COPYRIGHT LAW AND KNOWLEDGE CREATION:
A STUDY OF COPYRIGHT TERM LENGTH IMPACT ON KNOWLEDGE CREATION AND LEARNING

A dissertation presented by
Shahram Haydari

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ABSTRACT OF DISSERTATION

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Abstract

The Constitution of the United States empowers Congress to pass copyright laws to promote knowledge creation in the society. Many economic studies have been conducted on copyright law, but very little research has been done to study the impact of the law on knowledge creation. In this dissertation, I study the length of the copyright term, the rationales and motivations behind extending the length in Copyright Term Extension Act, and how much those rationales and motivations are aligned with knowledge creation and learning. The qualitative analysis of the hearing sessions and floor debates demonstrates that supporters of the extensions offered macro and micro economic rationales that are not necessarily aligned with the promotion of knowledge and learning. Opponents of the extension argued that the extension would stifle the expansion of knowledge. In the second part of this dissertation, I develop and analyze an agent-based model to investigate the impact of different copyright terms on the creation and discovery of new knowledge. The model suggests that, for the most part, the extension of copyright term hinders scholars in producing new knowledge. Furthermore, extending copyright term tends to harm everyone, including scholars who have access to all published articles in the research field.

Keywords: Knowledge Creation, Copyright Law, Copyright Extension, Agent Based Modeling, Division of Labor, Complex Systems, Public Policy Analysis
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Chapter 1: Introduction

Copyright law, like patent law, has its roots in the Article 1 Section 8 (Copyright Clause) of the Constitution. This clause empowers the United States Congress “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”¹ According to Walterscheid, the progress of science and useful arts in the context of the 18th century translates into “the advancement of useful knowledge and discoveries.”² The main purpose of copyright law is not primarily to generate revenue for authors nor prevent illegal distribution of copyrighted materials. Congress is empowered to enact copyright laws, as specified in the Constitution, to advance useful knowledge and learning in society.

It is certainly important to think about the impact of copyright law on the market and freedom of users, and to study the opportunities and the side effects that the law creates in the society. However, as a first step, it is crucial to examine how the law contributes to the very purpose specified in the Constitution, the advancement of knowledge and learning in the society. There is very little published literature addressing this critically important question.

Study Purpose & Significance

The purpose of this dissertation is to study how and to what extent current copyright law contributes to the advancement of knowledge and learning in society, in the context of the 21st century, considering the availability of the Internet and the digital technology. Without measuring the impact of copyright law on knowledge creation and learning, it is impossible to talk about the effectiveness of the law in terms of the purpose set out in the U.S. Constitution. Continuous improvement of copyright law requires measuring the contribution of the law towards the goal specified in the Constitution. The outcome of this research will help lawmakers

¹ U.S. Const., Art. 1, Sec. 8, Cl. 8
to have a better understanding of the impact of copyright law on *knowledge creation and learning* and will enable them to pass new copyright laws that promote creativity more significantly and reduce roadblocks towards learning.

**Study Questions**

The main topic in my study is how the length of copyright term impacts knowledge creation and learning in the society. To better understand this impact, I will focus on the following questions:

1- To what extent was knowledge creation and learning discussed during the floor debates and congressional hearings before the enactment of Copyright Term Extension Act (CTEA)?

2- To what extent has the promotion of knowledge creation and learning been formulated into CTEA?

3- Does copyright term extension impact knowledge creation positively?

4- How can we improve the current copyright law in terms of its length to achieve the goal envisioned in Copyright Clause in the Constitution more effectively?

**Copyright Law**

Copyright Clause was incorporated into the Constitution on September 17, 1787, which empowers the United States Congress, “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” Over the course of the time, copyright law has been expanded to more rights and longer duration to copyright holders.

England’s Statute of Anne, enacted in 1709, is considered the origin of the first copyright law in

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3 U.S. Const., Art. 1, Sec. 8, Cl. 8
4 Copyright Act of 1710, U.K. statutes at large (1710)
the United States. The first copyright law in the U.S. secured fourteen years of rights for authors. The author could also renew copyright for another fourteen years if she was alive at the point of fourteen years. If she did not renew copyright, the work was passed to the public domain. The renewal mechanism in the first copyright policy insured only works which were worth renewing would remain protected and the rest of the works would return to public domain. During the first 10 years after passing the first copyright law, only five percent of the works were registered to be protected under the Copyright Act of 1709. The remaining ninety five percent immediately passed to the public domain. Although authors had the right to renew copyright for the second fourteen-year term, only few renewed and the rest allowed the work to be passed to public domain. Even today, most books go out of print a few years after publishing and most creative works have a commercial life of a couple of years.

In 1831, the initial term of copyright increased from 14 years to 28 years. This change brought the total available years for authors to protect their works to 42 years. In 1909, Congress extended the term of renewal to 28 years, which meant authors could protect their works up to 56 years. Under the 1909 Act, federal statutory copyright protection attached to original works only when those works were published and had a notice of copyright affixed. In 1976, Congress extended all existing copyrights by nineteen years. In 1998, in Copyright Term Extension Act (CTEA), Congress extended the terms to life of the author plus 70 years and for works of corporate authorship to 120 years after creation or 95 years after publication, whichever endpoint is earlier. The constitutionality of the act was challenged in the court, and ultimately,

6 Copyright Act of 1790, 1 Stat. 124 (1790)
7 Works in public domain are those works that their intellectual property rights have expired.
9 Copyright Act of 1831, 4 Stat. 436 (1831). §16
10 Copyright Act of 1909, 35 Stat. 1075 (1909). §24
11 Copyright Act of 1909, 35 Stat. 1075 (1909). §8
United States Supreme Court held the act constitutional.\textsuperscript{13}

Since 1790, copyright term has been expanded, but more importantly in 1976, the system of renewal of copyright was removed from the law and every book and other creative work received the maximum term. Prior to copyright act of 1976, the two-part regime required owners of copyrighted works to renew the license after the initial term, if they preferred not to let the work to be passed to public domain. This system kept only those works which had commercial value under the protection of copyright. In “Free Culture,” Lawrence Lessig demonstrates the impact of extensive increase in copyright term on works released to public domain.

In 1973, more than 85 percent of copyright owners failed to renew their copyright. That meant the average term of copyright in 1973 was just 32.2 years. Because of the elimination of the renewal requirement, the average term of copyright is now the maximum term. In thirty years, then the average term has tripled, from 32.2 years to 95 years.\textsuperscript{14}

The Act of 1976 also codified the doctrine of fair use, which has been used in courts since 1840.\textsuperscript{15} Under section 107, the fair use of a protected work is not copyright infringement, even if such use technically violates copyright protections found in section 106, which gives exclusive rights to the owners of copyrighted materials.. Despite all the benefits of the fair use doctrine for promoting cumulative creativity and free expression, unpredictability continues to lurk around this area of law.\textsuperscript{16} Many users and creators do not know what is considered fair use and do not fully utilize the doctrine.

With the commercialization of the Internet and the digitalization of copyrighted materials including music, books, and movies, the government became more concerned about copyright

\textsuperscript{13} Eldred v. Ashcroft, 537 U.S. 186 (2003)
\textsuperscript{15} Copyright Act of 1976, 90 Stat. 2541 (1976). §107
infringements. To protect the intellectual property right of American citizens, and more importantly comply with World Intellectual Properties Organization (WIPO) treaties, Congress passed Digital Millennium Copyright Act (DMCA) in 1998. DMCA has substantial impacts on the users of digital technologies and it criminalizes the production and dissemination of technology, devices, or services intended to circumvent measures that control access to copyrighted works.\textsuperscript{17} It also criminalizes the act of circumventing an access control, whether or not there is an actual infringement of copyright. In the physical world, copyright law gives copyright owner of a book no legal control over how many times she reads that book. That is because when you read a book in real space, that “reading” does not produce a copy. And because copyright law is not triggered, no one needs any permission to read the book, lend the book, or sell the book.\textsuperscript{18} Ordinary uses of the book are free of regulation. Ordinary uses are unregulated. But in the digital world, the same acts are differently regulated.\textsuperscript{19}

DMCA heightens the penalties for copyright infringement on the Internet.\textsuperscript{20} Under the current copyright law, downloading copyrighted materials from the Internet without fully paying the rights of the owner is an illegal activity and there are punishments for such actions. The statutory damages for each violation of section 1201 of DMCA can be up to $2,500 per act of circumvention of copyright protection systems.\textsuperscript{21} For instance, if someone circumvents copyright protection systems as specified in section 1201 and downloads 100 songs, the person can be liable up to $250,000.

\textsuperscript{17} Digital Millennium Copyright Act, 112 Stat. 2860 (1998). § 1201
\textsuperscript{18} First Sale Doctrine, 17 U.S.C. § 109
\textsuperscript{21} Digital Millennium Copyright Act, 112 Stat. 2860 (1998). § 1204
Since its inception, copyright law has gone through many iterations of modifications. The term of copyright protection has been extended significantly. Congress has secured significant rights to owners of copyrighted materials by limiting access to end-users. Using an economic model, Landes and Posner argue that copyright law should balance financial incentive for creators and the cost of expression.\textsuperscript{22} In another economic analysis of copyright law, it is shown that the supply of work and economic incentive are positively correlated for big screen movies. However, CTEA seems to have insignificant impact on new creative works.\textsuperscript{23} This finding is consistent with Tor and Dostan who show the extension of copyright from lifetime plus fifty years to lifetime plus seventy years provides little additional incentive to create.\textsuperscript{24} In an empirical study, Landes and Posner compare the current length of copyright law to a short fixed term with the possibility of indefinite renewal right and conclude that the expected economic life of most copyrighted works is short. They argue that the size of the public domain expands under the latter system, and a system of indefinite renewals will separate valuable works from works in which the cost of continuing that protection exceeds the sum of administrative and access costs.\textsuperscript{25} Although these economic studies of copyright law are very informative, they do not clarify whether the recent amendments to copyright law, CTEA, resulted in the promotion of knowledge creation and learning. In his book “Open Access”, Peter Suber argues authors and scholars are better off in many circumstances to publish open access. Referencing a study conducted by Research Information Network, he adds about 60 percent of surveyed researchers responded that access limitations hindered their research and the concerns are not confined to just institutions with limited financial resources. Even wealthiest academic libraries are suffered by access limitations.

