more accurate estimate of what some are pleased to call the “copyright ecosystem.” ASCAP and BMI (the American Society of Composers, Authors and Publishers, and Broadcast Music, Inc.), collective rights organizations that manage the public performance interests of music copyright holders, reported record growth in revenues over the past decade. Despite the sustained economic downturn, ASCAP earned “an all time financial high” of almost \$991 million in royalties in 2009; and in 2019, the organization “achieved historic, record-breaking financial results for the fifth year in a row, with total revenue topping \$1.274 billion.”³² BMI collected over \$917 million in royalties for its 2010 fiscal year that continued “a decade of unprecedented growth.”³³ In 2019, licensing revenues exceeded \$1.2 billion, a record that comprised an increase of 7 percent over the previous year. Besides these official sources, the music and video industries also experienced favourable upward trends in such revenues as advertisements on websites, payments from streaming music and video sites, funds generated directly from fans to performers and copyright owners, ringtones, and other related sources of income.

One is struck by the proliferation of innovative strategies to earn revenue streams without recourse to the copyright “tax on the public.” Startups are able to bypass the major labels and

³⁰<https://www.copyright.gov/reports/annual/2018/ar2018.pdf>

³¹<https://www.audiopub.org/uploads/pdf/APA-Sales-Survey-Press-Release-July-2019-with-2018-Data.pdf>.

³²<https://www.ascap.com/about-us/annual-report-2019b>.

³³ASCAP Annual Report, 2009, at http://www.ascap.com/about/annualReport/annual_2009.pdf; and the BMI Annual review, 2010, at <http://bmi.com/publications/entry/549767>.

take advantage of technology to process their music, market their output, and raise funding from diverse sources.³⁴ Services such as CD Baby and Magnatune enabled musicians to profit from a far larger percentage of revenues than they might have earned from associating with a traditional publisher.³⁵ “Pay what you want” pricing used by performers such as Radiohead and Nine Inch Nails allowed for self-identified price discrimination strategies that increased revenues for producers. Individual patronage, the major form of funding for art, drama and music prior to the expansion of the mass market for cultural goods in the nineteenth century, has also experienced a renaissance.³⁶ Crowdfunding has been used to finance movies such as *Blue Like Jazz*, which attracted 4495 investors, 25 of whom paid \$1,000 or more for the chance to appear as an extra in the movie, along with lunch on location with the cast and crew.³⁷

This expansion of nontraditional business models, however, has influenced the fringes rather than the traditional administered system dominated by publishing intermediaries. Despite publishers’ dire warnings about the end of culture, the “creative industries” have retained their oligopsony structure. In the market for music, artists in the major labels outperform other musicians in terms of concert revenues, sales of recorded music through physical and digital distribution, coverage by the conventional media, and popularity on social networks such as Facebook and Twitter.³⁸ A few performers have been propelled to celebrity status and financial success by unconventional means such as success on social media, but they remain atypical outliers. For the vast majority, stardom is a function of the marketing expenditures and investments that the major labels make to promote their career. Note that these findings are not due to higher quality of publisher-mediated output; indeed, independent artists obtain significantly higher ratings on a variety of measures including critical and consumer reviews.

³⁴Gopal, Bhattacharjee, and Sanders (2006), for instance, showed that lesser-known artists were able to benefit from free music downloads.

³⁵See <http://www.cdbaby.com/About>: “in a regular record deal or distribution deal, musicians only make \$1-\$2 per album, if they’re ever lucky enough to get paid by their label at all. When selling through CD Baby, musicians make \$6-\$12 per album and get paid weekly.” The firm claims to have distributed \$157 million to artists. For Magnatune, see <http://magnatune.com/info/whynotevil>.

³⁶See Kickstarter at kickstarter.com, an online mediator between patrons and performers “from the worlds of music, film, art, technology, design, food, publishing and other creative fields,” whose “projects are big and small, serious and whimsical, traditional and experimental. They’re inspiring, entertaining and unbelievably diverse.” Sellaband (sellaband.com) offers investors free downloads, exclusive CDs, t-shirts, free lunches with the artists, and other rewards. “And artists might even let you get a cut of their revenues.”