\textsuperscript{25} Landes, \textit{The Economic Structure of IP Law}, 234-253
limitation. Economic incentives may play an important role in creation of particular copyrighted materials such as music, motion pictures, and photography, but not so significant in creation of scientific journal articles and scholarly books. Rowlands and Nicholas surveyed 5513 senior journal authors to study the behavior and attitude of authors. They found that most authors are indifferent about retaining copyright and emphasize the importance of peer review process. In a separate study commissioned by Elsevier, the publishing company, 6344 authors were surveyed with 70 follow-up phone interviews. In this survey, “disseminate the results” was the most important reason for publishing given by those who were surveyed. In the following section, I will review the literature in which researchers study knowledge creation process and what encourages researchers to create such works.

Knowledge Creation

Knowledge, as defined in Oxford dictionary, is familiarity with someone or something, which can include information, facts, descriptions, or skills acquired through experience or education. It can refer to the theoretical or practical understanding of a subject. “Knowledge” is an extremely loose word. Scholars in different disciplines have tried to explain knowledge from different angles. Jakubik summarizes how different disciplines contribute to learning and knowledge creation. The most traditional account of knowledge is the “Justified True” which is derived from Plato’s works. Philosopher Alvin Goldman defines knowledge as “... true belief

arrived at via appropriate means, methods, or sources.”

Nonaka considers knowledge to be “a dynamic human process of justifying personal belief toward the truth.”

Polanyi classified human knowledge into two categories. "Explicit" or codified knowledge refers to knowledge that is transmittable in formal, systematic language. On the other hand, "tacit" knowledge has a personal quality, which makes it hard to formalize and communicate. According to Polanyi, we can know more than we can tell. Tacit knowledge is deeply rooted in action, commitment, and involvement in a specific context. In Polanyi’s words, it “indwells” in a comprehensive cognizance of the human mind and body.

Goldman offers a similar concept. He believes knowledge-producing methods or sources can be either internal or external. He counts perception, memory and reasoning as the internal sources of knowledge that is part of human mind; while, testimony such as publishing papers and discourse such as giving a lecture are external sources of knowledge.

How do we acquire knowledge? Nonaka borrows Polanyi’s categorization of knowledge and defines knowledge creation in four steps: Socialization, Externalization, Combination and Internalization (SECI) (see Figure 1.1). He argues in this process, knowledge converts from (1) tacit knowledge to tacit knowledge, (2) from tacit knowledge to explicit knowledge, (3) from explicit knowledge to explicit knowledge and finally (4) from explicit knowledge back to tacit knowledge again. In the first phase, through interaction between people, knowledge is tacitly converted (i.e. Socialization). For instance, apprentices work with their mentors or students learn from their professors. In the Externalization phase, the tacit knowledge is articulated to become explicit. In this phase of the process, knowledge is crystallized which allows it to be

35 Goldman, "Group Knowledge Versus Group Rationality", p:1
shared by others. In the third step, explicit knowledge is combined into more complex sets of knowledge. In the last step, the externalized knowledge that has been disseminated in the community becomes internalized.\textsuperscript{36}

![Figure 1-1: The SECI Process](image)

Nonaka describes this process as a spiral in which the interaction between tacit knowledge and explicit knowledge will tend to become larger in scale and faster in speed as more actors in and around the community become involved in the process. This is a process that starts in the individual level and gradually more people become involved.\textsuperscript{37} When performing knowledge intensive tasks, scholars and experts face new problems and they need a circle of individuals to informally interact with to reduce uncertainty and solve problems.\textsuperscript{38} Communication among scholars allows them to reach an impressive aggregate of knowledge and increase social fund of knowledge by sharing without each scholar being required to independently explore and


\textsuperscript{37} Ikujiro Nonaka, Ryoko Toyama, and Noboru Konno. "SECI, Ba and leadership: a unified model of dynamic knowledge creation." \textit{Long range planning} 33, no. 1 (2000): 5-34.

discover the facts.\textsuperscript{39}

What does encourage scientists and scholars to create new knowledge and disseminate it? Aristotle believes “All men by nature desire to know.”\textsuperscript{40} Does this mean impure non-epistemic agendas can derail knowledge creation? Epistemologists, social epistemologists, and philosophers of science have pondered upon this question. Credit, respect, and honor can motivate scholars and scientists to create new knowledge and publish papers, said Goldman.\textsuperscript{41} This system also encourages openness in science.\textsuperscript{42} Bonilla takes this idea even further and argues that scientists’ main motivation is not the pursuit of truth but the pursuit of recognition.\textsuperscript{43} Hull accepts the role of credit seeking in the expansion of knowledge and explains which sorts of credit are considered most important as well as the effects that this striving for credit has on science.\textsuperscript{44} Scholars may prefer minimal copyright protection because it increases the level of access to their scholarly work and result in academic promotions and improve academic prestige for them.\textsuperscript{45}

I will use credit seeking as a motive for scholars to generate more knowledge in my research as referenced by scholars in philosophy of science and epistemology fields. In the literature, I did not find references to wealth and profit making as a direct motivation for creating knowledge. In the second part of the design section, when I describe my Agent Based Model, I will focus on external and explicit type of knowledge that is reflected in published journal articles.


\textsuperscript{40} Aristotle’s metaphysics.

\textsuperscript{41} Goldman, Knowledge in a Social World, Location 3864 in Kindle Edition.


\textsuperscript{44} “Credit comes in a variety of forms from prestigious prizes to citations. Of these, one sort of credit is most fundamental-the use that one scientist makes of the work of another. The success that is central to science is not career advancement but mutual use. Science has the cumulative character it has in part because of this sort of credit. Because scientists must use the work of other scientists, they are forced to cooperate in a metaphorical sense with even their closest competitors, i.e., use their work.” See David Hull, \textit{Science as a Process: An Evolutionary Account of the Social and Conceptual Development of Science} (Chicago: University of Chicago Press, 1988).

Chapter 2: Methods Discussion

I applied a mixed method to address the research questions of this dissertation. I answered question 1, “To what extent were the phenomena of knowledge creation and learning discussed during the floor debates and congressional hearings before the enactment of Copyright Term Extension Act (CTEA)?”, and question 2, “To what extent has the promotion of knowledge creation and learning been formulated into CTEA?”, using a qualitative study and Discourse Analysis technique. To answer question 3, “Does the current length of copyright term impact knowledge creation positively?”, and question 4, “How can we improve the current copyright law in terms of its length to achieve the goal envisioned in Copyright Clause in the Constitution more effectively?”, I applied a mathematical modeling technique, Agent Based Modeling. I review both techniques in this chapter before share the findings of the research in chapters 3-5.

Discourse Analysis

To understand how much the phenomena of knowledge creation and learning were discussed during the floor debates and congressional hearings and ultimately formulated into the current copyright law, I used discourse analysis. 46 Discourse analysis is the scrutiny of the language considering the context in which it is used as well as who uses the language. This qualitative technique allowed me to determine the purpose of the law by studying the congressional hearings, floor debates and the reports from committees that happened in Congress during the enactment of the CTEA.

46 Discourse Analysis is a proper method to analyze congressional hearings and floor debates. It allows a deep and systemic understanding of the documents. Here are few research examples that applied the same method for analyzing congressional hearings:

1- Dave White, "A Discourse Analysis of Stakeholders? Understandings of Science in Salmon Recovery Policy" (PhD diss., Virginia Polytechnic Institute & State University, 2002).


Discourse analysis let me get into the depth of the discussions and debates and helped me understand the objectives of the provisions of the law. It enabled me to clarify the rationale behind various provisions of the law to ultimately understand to what extent the objectives of the law are in harmony with knowledge creation.

In my discourse analysis, textual documents were my units of analysis. I looked for rationales and objectives of different sections of the law as my main measures. By studying these documents and comparing them to the enacted law, I was able to compare the justifications and objectives for different provisions in CTEA and how much they promote knowledge creation and learning. I was looking for provisions that helped the process of knowledge creation or enabled authors and scholars to earn credits. I also looked for motivations and rationales presented by the members of the Congress and other witnesses who testified during the congressional hearing sessions in support or in opposition to extending copyright term. I explored other issues and topics that did not necessarily promote knowledge creation at the hearing sessions to understand the core topics of the debates. I analyzed the discourse of different interest groups and how they influenced the legislative process and whose argument during congressional hearings became the law.

_Data Collection and Analysis_

Congressional hearings and floor debates related to this research are public information and accessible through the Library of Congress and Federal Digital System, I accessed and downloaded them to conduct my analysis.\(^{47}\) I used qualitative analytical software package QSR NVivo 10 to code and analyze the content of the debates and hearings. I stored and organized the documents in folders for future access, then coded and analyzed the content of the debates and hearings to capture the purpose of the law and the reasoning behind important provisions

of the law. In the next step, I imported them into QSR NVIVO for organization. I carefully coded paragraphs and developed memos. Finally, I connected my memos and developed themes to analyze to what extent the phenomena of knowledge creation and learning were discussed during the floor debates and congressional hearings before the enactment of the current copyright law and that was ultimately formulated into the law.

Creswell defines six general steps for analyzing qualitative data. These steps include data collection, preparation, review and reading, coding, description, and developing themes. Figure 1 visualizes these steps. I followed these steps to develop the themes of my research.

Figure 2-1: The Qualitative Process of Data Analysis

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48 I used qualitative analytical software packages like QSR NVivo to code and analyze the content of the debates and hearings.
Agent Based Modeling

Determining the impact of the current copyright law on knowledge creation is a complex problem both conceptually and empirically. It is very challenging to assess its impact in real life and compare it to an alternative copyright law while the current law is the only binding law. Historical comparison is also not very helpful, because the Internet and the information technology revolution in the 21st century have significantly influenced knowledge creation. Research and scholarly work is significantly more collaborative and dependent on shared information. The change makes the comparison of the scholarly work in the 21st century to 20th and 19th centuries very challenging. In this context, using Agent Based Modeling (ABM) to assess this impact becomes quite relevant.

The use of mathematical models to explain phenomena in various disciplines is common. Many early models of complex systems used strong mathematical idealizations that enabled the use of mathematical tools such as differential calculus. However, these idealizations limited the scope of these models. Computer simulations removed some of these barriers and allowed scholars to model more complex problems. ABM often uses computer simulations as a tool to study complex problems.\(^{50}\) Using ABM, we can study the behavior of individuals and their interactions with each other and their environment. Individuals, who are defined as "Agents" in ABM, can be institutions, business units, humans, animals, or many other possible objects of study. Using ABM, we can study how change in environment can impact the behavior of agents and how agents' behavior and their relations with other agents can impact the whole system.\(^{51}\) The interaction of the agents and with the environment makes ABM models even more interesting.\(^{52}\)

\(^{50}\) Agent based models have been adopted in ecology and especially in modeling foraging behavior of animals. Many interesting and inspiring models have been developed using ABM technique. I have listed key papers that helped me design my model in bibliography section.


\(^{52}\) The interaction of agents and their environment frequently happens in animal foraging models. Anderson designs the environment as prey, predators and habitats. The interaction of agents with the environment has short-term, mid-term and long-term impact on decision making of the animal.
All these features are quite relevant in modeling the knowledge creation environment and the interaction of scholars in conducting research and publishing papers. Nicholas Payette in an overview of ABM in science compiled the common characteristics of ABM from other studies:

- **Heterogeneity:** agents in the model are not homogeneous and can differ from each other in many ways. Agents have static characteristics that remain unchanged during the simulation and dynamic ones that are updated. Moreover, external properties control the relation between an agent, its environment and other agents.

- **Autonomy:** Agents have the autonomy to follow policies or not.

- **Space:** Agents are placed in an environment. The environment can be a physical place such as an ecosystem or non-physical environment such as a world of ideas.

- **Local interaction:** Agents usually interact with their neighbors, which is specified by the space, receive information and learn from them. These neighbors can be students or other scholars in an epistemic landscape.

- **Bounded rationality:** This characteristic states that agents do not have global information and do not have infinite computational power. They make use of simple rules based on local information.

Agent Based Modeling gives us the opportunity to analyze what happens in a complex system, by changing variables in the model when financial, time, physical and social constraints prevent conducting real experiments. It allows us to set up models that are sufficiently close to real

Beauchamp designs his model to study Producer-Scrounger game and Ideal Free Distribution game in which animals forage in different types of habitats: James Anderson, "AN AGENT-BASED EVENT DRIVEN FORAGING MODEL." *Natural Resource Modeling* 15, no. 1 (2002): 55-82.


systems, so we can study the system and foresee what scenarios might happen in the real case.\textsuperscript{55} Lazer and Friedman lay out four critical criteria for simulated-based research: First, the model has to be a representation of the real world. Second, the model should be robust and simple enough so we can assess the robustness. Idealizations, despite being useful in modeling, can damage the robustness the model in some cases.\textsuperscript{56} Third, the model should be fully replicable. Fourth, the simulation should produce non-obvious and non-trivial outcomes.\textsuperscript{57}

Although the field is still far from maturity, scholars have studied the creation of new science using computer simulations and ABM. In one of the earlier studies in this field, Gilbert designed a fairly simple model to simulate the creation of scientific papers. He introduced the concept of “kene,” synonymous to the concept “genes”, which carries the information of the paper, and each paper represents a new quantum of knowledge. In his model, the kene of a newly produced paper is a function of the cited papers. After running the simulation, Gilbert argued that the generation of new papers happen according to Lotka’s Law in which “for scientists publishing in journals, the number of authors is inversely proportional to the square of the number of papers


\textsuperscript{56} Weisberg and Muldoon examined the robustness of Kitcher and Streven’s Model and argue that the idealization of the model resulted in non-robust conclusion in the model. See: Ryan Muldoon, and Michael Weisberg. "Robustness and idealization in models of cognitive labor." \textit{Synthese} 183, no. 2 (2011): 161-174.

published by those authors."

In Gilbert’s model, scientists and scholars do not play an active role. They are assigned to papers. In more recent models Zollman, Weisberg & Muldoon, Alexander, Himmelreich & Thompson and Grim separately designed different models where scholars seek truth in an epistemic landscape. Weisberg and Muldoon look at the division of cognitive labors in epistemic landscape to study the impact of division in finding the truth as quickly as possible. They employ a three-dimensional landscape where agents look for the highest locations in the landscape that is representative of the truth. Grim uses a similar three-dimensional epistemic landscape and applies it to various network models like those in Zollman’s work.

It is certainly desirable to maximize knowledge production in the society. Having a robust and realistic model of how the scientific system works would allow us to test the effect of potential policies before actually applying them. Knowledge maximization can be conceived in terms of maximization of truth within a society. Alvin Goldman and Moshe Shaked in their economic model define utility as professional success and they assume authors, scholars and scientists maximize utility i.e. advance their professional interests. They argue that there is little or no incompatibility between the goal of professional success and truth acquisition. They also show that in some cases these two goals are positively related. Scholars and researchers are interested in earning credits. These credits translate into better job opportunities, more recognition in the society and more wealth. Therefore, it is safe to conclude that if we have

60 Weisberg and Muldoon, "Epistemic Landscapes", 239.
policies in place which help scholars to earn more credits through their research and publications, such policies promote knowledge creation in the society.\textsuperscript{63}

The topic of discussion in this part of the dissertation is how the length of copyright term contributes to the increase of the total credit earned by scholars. Was it a good decision to pass CTEA in terms of knowledge creation? Specifically, I am narrowing the discussion by focusing on the creation of journal articles in a scientific discipline. I focus here on the impact of copyright law on the total credits earned in the scholarly society and how fast the knowledge is produced. The reason that I am focusing on journal articles is that a large portion of the new knowledge is produced in the form of journal articles.

A Lattice is a perfect choice of network for my research project. It is very simple and uniform network. We can figure out what is happening in the model visually. Moreover, it nicely simulates clusters of knowledge. If topic A is similar to topic B and Topic B is similar to topic C then A and C are not radically different. A lattice properly represents this relationship. I call this lattice an \textit{Epistemic Plane}. The concept of an epistemic plane is related to, but importantly distinct from, that of an \textit{epistemic landscape}.\textsuperscript{64} Epistemic landscapes represent an area of possible attitudes toward a given topic, some of which are more valuable than others. The boundaries of epistemic landscape are determined by the topic, the coordinates of the landscape correspond to approaches, and the height represents the epistemic significance of the particular approach. An epistemic plane, on the other hand, treats all locations as having equal epistemic worth. Its boundaries delineate a field and its points denote particular topics. The patches on the epistemic plan represent quanta of knowledge or ideas that are either discovered or undiscovered. In my model, green patches represent discovered knowledge i.e. published papers

\textsuperscript{63} I make this conclusion assuming the earning of credits is not a zero-sum game.
and gray patches represent undiscovered knowledge. Green patches have an attribute that stores the access level to the paper. There are three levels of access: \{0,1,2\}. Zero represents open access and those articles that belong to public domain, which will be in gray. See figure 2-1.

Figure 2-2: Epistemic Plan

For copyrighted articles, I define two levels of access to differentiate between copyrighted articles with lower (light green) and higher (dark green) price tags. Access level 1 papers are more affordable (light green) than access level 2 articles (dark green). The idea is to simulate the fact that scholars in more prestigious academic institutions have access to more published articles. Copyright law creates monopoly for the right owner and published articles are not uniformly available to all scholars. Each green patch stores the period in which the paper is published or simply when the color changes from gray to green into the publication period attribute. This is important because copyright expires after copyright term is fulfilled. This attribute enables us to pass the work to public domain after copyright is expired. It also stores the author, citing agents, and agents who read the paper. Patches that are within the same proximity are conceptually similar.

Agents in my model represent scholars. Each agent has a set that identifies which articles they publish. Agents also have a second set of cited articles similar to published articles. This set
represents articles that the agent has read and cited in new papers they publish. As we saw in the literature, scholars would like to increase their credits. Therefore, the more they publish and their articles are cited, the more they can collect credits. Each agent has an access level that dictates to which articles the agent has access. Access levels belong to the set \{0,1,2\} similar to access levels in papers (green patches). An agent with an access level two (black agents) can read all papers. Someone with an access level zero (blue agents) can only find open access articles and finally the access level 1 (red agents) makes level one and level zero articles available to the agent. Each scholar has access to her own published articles. The access level simulates different academic institutions in the scholarly world. Higher number means the author is a member of a university with more library resources and consequently higher level of access to published articles.

Agents tend to publish papers with different access levels depending on their publishing habits. For instance, agents with publishing habit type “a” only publish articles that are open access. The publishing behavior can help us identify how much authors can expedite the discovery of knowledge even under the strictest copyright laws by changing their publishing behaviors. The assignment of publishing habits will be random at first, but in a complete model, I will introduce publishing strategies that are designed based on the credit seeking habit of scholars.

In summary, each agent has the following attributes: Set of Publications, Set of Read Articles, Set of Cited Articles, Set of Citing Articles, Publishing Habit Type, Access Level, Total credits earned
The following steps happen in the initialization phase of the model:

- Set the ideas landscape (default 51*51 patches.)
- Set the color of the patches.
- Assign 0 as the publication period to all green patches.
- Randomly assign access levels to each green patch from the set \{0,1,2\}.
- Randomly locate all the agents somewhere on green patches, where the access level of the agent is equal or greater than the access level of the patch. More than one agent can be located on the same green patch.
- Set copyright term

Depending on the color of the patch on which they are located, agents do one of the following acts: “Read Paper” or “Publish.” If the patch is green, the agent reads the paper and adds it to her set of read articles. If the patch is gray, the agent publishes the article. The patch then becomes green and it is added to the set of published articles of the agent. Moreover, any read articles in the neighborhood of the newly published paper are added to the sets of citing articles of the agent who reads them.\(^6\) It is also added to the cited articles of the agents who published the article.

The agent, in the next time cycle, selects a patch in the defined neighborhood. If the patch is green and accessible, i.e., its access level is equal to or lower than the access level of the agent, and she has not read it already, then the agent moves to the new green patch. The selection of the green patches is done based on the reading strategy that is set in the initialization phase. Reading Strategy can be selected from one of the following strategies: “the closest”, “most recent”, “most cited”, “article from a scholar with the highest number of publications”, “most read” and “random”. If the patch is gray and the agent has already read at least the minimum required articles in the neighborhood, then she moves to the gray patch. If all of the patches in the neighborhood of the current location are inaccessible, then the agent moves to a green patch outside neighborhood to which she has access according to the reading strategy.