³⁷The project raised \$345,992, in excess of the original target of \$125,000. Three investors paid \$8000 each, for the author of the book to “fly to your city and do a book reading at your home for you and your friends! If you’re nice, he may even sing you a lullaby.” <http://www.kickstarter.com/projects/2128223578/save-blue-like-jazz-the-movie-0>

³⁸These findings are reported in Joseph (2010), who studied a sample of several hundred artists in the music industry.

Even if it is true that corporate copyright is in crisis, cultural creativity certainly is not. In the United States as a whole, in 2018 approximately a third of the adult population, some 83 million individuals, participated in a creative activity.³⁹ Surveys indicated that 23 million adults had recently played a musical instrument, 27 million engaged in photography, and millions more practiced choir, danced, wrote fiction, made pottery, and engaged in related pursuits. More than half of the residents of Alaska, Vermont, and Montana created or performed on their own account. A fifth of the adult population of Utah recently played a musical instrument, and more than ten percent of the population of Montana were creative writers. Cultural pursuits were not limited by education or income; for instance, in Alabama, a state with high poverty rates and relatively low levels of educational attainment, over 360,000 adults sang in choirs.⁴⁰

The production and consumption of digital creativity are often bundled together, in the sense that cultural consumption frequently engenders additions to innovative output. YouTube, in particular, has experienced exponential increases in activity and income associated with user contributions.⁴¹ The company reported in November 2010 that more than 35 hours of new videos were uploaded every minute, the equivalent of 176,000 feature films; just a decade later in 2020, over 500 hours of uploads were being posted each minute. These efforts include the creative efforts of ordinary viewers, as well as free samples from superstars who earn profits from the sale of complementary memorabilia and live performances. Some of these entries can earn significant returns, but the majority of videos and user material are uploaded as a means of self-expression without any expected reward besides the total number of views.

Facebook entries further illustrate the excess supply of uncurated creative endeavours even in the absence of financial incentives. The proliferation of activity on this aspect of media can be measured by the number of users (1.7 billion in 2020), the time spent (over 100 million hours daily viewing of videos), and the degree of creative engagement (350 million photos uploaded each day).⁴² Wikipedia offers another successful example of an open source model in the absence of effective copyright. Over the past two decades, this project has coordinated contributions from

³⁹These data are from the National Endowment for the Arts, *State-Level Estimates of Arts Participation Patterns: 2017-2018*. Available at <https://www.arts.gov/sites/default/files/ADP23-Brief5Access-2.pdf>.

⁴⁰National Endowment for the Arts, 2008 Survey of Public Participation in the Arts, Research Report #49. November 2009.

⁴¹<https://www.businessofapps.com/data/youtube-statistics/> .

⁴²See Facebook website, <http://www.facebook.com/press/info.php?statistics> .

thousands of unpaid authors. Participants made 521 million contributions in the twelve months ending in January 2020. The online encyclopaedia increases at a rate of 17,000 articles each month, for a total of more than 6 million articles, that would amount to over 2700 physical volumes, as compared to 32 volumes in the *Encyclopaedia Britannica*.⁴³

In short, far from being scarce, creativity is a universal human characteristic, and this is especially true of the supply of expression in the “creative industries.” Digital technologies have facilitated cultural creativity in music, art, performances, and social media, even/especially in the absence of copyright.⁴⁴ By contrast, copyright protection facilitates the operation of an administered system, where oligopsony intermediaries contrive scarcity, and promote selected “authors” to the upper tail of the distribution. And it is worth emphasizing that monopsonistic administered systems, where rewards and the allocation of resources are dictated by a few, are far too often associated with arbitrary outcomes and unfair discrimination in selecting the winners.⁴⁵

5. GAPS IN LEGAL AND ECONOMIC FENCES

Intellectual property is not only a legal construct, it is also a means by which we conceptualize and measure certain types of activities. At the same time, this accounting is incomplete, since many types of ideas and expression fall outside the designated scope of these artificially identifiable categories. Patent protection is limited to inventions that satisfy the legal and administrative rules for patentability, and the subject matter of copyright is similarly circumscribed, which implies that certain types of creativity are not represented. In particular, the legal balkanization of technology and culture in terms of patents and copyrights is in part responsible for the perception that certain groups are not particularly inventive. These gaps in legal fences suggest the need for some ingenuity

⁴³https://en.wikipedia.org/wiki/Wikipedia:Size_of_Wikipedia#Yearly_statistics. Wikipedia’s financial statements for 2018-2019 showed total assets of over \$176 million, with average annual donations of \$20 million, mainly from small donations of less than \$20 per person.

⁴⁴Scarce goods command a positive supply price. However, in the world of creative output, we observe an excess supply (“starving artists”) even when the price is zero or negative. In the latter case, suppliers actually pay to participate, such as weblog authors, and performers in some television shows who bear an opportunity cost to participate without any direct compensation, and individuals who pay to be movie extras. (This is separate from the superstar phenomenon, which relates to participants who engage in an activity for little or nothing in order to be eligible for the small chance of winning a large payoff.) See also the Rock and Roll Fantasy Camp, where participants pay \$10,000 for a week of pretending to be rock musicians (<http://www.rockcamp.com/index.html>.)

⁴⁵In 2020 such issues have drawn greater attention and controversy. For example, members of the French Film Academy filed an open protest against the lack of transparency and inclusiveness in awards and governance: https://www.lemonde.fr/culture/article/2020/02/11/le-monde-du-cinema-attaque-le-fonctionnement-des-cesars_6029171_3246.html. The prize contest for romance novels has similarly been cancelled because of the need for diversity and inclusion: https://www.rwa.org/Online/News/2020/Status_of_the_RITA_Contest.aspx.

if researchers wish to empirically account for human creativity in all its diversity. Such issues can be better understood by considering the relationship between gender and intellectual property.

Women have always been poorly represented on the roster of patented inventions.⁴⁶ The World Intellectual Property Organization (WIPO) notes that women were included among the inventors of just 9.5 percent of international patents filed in 1995, a figure that grew to 18.7 percent in 2019. WIPO was concerned that the marked gender imbalance in patents implied that “a huge range of talents is not being put at the disposal of humanity to help solve pressing social problems.”⁴⁷ However, from another perspective, it is not clear why we should expect equity in terms of a legal construct that arbitrarily cordons off certain types of creativity, and why it should be assumed that women have not been helping to solve social needs for the past two centuries. An alternative perspective is that there are many dimensions to creativity, and interested parties like WIPO are too myopic in their accounting for women’s contributions to social welfare.

Economic studies similarly suffer from conceptual gaps that obscure the contributions of women, and we may identify at least three deficiencies in gauging creativity by gender. First, the economic analysis of new goods is biased toward the “grand innovation” model that characterizes inventions in terms of sharp discontinuities and economy-wide disruption, and ignores or dismisses incremental inventive activity. According to Bresnahan and Gordon (2008), “new goods that establish entire new categories (like the automobile) will be economically more important than improvements that occur within categories.” This heuristic of approaching technological innovation in terms of broad discrete categories—“the” jet plane, telephone, radio, automobile, or computer – mischaracterizes the inventive process. It further has negative implications for the assessment of women’s technological contributions, which tend to be located well within such expansive categories.

Second, it is difficult to accurately measure creative activity within the household and other nonmarket sectors. Ironically, a number of representatives of the women’s movement denigrated and attempted to draw attention away from traditionally domestic “feminine inventions,” in favour of idealized heroines of invention who produced technical machinery on par with inventions by men.

⁴⁶In the American patent system, creative women have always had the same standing as their male counterparts. The first U.S. Patent Act of 1790 specified “That upon the petition of any person or persons that *he, she, or they*, hath invented or discovered any useful art, . . . it shall be lawful . . . to cause letters patent to be made out in the name of the United States” (my emphasis). Women inventors in the United States also benefited because patent fees were deliberately kept low, so that the sole filter was technical creativity rather than financial standing. The Patent Office was the first federal institution to hire women and offer equal pay to their male counterparts.

⁴⁷WIPO, “Gender Equality and IP,” https://www.wipo.int/women-and-ip/en/news/2020/news_0001.html

Third, empirical work generally fails to consider non-IP-oriented creativity that lies at the borders of aesthetics and utility, and of art and technology narrowly defined.⁴⁸ Research in marketing and consumer goods finds that significant market value is attached to such artistic and aesthetic components of products. This suggests a need to consider whether women did indeed tend to make disproportionately greater contributions in just these areas, and whether part of the “gender gap” derives from these analytical gaps.