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\(^6\) The radius of the neighborhood and the minimum number of read articles required to publish are given as parameters in the model.
continue the above two actions i.e. Read/Publish and Move, until all the patches in the model become green.

The access level of the green patches that are in the world longer than copyright term, become zero. These articles will become part of public domain. Authors will receive credits when their papers are cited or when they publish new papers.

This model allows us to study the impact of copyright term length on the total credits generated in the model. The model lets us study the rate of knowledge discovery under various copyright term lengths and come up with recommendations in adjusting the length of copyright term that maximizes credit and the velocity of knowledge discovery. I used NetLogo\textsuperscript{66}, multi-agent modeling environment, as a platform in which I built my model and ran simulations. I exported the results of my simulations to Excel files and summarized into pivot tables and graphs.

\textsuperscript{66} NetLogo, \url{https://ccl.northwestern.edu/netlogo/} (accessed on 3/2/2018).
Copyright legislation, according to the Constitution, is designed to promote the progress of knowledge and learning in the society. In this qualitative research, I analyzed the hearing sessions, floor debates and the landmark case related to the most recent copyright extension act i.e. CTEA\textsuperscript{67} to understand how much the phenomenon of knowledge creation and learning were discussed and formulated into the law.

Copyright term has been extended significantly since its inception. The most recent extension to copyright law was enacted in 1998 in which Congress increased copyright protection to seventy years after the death of the author. If the work is a “work for hire”, the work under copyright is protected for 120 years after creation or 95 years after publication whichever is shorter.\textsuperscript{68}

In October 1993, the European Union adopted a law that extended the term of copyright protection for works created in its member countries to life plus 70 years, a 20 year increase in protection. The extension of copyright term in Europe was the main motivation of the proponents of CTEA. Proponents of extending the copyright term argued that the U.S. as the world leader in production of copyrighted materials must be ahead of Europe and other nations in protecting the intellectual properties of American citizens. I found two major themes in supporting copyright term extension in the discourse studied in the scope of this project: macroeconomic and microeconomic impacts of the term extension. The macroeconomic rationale was an appealing argument to the members of Congress as it connected the passage of copyright extension to the improvement of the U.S. economy, job creation, and creating trade surplus for the nation. As a microeconomic rationale, the supporters framed copyright extension as a fairness issue to American right holders who would lose the economic fruits of their intellectual properties to European countries due to the rule of shorter term. I did not find any direct reference to promoting knowledge creation as a rationale or motive to ask for extending

\textsuperscript{67}Copyright Term Extension Act 1998, S. 505, 105\textsuperscript{th} Cong.

\textsuperscript{68}Copyright Law of the United States, U.S., §302
copyright term in the discourse of congressional hearings and floor debates. On the contrary, the Registrar of Copyright acknowledged the negative impact of the law on libraries and the availability of copyrighted materials to the scientific world. The Registrar subsequently made recommendations for a few exemptions for libraries.

Analysis

To achieve the above goal, I analyzed three set of documents: Congressional Hearings, Floor Debates, and the landmark Eldred v. Ashcroft Supreme Court Case.

**Congressional Hearings**

During the hearing sessions convened prior to enacting Copyright Term Extension Act of 1998, subcommittees within the House of Representatives and the Senate called 65 witnesses across 24 panels to present their points of views on the extension of copyright term as well as other provisions proposed in the bills. Some of the organizations, institutions, and government bodies appeared more than once in front of different sub-committees. For example, the Registrar of Copyright Office participated in three separate panels as a witness. The majority of discourse happened between three main industry players: entertainment, commerce, and government comprised a total of 78% of witnesses (see Figure 3-1).
The music industry had a significant presence during the hearing sessions and uniformly argued for the extension of copyright term. The players in the entertainment sectors were mainly from music industry (34% out of 45%). Other interest groups included restaurant and tavern owners, events and exhibition providers, specialty radios, and educators. Most of the witnesses in commerce category are restaurant, bar, and tavern owners (12% out of 18%) (see Figure 3-2). These groups asked for music licensing fee exemptions and for Congress to require music societies to be more transparent in their licensing practices. Only two out of 24 panels were allocated to witnesses who opposed the extension of copyright term. Those panels included representatives who were experts in the area of copyright law and professors of intellectual property who argued against the extension.
Congressional hearing witnesses

**U.S. Copyright Office.** Congress created the U.S. Copyright Office and the position of Register of Copyrights in 1897 within the Library of Congress. With over 400 employees, the Copyright Office examines and registers copyright claims. In fiscal year 2014, the Office processed more than 476,000 registration claims. Congress has given responsibility to the Copyright Office to conduct studies and programs regarding copyright laws, as well as provide information and assistance to federal departments and agencies and the judiciary on issues related to copyright laws. More importantly, the Copyright Office advises Congress on issues related to copyright and proposes changes to the law. Marybeth Peters, who was the Registrar of

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Copyrights during the years in which Congress conducted the hearing sessions that resulted in the enactment of CTEA, was invited to three congressional hearing sessions.

In 1995, the subcommittee on Courts and Intellectual Property of the House of Representatives invited Ms. Peters to present the view of Copyright Office on Copyright Term Extension Act of 1995. The Copyright Office supported H.R. 989 to extend the term of copyright for two main reasons: 1) to provide the same protection that EU offered to its copyright holders so that U.S. copyright owners receive the same financial benefits as their European counterparts, and 2) the U.S., as a leading creator of copyrighted works, should not wait until it is forced to increase the term; rather it should set the example for other countries. In supporting H.R. 989, the Copyright Office raised its concern, however, regarding the effect of the extension on libraries, archives, and educational institutions who are striving to improve American education and who serve as the guardian of the nation’s cultural heritage. It recommended striking the additional 10 years of protection to unpublished works to balance the rights of copyright owners with the benefits to be gained by the public. In her statement, Marybeth Peters acknowledged that it is difficult to see how moving from a term of life-plus-50 to life-plus-70 would encourage more authors to write. She added it could, however, provide additional income that would finance the production and publication of new works.

The Copyright Office reiterated this position during the hearing session that the committee on the judiciary at the Senate held to discuss the Copyright Term Extension Act of 1995. Ms. Peters expressed her support of S. 483 largely on the grounds of harmonizing monetary benefits of copyrighted materials with European countries and to providing the same level of protection to U.S. copyright owners.

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70 Copyright Term Extension Act of 1995, H.R. 989, 104th Congress.
71 Copyright Term Extension Act of 1995, S. 483, 104th Congress.
In July 1997, Marybeth Peters returned to the subcommittee on Courts and Intellectual Property of House of Representatives to testify on the Fairness and Music Licensing Act.\(^2\) The proposed H.R. 789 provided exemptions to small businesses from fee payments to performing rights societies for radio and TV performances if the performance of the music is incidental to the main purpose of the establishment. The Copyright Office argued that the proposed bill would go beyond small exemptions by the definition of the Berne Convention, and as a result, could violate the standards of the Berne convention.

**Department of Commerce – U.S. Patent and Trademark Office (USPTO).** USPTO is the federal agency that grants U.S. patents and registering trademarks. The office fulfills the mandate of Article I, Section 8, Clause 8 of the Constitution that the legislative branch “promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Rights to their respective Writings and Discoveries.” The agency advises the President, the Secretary of Commerce, and Congress on intellectual property policy, protection, and enforcement.

On behalf of USPTO, Bruce Lehman, the Assistant Secretary and Commissioner of Patents and Trademarks attended three hearing sessions that resulted in enactment of Copyright Term Extension Act. USPTO supported the extension of copyright term as a means to harmonize copyright law with European Union and provide the same level of financial benefits to U.S. copyright owners as Europeans. In 1995, at the hearing held by the subcommittee on Courts and Intellectual Property of House of Representatives, Bruce Lehman argued that the extension of copyright protection would provide the needed funds to commercial enterprises which fund almost all commercial creation of creativity in the United States to invest in new creative works. The commissioner downplayed the negative impacts of the term extension on the public domain and argued “there is very little evidence, for example, that the consumer pays a great deal less

\(^2\) The Fairness in Musical Licensing Act of 1995, H.R. 789, 104th Congress.
for published works, which are in the public domain, versus published works which are copyrighted. If you go to a bookstore, the prices tend to be comparable. So in our view, there is relatively little downside to this legislation and it will definitely provide additional revenue for one of America’s fastest growing industries.\footnote{U.S. Congress, House of Representative, Committee on the Judiciary, Copyright Term, Film Labeling, and Film Preservation Legislation: Hearing before the Subcommittee on Courts and Intellectual Property, 104th Congress, HRG-1995-HJH-0049, 1995, 213.} USPTO joined the Copyright Office in opposing H.R. 789, the Fairness and Music Licensing Act. Robert Stoll, USPTA Administrator, on behalf of Bruce Lehman, argued that the passage of H.R. 789 would put U.S. at odds with its trading partners and would create inconsistency with Berne Convention.

**Music Industry.** Organizations, companies, and societies connected to music industry were invited to testify during the hearing sessions held by the House of Representatives and the Senate focusing on copyright term extension act. Without exception, in all six hearing sessions, music industry had witnesses who fully supported the copyright extension act. These include:

- American Society for Composer, Authors and Publishers (ASCAP): With more than half a million US composers, songwriters, lyricists, and music publishers, ASCAP attempts to protect the rights of its members by licensing and distributing royalties.
- Broadcast Music Inc. (BMI): BMI collects license fees on behalf of songwriters, composers, and music publishers and distributes them as royalties to its members.
- SESAC: Like its sister organizations ASCAP and BMI, SESAC collects royalties for its members. Compared to BMI and ASCAP, its membership pool is significantly smaller.
- AmSong Inc: AmSong was a California based corporation dedicated to the protection of musical copyrights and advocate for songwriters and their heirs. It was formed in 1994 with the specific and immediate goal of urging Congress to extend the term of copyright in the U.S. The corporation was dependent on its members’ contributions to pursue its
missions.74 While the company is still actively registered, I could not find any website nor any recent online presence.