Women undoubtedly faced institutional barriers to their social and economic activities (Khan 2016, 2017a). However, other institutional substitutes such as family-based apprenticeships and personal networks played a central role in overcoming some of these obstacles. European patent systems and legal institutions featured rules and standards that disadvantaged ordinary women, but more privileged women and those associated with family firms were able to circumvent or reduce the attendant obstacles.⁴⁹ Geographical and familial networks could also compensate for a lack of formal technical training. “Hattie” Elizabeth Emerson, the daughter of a successful inventor of knitting machines in Ohio, patented her own tubular knitting machine when she was only twenty years old, and invented another improvement four years later. Hattie married William E. Hinchliff, who patented two knitting machine inventions, and their son obtained similar patents himself. Flexibility to overcome legal and social constraints is in itself a mark of creative abilities.

Khan (2020) empirically evaluates women’s creativity in different institutional settings, both within and beyond the patent system, and across different nations, during the first and second Industrial Revolutions. This study of over 12,000 women inventors in Britain, France, and America reveals new insights about gender and creativity. This systematic assessment of women’s creativity within the household sector and market distinguishes patentable and unpatentable creativity, improvements in consumer final goods, and changes in designs. Many women directed their creativity to novel ideas that proved to be valuable in the market for inventions. However, women were significantly more likely than men to be associated with unpatentable innovations such as the look and feel of consumer final goods; and design-oriented products at the boundary of art

⁴⁸Women inventors were especially concerned with the look and feel of improvements (Khan 2017b). Digital text analysis of early patent specifications for high-frequency adjectives regarding aspects of beauty or appearance results disproportionately in patents by female inventors. Such concerns were central to market demand for many of their creations, since attractive appearance was a valuable form of perceived quality and product differentiation in areas such as women’s clothing.

⁴⁹In Britain and the United States, two-thirds of women’s patents were issued to inventors who never filed a second patent, whereas almost three-quarters of French women patentees were multiple patentees.

and technology. Both their patented and unpatentable creativity were often directed to promoting welfare within the household.

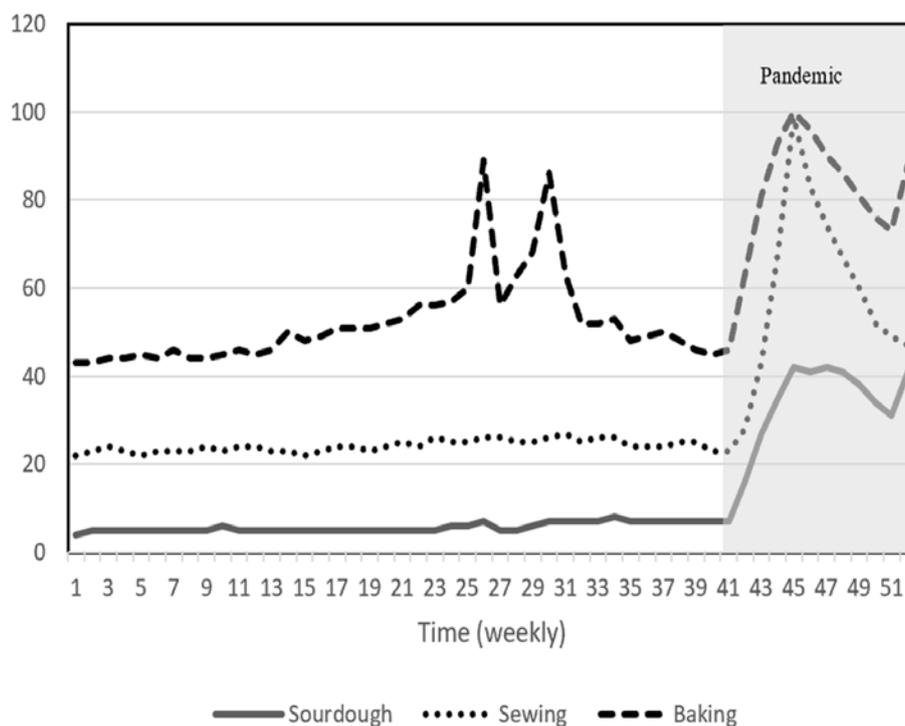


FIGURE 4. Index of Household Creativity during Pandemic

Source: <https://trends.google.com>. Notes: The graph shows search interest for a particular activity, relative to the highest point on the chart at a specific point in time. The time period is by week, from June 2019 through May 2020.