- Nashville Songwriters Association International (NSAI): NSIA is a not-for-profit songwriters trade association that protects the rights of professional songwriters.
- Songwriters Guild of America (SGA): Like NSAI, SGA is an advocate of songwriters and their rights.
- National Music Publishers’ Association (NMPA): NMPA represents all American music publishers and is an advocate for those publishers. Its goal is to protect the property rights of music publishers on the legislative, litigation, and regulatory fronts.

The music industry strongly supported the extension of copyright term for the right owners and argued against providing any music licensing fee exemptions to other businesses such as restaurant and tavern owners.

**Motion Picture Industry.** Motion picture industry was well represented during the hearing sessions related to copyright term extension act. Below is the list of the players from motion picture industry that attended hearing sessions:

- Motion Picture Association of America (MPAA): MPAA is an advocacy organization that protects the copyright of the motion picture and television industry. MPAA was founded in 1922 by William Hays. The organization adopted a self-censorship system known as the Hays Code to screen and censor “offensive materials” and prevent government from influencing filmmaking. During the 1960s the Hays Code was removed from MPAA’s mission.75 Chris Dodd is the current CEO and Chairman of MPAA. He was a Senator

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during the passage of CTEA and testified in support of CTEA during the “Copyright Term Extension Act of 1995” hearing session on Sep 20 1995.

- Motion Picture Association (MPA): MPA is the international counterpart of MPAA which represents the interest of six international producers and distributors of filmed entertainment by protecting the intellectual property rights of those companies.

- Writers Guild of America, (East and West Divisions): This labor union represents TV and film writers. The union negotiate contracts and protects the intellectual property rights of its members.

- Directors Guild of America (DGA): DGA is a labor organization that represents movie directors and directorial teams working in motion picture industry.

Motion Picture Association, Directors Guild, and Writers Guild of America joined the music industry in support of copyright term extension act. Among the players from motion pictures industry, Writers Guild of America joined Professor Jerome Reichman from Vanderbilt School of Law to ask for the extension of copyright law specifically for creators instead of right owners.

**Food and Beverage Businesses; Lodging Industry; Events and Exhibition Providers.** The food and beverage businesses came to the hearing sessions along with representatives from events providers and the lodging industry to argue for exemptions from music licensing fees. This coalition saw a window of opportunity\(^\text{76}\) to lobby and draft a bill\(^\text{77}\) requiring music licensing fee societies to be more transparent. Through the bill, the coalition proposed exemption for incidental use of music for small business settings. This coalition did not directly speak against the extension of copyright term and focused on targeted demands to ease the financial burdens on small businesses. The coalition had few champions in Congress, including Congressman Sensenbrenner.\(^\text{78}\) The coalition successfully negotiated an amendment

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\(^{77}\) Fairness in Music Licensing Act, H.R. 789, 104\(^{th}\) Cong.  
\(^{78}\) Congressman Sensenbrenner introduced H.R. 789 in the Committee on Small Business of the House of Representatives seeking exemptions for small business establishments to play music over radios and TVs.
to waive music licensing fee for small businesses. Below is the list of witnesses from this coalition:

- **National Licensed Beverage Association (NLBA):** The association represented beverage licensees in three tiers of producers, distributors and retailers. Most members were locally owned stores and bars. In 2002, the NLBA and the National Association of Beverage Retailers merged to form the American Beverage Licensees.

- **National Restaurant Association (NRA):** The association represents restaurant businesses on issues related to their growth and success, by protecting the members’ economic interests and sharing best practices.

- **Restaurant owners:** Individual restaurant owners (Greenbaum & Gilhooley’s Restaurant, Last Call Saloon, Publick House Restaurant, Tavern League of Wisconsin) attended hearing sessions as witnesses to speak to the impact of music licensing fees on their small businesses.

- **New Hampshire Lodging and Restaurant Association:** The statewide trade association representing business interests for the hospitality and tourism industry in New Hampshire. The owner of Balsams Grand Hotel, Silo Inn spoke on behalf of the association at the hearing.

- **American Society of Association Executives (ASAE):** Representing trade associations and individual association executives, ASAE helps its members by engaging in advocacy activities influencing policymaking, building and sharing knowledge, and enabling learning.

- **International Association of Auditorium Managers (IAAM):** The association represents public assembly venues such as auditoriums, arenas, convention centers, exhibit halls, stadiums, performing arts centers, university complexes and amphitheaters. The association name was later changed to International Association of Venue Managers (IAVM).
Consumer Electronics Manufacturers Association (CEMA): CEMA advocates for the entrepreneurs, technologists, and innovators who shape the consumer technology industry. The Association’s name was changed to Consumer Technology Association (CTA) in November 2015. The association operates several trade shows including the world’s largest the consumer electronics show (CES) held every year in Las Vegas.

Tulsa Convention Center: Located in Tulsa OK, Tulsa Convention Center is a facility owned and operated under the municipality of the city of Tulsa.

**Department of Justice – Antitrust Division.** The Antitrust Division of DOJ is responsible for enforcing the antitrust laws of the U.S. and protecting economic freedom and opportunity by promoting free and fair competition in the marketplace. The Division provides guidance to the business community on antitrust laws.

On May 8, 1996, the House Committee on Small Businesses invited Charles Rule, former Assistant Attorney for Antitrust Division to the hearing session on music licensing and small businesses to give his opinion on the Fairness and Music Licensing Act.\(^{79}\). Mr. Rule did not represent the DOJ-Antitrust Division. However, he was consulted as an antitrust expert to analyze ASCAP and BMI from antitrust perspective and weigh in on H.R. 789. He argued that clearinghouses like ASCAP and BMI are necessary mechanisms for copyright owners to negotiate thousands of individual licenses and get a return on their investments. He stated that the question of establishing licensing fees is a political question that should better be answered by the Congress.

**Trade Association for Home Video Entertainment.** Jeffery Eves, President for Video Software Dealers Association (VSDA) testified at the Subcommittee on Courts and Intellectual Property – House of Representatives on June 1, 1995. VSDA was a non-for-profit international trade association for the home entertainment industry in the US and globally that later merged

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\(^{79}\) The Fairness in Musical Licensing Act of 1995, H.R. 789, 104th Congress.
with Interactive Entertainment Merchant Association (IEMA) to form Entertainment Merchant Association (EMA). The hearing session Eves attended was dedicated to discussing three bills: H.R. 989, Copyright Term; H.R. 1248 Film Labeling, and H.R. 1734, Film Preservation. Under the proposed H.R. 1248, if an artistic author objected to any alteration of the copyrighted material, the distributor would be required to note the objection in a signboard warning. Jeffrey Eves testified in opposition to the bill and argued that H.R. 1248 was unnecessary and a “Government intrusion into a marketplace that is working successfully for the industry and for the customer.” The bill ultimately died and did not get to the floor for debate.

**Association of Moving Image Archivists.** The Association of Moving Image Archivists (AMIA), a nonprofit international association, was established to preserve moving image media. The association is a venue to exchange information and promote collaboration among its members and to host workshops on preserving motion pictures. AMIA take actions on matters affecting archiving moving images. Edward Richmond, President of Association of Moving Image Archivists spoke in support of the National Film Preservation Act of 1995 to reauthorize the National Film Preservation Board in the Library of Congress to continue the protection and preservation of America’s motion picture heritage.

**Specialty Radios.** Associations and coalitions representing specialty radio stations, such as religious and Hispanic radios, participated in hearing sessions to negotiate music-licensing fees and to receive waivers from performance rights organizations.

- National Religious Broadcasters Music License Committee (NRBMLC): The focus of the committee is to serve its member radio stations in negotiating fair and nondiscriminatory music licenses with the performance rights organizations such as ASCAP, BMI and SESAC. NRBMLC also assists its members with license compliance.

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80 U.S. Congress, House of Representative, *Copyright Term, Film Labeling, and Film Preservation Legislation*, 114.
81 The National Film Preservation Act of 1995, H.R. 1734, 104th Congress.
issues and questions. The general manager of WGMS-FM, WASHINGTON, D.C. and the CEO of Salem Communications Corp represented NRBMLC at the hearings.

- American Hispanic-Owned Radio Association (AHORA): AHORA was established in 1991 to serve 55 Hispanic station owners. The President of KABQ Radio Station represented the association at the hearings. AHORA is no longer an active association.

- Coalition for the Protection of America’s Gospel Music Heritage: The coalition was a grassroots movement made up of Christian songwriters and publishers. Robert Sterling, the President of the coalition testified on behalf of Christian songwriters and publishers in opposition to blanket music license requirements imposed on religious radio stations. The coalition is no longer active.

Specialty Education. Concerned about performance right organizations actions in imposing licensing fees, this interest group provided testimony at the hearing sessions to negotiate waiver for specialty education organizations and companies in copyrighted music.

- Thelma Showman School of Dance: Thelma Showman established her school of dance in 1951 in Broken Arrow, Oakland. Thelma Showman died at 99 in 2015. Her dance school is still active.

- American Choral Directors Association (ACDA): Founded in 1959, ACDA is a nonprofit music-education organization with the purpose of advancing choral music. ACDA participates in advocacy for choral music.

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Academia. Few members of academic community, and specifically university professors in the field of copyright law, were called to give testimony regarding copyright extension bills under consideration in the House and the Senate. The members of academia expressed concerns about extending copyright term and advised against the extension of the term.

- William Patry, Yeshiva University – Benjamin N. Cardozo College of Law: Professor Patry served as a copyright counsel to the U.S. House of Representatives in the early 1990s. He also worked as a policy planning advisor to the Register of Copyrights. He is currently a Senior Copyright Counsel at Google.

- Jerome Reichman, Bunyan S. Womble Professor of Law at Duke Law School: Professor Reichman has published books and journal articles in the field of intellectual property law. Some of his articles addressed the problems that developing countries face in implementing the World Trade Organization’s Agreement on trade related aspects of IP rights. Professor Reichman serves as special advisor to the United States National Academies and the International Council for Science (ICSU) on the subject of legal protection for databases. He was a professor of law at Vanderbilt University when he testified at the hearing for copyright extension.

- Dennis Karjala, Jack E. Brown Chair and Professor of Law – Arizona State University: Professor Karjala is internationally recognized in the area of copyright law. He was a Fulbright Senior Research Scholar at Max Plank Institute in Munich, a Fulbright Teaching Fellow at the University of Hokkaido and a Japan Foundation Fellow at the University of Tokyo.

- Peter Jaszi, American University, Washington College of Law: Professor Jaszi is the Director of Glushko-Samuelson IP Law Clinic. He is an author of a standard copyright textbook. In 1994, he was a member of the Librarian of Congress’ Advisory Commission on Copyright Registration and Deposit. In 2007, he received the American Library
Association’s L. Ray Patterson Copyright Award, and in 2009 the Intellectual Property Section of the District of Columbia Bar honored him as the year’s Champion of Intellectual Property.

- John Belton, Rutgers University: Professor Belton teaches English and Film. He served as a member of the National Film Preservation Board (1989-1996) and chaired the Archival Papers and Historical Committee of the Society of Motion Pictures and Television Engineers (1985-1996). He testified at the hearings representing the Society for Cinema Studies.

Review of the hearing sessions

Congress held six hearing sessions to collect feedback regarding copyright term extension and other related matters. Table 1 summarizes these hearing sessions.
### Table 3-1: The summary of congressional hearing sessions related to Copyright Term Extension Act.

<table>
<thead>
<tr>
<th>Hearing ID</th>
<th>Title</th>
<th>Hearing Date</th>
<th>Bill #</th>
<th>Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRG-1997-HJH-0058</td>
<td>Pre-1978 Distribution of Recordings Containing Musical Compositions; Copyright Term Extension; and Copyright Per Program Licenses</td>
<td>Jun. 27, 1997</td>
<td>139p</td>
<td>Subcommittee on Courts and Intellectual Property, Committee on the Judiciary. House</td>
</tr>
</tbody>
</table>
Hearing 1. Music Licensing Practices of Performing Rights Societies hearing\textsuperscript{83} convened on Feb. 23-24, 1994 by Subcommittee on Intellectual Property and Judicial Administration, Committee on the Judiciary in House of Representatives. The purpose of this hearing was to examine music licensing practices of performing rights societies, including American Society of Composers, Authors, and Publishers (ASCAP), Broadcast Music, Inc. (BMI), and Society of European State Authors and Composers (SESAC), under the Copyright Act of 1976. The hearing was also designed to evaluate the Public Accommodations Exception Act of 1993,\textsuperscript{84} to clarify the Copyright Act\textsuperscript{85} regarding licensing exemptions for small business. The purpose of Public Accommodations Exception Act was to ensure that restaurants, taverns, and other commercial food and drink establishments were not required to pay fees to performing rights societies for radio and TV performances if the performance of the music was incidental to the main purpose of the establishment and no direct charge was made to see or hear the transmission. In this hearing, representatives of music, food, venue and trade associations, and specialty radios argued for and against H.R.3288 and shared their points of views regarding music licensing practices in 6 panels.

During the two-day hearing, sixteen witnesses in six panels were called to discuss music licensing practices of performing rights societies under the Copyright Act of 1976. The panelists debated whether the performance of music was incidental to the main goal of restaurants and talked for and against H.R. 3288. Panelists consisted of American Society of Composers, Authors and Publishers, Broadcast Music Inc., Society of European Stage Authors and Composers, American Choral Directors Association, International Association of Auditorium Managers, American Society of Association Executives, National Religious Broadcasters, American Hispanic-Owned Radio Association, National Licensed Beverage Association and

\textsuperscript{84} The Public Accommodations Exception Act, H.R.3288, 103\textsuperscript{rd} Cong.
\textsuperscript{85} Copyright Act of 1976, §110
National Restaurant Association. The following word cloud roughly summarizes the 496-page hearing document.

Figure 3-3: Word cloud visualizing Music Licensing Practices of Performing Rights Societies hearing

Figure 3, the word cloud of Music Licensing Practices of Performing Rights Societies hearing, visualizes the frequency of various words used during the hearing. In the word cloud, words with highest frequency are presented with larger font size and are generally placed at the center of the visualization. The majority of the discussion in this hearing was dedicated to music and music licensing for small businesses. The dominant motivation of discussion was economic benefits for two main referenced groups i.e. small businesses and the entertainment sector.

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86 I used NVIVO software package to generate the word cloud. I included words with same stem such as sport and sporting in the same category of words.
87 I developed the word cloud for other hearing sessions. Considering they are qualitatively similar, I did not include them in the chapter avoiding redundancy.
Representatives of the retail hospitality in my State of Arizona and others around the country have discussed this issue with me. I believe it is time for Congress to amend the Copyright Act of 1976 to provide for a total exemption from licensing fees paid to performing rights societies for the radio and television equipment used in bars, restaurants, and other commercial establishments where food and drink are served provided and this is the most important item in the bill, Mr. Chairman the performance of this music is incidental to the main purpose of the establishment, and no direct charge is made to see or hear its transmission.

_Ed Pastor, Representative from the State of Arizona_

The music industry argued against the exemption requested by small business witnesses and demanded the maximum copyright protection possible for the copyright owners.

Mr. Chairman, despite all my years of involvement at ASCAP, I am still astonished when users come to Congress and ask that their use of our intellectual property should be free. They would never dream of asking Congress, for example, to force bakers to provide bread to restaurants for free. Music is no different just because our property is intangible.

_Morton Gould representing American Society of Composers, Authors and Publishers_

In contrast, witnesses from small business associations attempted to rationalize music license exemptions for small businesses.

The other thing I really liked was the analogy that they used in the presentation of the loaf of bread or the baker in bringing in your bread. Of course, I have a baker. He does bring in my bread, and I gladly and happily pay him for the bread, but I certainly wouldn't expect that after the baker left that in the door would walk a man who said that he had the rights to the recipe for the bread, and he expected to be paid also after the baker had already paid him for
the use of the recipe.

Joe Johnson, on behalf of National Licensed Beverage Association

Interest groups who argued for an exemption of music license fee for small businesses argued that organizations like ASCAP have created a monopoly that destroyed the bargaining power of other parties in negotiating fees. They also complained about the confusing, complicated, and non-transparent licensing structures that was imposed on users. Representatives of specialty radio stations raised objections against ASCAP and BMI practices. They argued that specialty musical stations, such as Spanish language radio stations and classical music channels, have limited use of copyrighted music in their programs and high license fees unfairly were imposed on these stations.

In our reports, we identified approximately 22 percent of our weighted hours as containing ASCAP music. When ASCAP sent our monthly music reports back, we discovered that they claimed 30 percent of our weighted hours contained ASCAP music. As a result, after all the efforts, we ended up paying more than 99 percent of the amount we would have paid under the blanket license as a per-program fee in 1992. I want to state that one more time 99 percent of the blanket license fee in 1992.

Catherine Meloy, the General Manager of WGMS Radio Station

I also observed a minor theme related to motivation in this hearing. An interest group that represented American Choral Directors asked for music license fee exemption for music teachers at American Choral Directors conventions. Education was the motivation of this group to receive exemption. This particular interest group was in support of paying composers and songwriters, but asked for exemption only for educational purposes.
We are concerned that our conventions and our music teachers are being pressured to buy licenses for their teaching product. We are told that this is no different from other organizations. But at our conventions, we are introducing music. It is our only opportunity, the only way we have, to introduce music to the other teachers of the United States.

... 

Are we going to levy a fee that the farmer must pay a license before he is eligible to drive the Chevrolet pickup? We can see no difference. You come to conventions to hear new music, to study music, and reading sessions, to know if you want to purchase it in order to teach it in your choir when you go back to your respective institution.

Dr. Leslie Gene Brooks, National Executive Director of American Choral Directors Association

This interest group did not receive the exemption in the final version of the bill. In the final version of the bill, Congress included an exemption for food service and drink establishments with particular definitions and under defined conditions.

**Hearing 2.** Copyright Term, Film Labeling, and Film Preservation Legislation\(^88\) convened on Jun. 1 and Jul. 13, 1995 by the Subcommittee on Courts and Intellectual Property, Committee on the Judiciary in House of Representatives

This hearing considered the Copyright Term Extension Act of 1995\(^89\), to extend the term of ownership of a copyrighted work from the life of the author plus 50 years to the life of the author plus 70 years.\(^90\) The bill was a response to European Union (EU) decision to adopt a directive mandating copyright terms protection equal to the life of the author plus 70 years for all works.

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\(^88\) U.S. Congress, House of Representative, *Copyright Term, Film Labeling, and Film Preservation Legislation*.

\(^89\) Copyright Term Extension Act of 1995, H.R. 989, 104\(^{th}\) Congress.

\(^90\) U.S. Congress, House of Representative, *Copyright Term, Film Labeling, and Film Preservation Legislation, 4-7.*
originating in the EU. The hearing also considered the Film Disclosure Act of 1995\textsuperscript{92} to amend the Lanham Act of 1946 to require that copyright owners place a label on motion pictures or video cassettes disclosing any substantive alterations made to the original film and indicating any objections by the director, screenwriter, or cinematographer to those alterations.\textsuperscript{93} Finally, the hearing session discussed the National Film Preservation Act of 1995\textsuperscript{94} to extend the implementation of the national film preservation plan by the Librarian of Congress. The Act reauthorized the National Film Preservation Board and established a foundation to raise funds to preserve films in public domain and films with educational purposes that were not preserved by commercial interest.\textsuperscript{95}

Congress invited seventeen witnesses in five panels to speak for and against the three mentioned bills. Three out of five panels were dedicated to parties from music and motion picture companies and organizations. One panel was dedicated to representatives of the Copyright Office and Department of Commerce and the last panel consisted of Intellectual Property and Cinema Studies Professors. The panel with representatives from academia expressed opposition against H.R. 989 and the extension of the copyright term arguing that the enactment of this legislation would impose substantial costs to the general public without supplying any public benefit. Denis Karjala, Professor of Law at Arizona State University, pointed to the maintenance of royalty revenues from a few works made in 1920s and 1930s by few corporations and not the heirs of authors as the main reason for the legislation. He argued the extension of copyright would transfer wealth from public to those companies. At the cost of the public, he added, many letters, manuscripts, forgotten films and music, and out of print books which could potentially be the source of new works would stay under copyright.