Both need in the market and need in the household promoted social progress. For instance, women on the American frontier disproportionately devised improvements to remedy their lack of access to household help.⁵⁰ Activities in the household had a shadow price, and also responded to incentives and opportunities that women and others in the household encountered. During the first half of 2020, a similar process can be seen in response to the pandemic. The widespread economic shutdown effected a dramatic increase in creativity within the household, to compensate for the lack of goods and services in the market. As Figure 4 illustrates, the crisis motivated investments in creativity for baking, sewing, and experimenting with home-made leavening agents.

⁵⁰Unlike the patterns for women in the labour market, female creativity ranged over the entire life cycle and was typically not interrupted by marriage. Indeed, many discoveries were motivated by the challenges they encountered in the course of their duties as mothers, wives, and managers of households.

Women’s creative contributions were welcomed in the marketplace. Some of these comprised complex patentable machinery, but most were unpatentable contrivances that demonstrated women’s comparative advantage in art, design and domestic innovations. In France, Madame Amélie de Dietrich was credited with being the first to introduce decorative designs into industrial products made from cast iron in her innovative business enterprise. The unpatented “Cincinnati faïence” methods of Mary Louise McLaughlin, a ceramic painter and potter, strongly influenced the American arts and crafts sector. Maria Beasley, one of the most successful heroines of invention, specialized in barrelmaking-machinery that contemporaries deemed “the most remarkable inventions of labor-saving machines of recent date,” but her last invention was a device to knead dough that saved labour in the household.

By contrast, women were significantly less likely to be awarded prizes for their innovations, in all institutions and in all countries (Khan 2020).⁵¹ The Franklin Institute of Philadelphia administered the Scott prize that the donor designated to benefit “ingenious men or women,” but prize-winners were overwhelmingly male, and no woman was recognized with an award of any sort in the antebellum period. Just five women received prizes from the institute’s Committee on Science and the Arts over the entire nineteenth century. Scientists, prominent industrialists, and wealthy men of influence dominated the roster of recipients. It is not surprising that women and other disadvantaged groups internalized the anticipated bias and generally opted not to participate in these administered innovation systems.

6. CONCLUSION

Economics focuses on choices under conditions of scarcity. As such, creativity in itself is perhaps not the proper study of economics, because creativity is a basic human characteristic that is not in scarce supply. Indeed, some forms of cultural expression are so prevalent among the general population that they are often associated with a negative price. As Ortega y Gasset (2019) warned, scholars should “beware of notions like genius and inspiration; they ... should be used sparingly by anybody who wants to see things clearly.”

However, economists do have a great deal to contribute to our understanding of the rate and orientation of particular creative activities. My own research shows how, like most human behaviour, creative ideas and expression were influenced by institutions and specific incentives. Instead of rare supply-side “genius,” exceptional performance in technology and culture tended to be related to the capacity for scalable solutions and commercialization that satisfied market demand. Property rights in patents facilitated markets and diversity in ideas and individuals, whereas innovation prizes and publishers’ copyrights functioned as administered systems that arbitrarily benefited the few rather than overall social welfare.

Future research can profitably pursue other features of the economics of administered innovation systems. In particular, more theoretical and empirical studies of buyer monopolies are needed to

⁵¹The Maryland Institute for the Promotion of Mechanic Arts even rewarded creativity by gender: men were granted gold and silver medals, whereas women received butter knives, ladles, teaspoons, pencils, and thimbles.

address the operation and organization of such firms, especially as intermediaries in the cultural industries. My own evaluation of innovation prizes and state administration of awards demonstrates that decisions within administered systems tend to be motivated by the identities of participants rather than by supplier productivity, often leading to biased outcomes. Economics can help to illuminate current concerns about inclusion, diversity and social justice, by venturing beyond standard questions of price discrimination, to assess the potential for monopsonies to engage in unjust discrimination on the basis of gender and other ascriptive characteristics.

A final gap in our accounting of creativity relates to the lack of empirical attention to household matters. In the pandemic era, the boundaries of market and household have become much more fluid. This extension of familial transactions reminds us, as the Women’s Rights Convention in New York declared in 1852, “the economy of the household is generally as much the source of family wealth as the labor and enterprise of man.” The blank pages in records of household economic activities are undoubtedly related in part to our current inability to parse apparent gender differences in creativity. More serious attempts to account for the demand and supply of creativity within the household economy promise to enhance our understanding of the sources of economic growth and social progress.

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