\textsuperscript{91} Ibid, 518-523.
\textsuperscript{92} Film Disclosure Act of 1995, H.R. 1248, 104 Congress.
\textsuperscript{93} U.S. Congress, House of Representative, \textit{Copyright Term, Film Labeling, and Film Preservation Legislation}, 8-23.
\textsuperscript{94} The National Film Preservation Act of 1995, H.R. 1734, 104\textsuperscript{th} Congress.
\textsuperscript{95} U.S. Congress, House of Representative, \textit{Copyright Term, Film Labeling, and Film Preservation Legislation}, 24-48.
The proposed extension would supply no additional incentives to the creation of new works and it, obviously, supplies no incentive to the creation of works already in existence. Moreover, the notion that copyright is supposed to be a welfare system to two generations of descendants has never been a part of American copyright philosophy, nor has anyone made any showing, in fact, that life plus 50 years is insufficient to sustain a revenue stream through two generations. In addition, so-called harmonization with European law would, in any event, not be achieved by this legislation, even with respect to length of term, much less with respect to other fundamental differences like moral rights and fair use. Nor is the so-called unequal treatment of U.S. copyright owners in Europe a ground for mimicking a bad European move that favors the owners of a few old, but economically valuable, copyrights over the interests of the general public.

Denis Karjala, Professor of Law, Arizona State University on Behalf of the U.S. Copyright and Intellectual Property Law Professors

Representatives of music and motion picture industries strongly supported the enactment of H.R. 989. The main argument for their support was economic benefits for heirs of copyright owners.

In closing, I would like to offer one final observation. In the period of consideration of the 1976 Act, Congress recognized that, with each day that passed, works were falling into the public domain. Some heirs would lose copyright protection forever, in part owing to the press of other legislative priorities.

Edward Murphy, President and CEO of National Music Publishers’ Association
Imagine for a moment how it would feel if your grandmother had left you an exquisite quilt of her own making and after a certain time government officials appeared at your door and said this quilt has been in your family long enough, now it belongs to the world. Yet that is exactly what happens to the things I make during my life.

*Michael Weller Representing Writers Guild of America, East*

Another major theme in support of the copyright extension was harmonization with European Copyright extension. The supporters listed conformity with the EU copyright law as one of the main reasons to extend the copyright term to life plus 70 years. The witnesses argued that without extending the copyright term, U.S. will lose revenue from copyrighted works to the European Union as U.S. copyrighted materials would be protected for 20 years fewer than EU works due to the Berne Convention rule of shorter term.96

Europe is already girding its economic loins. They have lengthened their copyright term to 70 years plus life of the author. The Europeans understand all too clearly what the marketplace is all about. And I think in that kind of audiovisual landscape, the United States has to match Europe.

*Jack Valenti, President and CEO, Motion Picture Association of America*

Two weeks ago, on July 1, 1995, the countries making up the European Union implemented a uniform term of copyright which is that of the life of the author plus 70 years, and as part of that process these countries have invoked the rule of the shorter term when determining the extent of copyright protection. ...This

96 The rule of the shorter term allows the member countries to limit the duration of copyright for foreign works to at most the copyright term granted in the origin country, if the copyright term is shorter in the origin country.
means that under the current laws songs such as "In the Heat of the Night," "In the Eyes of Love," both of which I wrote in 1967, will go out of copyright in 2042, while a song written in England, France, or Germany in the same year by an author of the same age as myself, 49, [laughter], will remain protected until 70 years after his death.

Quincy Jones, Songwriter and Member of AMSONG, INC.

The panel of academic witnesses rejected the argument that H.R. 989 would create harmony with EU Copyright law and enumerated reasons why the bill cannot make the U.S. copyright law more compatible with the EU law. The panel referenced provisions that make the two laws incompatible.

... the proposed legislation is not really aimed at harmonizing United States and European law. It would, for example, extend the copyright period for corporate “authors” to 95 years (or 120 years if the work is unpublished). The European Union, by contrast, now offers corporate authors, for countries recognizing corporate “authorship,” 70 years of protection, which is less than 75 years we currently offer such authors...

Denis Karjala, Professor of Law, Arizona State University on Behalf of the U.S. Copyright and Intellectual Property Law Professors

The proponents of the extension frequently mentioned “harmony with the EU Copyright law” as one of their main reasons for extending the copyright term in this hearing session as a way to increase revenue for American copyright owners and as matter of fairness to them. In other words, the main reason behind the harmonization always goes back to economic motives.
Once this directive is implemented, U.S. works will only be granted copyright protection for the shorter life plus 50-year term before falling into the public domain. The main reasons for this extension of term are fairness and economics. If the Congress does not extend to Americans the same copyright protection afforded their counterparts in Europe, American creators will have 20 years less protection than their European counterparts; 20 years during which Europeans will not be paying Americans for their copyrighted works. And whose works do Europeans buy more than any other country? Works of American artists. This would be harmful to the country and work a hardship on American creators.

Representative Carlos Moorhead – Chairman for Subcommittee on Courts and Intellectual Property

Some witnesses directly referenced economic incentives as the main reason to extend copyright term.

As you know, ASCAP exists to license the nondramatic public performances of copyrighted music written and owned by our more than 65,000 composer, lyricist, and music publisher members. We license music users and monitor, collect, and distribute royalties to our members. These royalties are the largest single source of income to songwriters and that is what enables us to work in our chosen field and create the music that enriches the culture and the economy of our country.

Marilyn Bergman, Songwriter, President and Chairman of the Board, American Society of Composers, Authors and Publishers

H.R. 989 is about one thing: property. It is about how soon after people like me have made what we make can the Government, by law, allow it to be taken from us. At the moment, they must wait only 50 years. It is a small thing to ask that we be allowed to keep
it in the family for another 20. It is a modest request. I urge you to grant it.

*Michal Weller, Play-writer, Screen-writer and Member, Writers Guild of America, East*

**Hearing 3.** Copyright Term Extension Act of 1995 hearing⁹⁷ was convened on Sep. 20, 1995 by Committee on the Judiciary in Senate. The Committee on the Judiciary in Senate conducted a hearing session on Copyright Term Extension Act of 1995 on September 20, 1995 discussing S. 483 Senate bill mainly with respect to the duration of copyright to extend the current U.S. copyright term for works created on or after Jan. 1, 1978, from life of the author plus 50 years after the author's death to life of the author plus 70 years. The hearing had two panels with six witnesses. The first panel consisted of the Registrar of the Copyright Office and representative of Commerce Department who supported S. 483 for the most part. The second panel consisted of music composers, songwriters, heirs of deceased composers and songwriters, representatives of motion picture industry and intellectual property (IP) law professors. In the second panel, IP law professors argued against the bill and the extension of the copyright term while other witnesses supported S. 483.

The key motive for extending the copyright term was the extension of the copyright term in Europe. The supporters of S. 483 referred to the Berne Convention, which is the primary driver of copyright for signatories, its reciprocity nature, and the rule of the shorter term found in it. According to the convention, signatory countries are obligated to protect the copyrighted works of other member countries for minimum terms offered in either of the countries. Because Europe recently extended its copyright term to life plus 70 years, the supporters of S. 483 argued that American copyright holders would not get the benefit of extension and their work

would be treated as public domain works after life plus 50 years in Europe.

The U.S. suffers greatly from this illegal duplication of our work. Why, then, should we sit back and allow European companies to legally profit from the use of our works, without paying us in return?

_Senator. Dianne Feinstein, from the State of California_

... while the Berne Convention, to which all of us are signatories, while the Berne Convention says life of the author plus 50, Mr. Chairman, any nation can extend their copyright, as did the European Union because they understand the ferocity of the marketplace and they are going to make darn sure their works are protected, that nation has no need, no requirement, no compulsion to protect another nation's work beyond the term of that nation. So if we go into Europe with a 70-year works for hire and they are operating on 70 years plus the life of the author, which is 95 to 100 years, we are at a distinct disadvantage, and revenues that would come back to the American copyright owner now are truncated and are diverted into European and other hands.

_Jack Valenti, President and CEO, Motion Picture Association of America_

The main motive to extend the copyright term was the extension of EU Copyright Law. As in previous hearings, the main rationale used was economic incentives for right holders and especially for the heirs of deceased copyright owners. The rationale presented by the supporters of copyright extension bill to back up the motive was explained as economic benefits that the copyright holders and the U.S. economy as a whole could gain from the extension internationally and domestically.
What we concede is that, if we don’t do this, we will basically be leaving increasingly a lot of dollars on the table for the U.S. economy that we will not be able to collect.

*Bruce A. Lehman, Assistant Secretary, and Commissioner, Patents and Trademarks, Department of Commerce*

... American creative works are the most globally popular, the most patronized, and the most sought after by cinema audiences, television and home video views, worldwide. Which is why U.S. movies/TV programs and home video are America's most wanted exports delivering back to our country more than $4 Billion in surplus balance of trade. Intellectual property, consisting of the core copyright industries, movies, TV programs, home video, books, musical recordings and computer software comprise almost 4% of the nation’s Gross Domestic Product, gather in some $45 Billion in revenues abroad, and has grown its employment at a rate four time faster than the annual rate of growth of the overall U.S. economy. Whatever shrinks that massive asset is not in America’s best interests. Which is why the United States Trade Representative has also endorsed the initiative.

*Jack Valenti, President and CEO, Motion Picture Association of America*

In addition to citing economic incentives for the U.S. Economy as a whole, the proponents of S. 483 argued the bill would secure rights for heirs of copyright owners including children and grandchildren of right holders.

Certainly one of the reasons why people exert themselves to earn money or acquire property is to leave a legacy to their children and grandchildren. Buildings, companies, farms, or other interests can stay in the family indefinitely. Only in intellectual property do we take the entire bundle of property rights from a
property owner at a certain time to give a legacy to the culture at large, regardless of the wishes of the owner or his or heirs. But in 18 years of working with artists on these issues, I have come to the conclusion that, like most property owners, the vast majority of authors expect their copyrights to be a potentially valuable resource to be passed on to their children and through them to the succeeding generation. I believe that they are reasonable in this expectation and that such a general expectation is what the Framers of the Constitution had in mind when they constrained the power of Congress to grant copyrights only with the very broad and flexible requirement that such rights be granted "for limited times."

_Senator Orrin G. Hatch, From the State of Utah_

During this hearing, Professor Peter Jaszi, one of six witnesses, spoke as an opponent of S. 483. He argued adding 20 years of protection for works made for hire would not create additional incentives to corporations to create new works. He defended the public domain protection as a way of supporting America’s genius. He argued that extending protection for the works already in public domain does not make an incentive to create new works. He claimed no rational business would make economic decisions about present investment based on the mere possibility of income 75 or 100 years in the future. Finally, he argued that the bill would not fulfill constitutional purpose of promoting science and useful arts. Professor Jaszi explained the differences between the European copyright law which is based on natural rights and the U.S. copyright law which is designed to achieve social benefits, an idea that is based on the conviction that “encouragement of individual’s effort by personal gain is the best way to advance the public welfare.” He advised Congress against making harmonization with the European copyright law because it was designed on fundamentally different values. Professor Jaszi argued the extension of copyright term may enhance the earning power of some domestic and international copyright

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owners but it would not enhance the overall competitiveness of American cultural industries. To the contrary, he added, “American books, movie, music and software industries have proved to be the most successful in the world because American copyright has been relatively more hospitable than many others to the creation of new works based on preexisting ones.”

**Hearing 4.** Music Licensing and Small Business hearing was convened on May 8, 1996 by the Committee on Small Business in the House of Representatives. The purpose of this hearing was to examine the impact on restaurants, taverns, and other smaller businesses of music licensing practices of performing rights societies, including ASCAP and BMI. It also considers the Fairness in Musical Licensing Act of 1995 to amend the Copyright Act of 1976 to revise music licensing rules, including provisions to exempt businesses from fee payments to performing rights societies for radio and TV performances if the performance of the music is incidental to the main purpose of the establishment and no direct charge is made to see or hear the transmission. H.R. 789 required performing rights societies to offer radio broadcasters a license fee structure that varies in proportion to the amount of music played.

The Committee on Small Businesses at House of Representatives called for this hearing and invited six witnesses in one panel from the Department of Justice – Antitrust Division, representatives from Lodging and Restaurant Association, ASCAP, BMI and specialty radios to give their opinions on antitrust issues related to music licensing as well as the matter of fairness of music licensing practices to restaurants and entertainment establishments. During the hearing session, the Fairness in Musical Licensing Act of 1995 was discussed and different parties provided their views. Particularly, the witnesses discussed performing rights societies’

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99 Ibid 77.
efforts to enter into agreements with the National Licensed Beverage Association and the National Restaurant Association under which smaller restaurants and taverns would be exempted from certain radio and TV music licensing requirements. The witnesses also discussed the provision of H.R. 789 in which the transmission of religious services or recordings of copies of those services were regarded as not copyright infringement.

The core motivation seen in this hearing session was economic and financial benefits that the producers of copyrighted materials and, more specifically, stakeholders within the music industry would gain or lose to restaurant owners and entertainment establishments, as well as specialty and religious radios. The representatives of restaurant owners complained about mandated fees by music societies that were very difficult for the owner of a small business to dispute in a single Court of Appeal in New York City. They complained about double charging for fees that have already been paid by the network and advertisers. Restaurant owners referred to music played on radios or TVs as incidental use of music that did not have direct impact on customers’ decision going to restaurants. Restaurant owners believed the music fees were unfair and huge burden to small businesses.

I have spent my entire life in the hospitality business at the Balsams. I’ve dealt with almost every kind of contract and supplier and vendor imaginable. I can honestly say that I have never had a business relationship that comes close to resembling the one I have with the music licensing societies: ASCAP and BMI. It’s completely one-sided. They bill us, we are forced to pay without knowing how they set their rates, we have no practical way of contesting a fee that we think is unfair. In my business, I’ve come to find that it’s too expensive to whistle while I work.

*Stephen Barba, the Balsams Grand Resort Hotel*

Representatives of religious and specialty radios complained about the arbitrary high fees they have to pay to music societies to comply with copyright law even if they marginally use
copyrighted music on their radio channels.

My company owns WAVA here in Washington DC. Our format is mostly Christian teaching and talk, but certain programs may feature a copyrighted song so we've opted for ASCAP's and BMI's per program license. Do we pay just for the use of a particular song we play? No. ASCAP and BMI charge us a percentage of the revenues attributable to the entire program period whether we play 1 song or 20 songs. Are we charged the same rate as stations that play music all day long? No. If we try to use the per program license offered today and we play 1 hour of music they would charge us for 3 or 4 hours. Thus, if more than one-third of our programs contain copyrighted music we could end up paying more than the rock and roll station across the street that broadcasts music 24 hours a day.

*Stuart Epperson, Vice-Chairman, National Religious Broadcasters*

On the other side, representatives of songwriters and music industry rejected the notion of incidental music and argued their music improves the atmosphere of restaurants and help them keep their customers.

First, they said my music was just incidental to their business. Well, let me say that no songwriter that I know of wakes up in the morning, goes to the office or wherever he does his creating and says, "today I am going to write some incidental music that nobody wants to pay for." In every restaurant or tavern you'll find parsley on the plates, pictures on the wall, and some flowers and tablecloths on the table. All these things are incidental, but, incidentally, they're all paid for.

*Pat Alger, American Society of Composers, Authors and Publishers*

The opponents of H.R. 789 rationalized the role of organizations such as ASCAP, BMI and
SESAC as protecting the right of songwriters and musicians who cannot individually collect their rights from big restaurant chains and businesses.

There's no way that the new songwriter can individually know what businesses are using his music. There's no way that he can individually collect from these businesses even if he knows who was using it. There's also no way I can deal on a level playing field with powerful businesses like chain restaurants and broadcasters. That's why songwriters, together with their publishers, formed ASCAP in 1914. ASCAP and similar organizations, BMI and SESAC, find the users of our music and license them at a fair fee.

Pat Alger, American Society of Composers, Authors and Publishers

Hearing 5. Pre-1978 Distribution of Recordings Containing Musical Compositions; Copyright Term Extension; and Copyright Per Program Licenses hearing\textsuperscript{104} was convened on Jun. 27, 1997 in Nashville Tennessee by Subcommittee on Courts and Intellectual Property, Committee on the Judiciary in House of Representatives. This hearing was convened in three panels to consider the need to review and discuss the 1995 U.S. Circuit Court decision in \textit{La Cienega Music Co. v. ZZ Top}. The case examined whether the works of music on pre-1978 recordings which lacked copyright notices on their labels were considered public domain works, preventing songwriters and publishers from collecting royalties for use of the music. The hearing also reviewed the proposal to extend the term of current copyrights for an additional 20 years, and considered revising music licensing rules.

Two witnesses representing ASCAP and NMPA participated in the first panel calling for legislation to restore copyright protections for pre-1978 works. The second panel consisted of

\textsuperscript{104} U.S. Congress, House of Representative, Committee on the Judiciary, \textit{Pre-1978 Distribution of Recordings Containing Musical Compositions; Copyright Term Extension; and Copyright Per Program Licenses: Hearings before the Sub-Committee on Courts and Intellectual Property, 105\textsuperscript{th} Cong., HRG-1997-HJH-0058}, 1997.
representatives from Writers Guild of America – West, BMI, Songwriters Guild, Motion Picture Association, as well as a university professor in intellectual property providing opinion on extending copyright term and discussing the Copyright Term Extension Act of 1997. With the exception of Professor Jerome Reichman from Vanderbilt School of Law, other panelists supported the extension of copyright term. Professor Reichman expressed his concern about extending copyright term for works made for hire and suggested extending the term of copyright for true authors and artists.

Finally the last panel was dedicated to the practice of blanket music license requirements for religious radio stations and H.R. 789. The participants of the panel represented National Religious Broadcasters Music License Committee (NRBMLC) and Coalition for the Protection of America’s Gospel Music Heritage who discussed the blanket music license requirements for religious radio stations. They asked for per program license alternatives.

The proponents of the copyright term extension for pre-1978 works frequently referred to European Union copyright extension to support their arguments. They believed United States, as the leader in copyright, should be ahead of other countries in protecting the rights of the owners and should offer the same protection as European Union.

... The European Union has extended its term to life of the author plus 70 years. If the United States does not follow suit, we will lose 20 years of substantial foreign revenues from American intellectual property, the most sought after in the world. America's songwriters and other rights holders will have less protection in Europe than our European counterparts, and our trade balance will suffer accordingly.

David Weiss, President of Songwriters Guild of America

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The supporters of copyright extension for pre-1978 works referenced economic benefits for family members of the owner as another rationale. They framed the issue as a matter of fairness for the family of copyright holders.

... it seems only fair that the creators and owners of intellectual property enjoy the same benefits from their life's work as do other property owners. It is only fair that their children and grandchildren should be able to enjoy the fruits of their hard labor and sacrifice. Extending the current term of the copyright in the United States would put the American creators and owners on an equal footing with those in other fields.

Frances Perston, President and CEO, BMI

While most of the witnesses testified for extension of the copyright term, one panel of witnesses had a different opinion on who should receive the extension benefits. The Writers Guild of America spoke in support of extension but for the creators not the owners. They argued that even though some of the creators may have already transferred rights to other owners they should still receive the benefits of the additional 20 years extension instead of the current owners. According to this point of view, creators made all efforts to create unforgettable works and should be compensated by receiving the additional extension.

I am here to discuss the impact of the copyright term legislation on a group of American authors and creators who created motion pictures during the so-called "Golden Age." A group who created such classics as "The Best Years of Our Lives, Sunset Boulevard, Mr. Smith Goes to Washington, It Happened One Night and High Noon." A group that does not receive compensation for their work even though their movies are shown over and over. A group who will not benefit under the proposed legislation because the legislation gives the copyright owner, and not the actual creator, the additional 20 years of copyright protection. Copyright owners will reap a windfall from this extension even though many of them had no involvement with the actual production of the motion
Two main motives surfaced from the arguments of copyright term extension supporters: microeconomic and macroeconomic motives. Some of the panelists used fairness or other frames to rationalize economic benefits to right holders or creators via the extension of the copyright term. The Writers Guild of America argued for creators’ rights while other witnesses argued for the extension of the rights to owners. David Weiss, the President of the Songwriters Guild of America argued that the extension of copyright term is a “matter of equity, economic self-interest and cultural self-preservation.” Referring to the EU copyright extension law, Mr. Weiss asked Congress to preserve 20 years’ worth of foreign revenue to American copyright holders.106 Similarly, Fritz Attaway, Senior Vice President from Motion Picture Association of America argued that U.S. copyright owners would lose foreign revenue should the copyright extension law not pass.107

In the macroeconomic arguments, the witnesses referred to the positive impact of the extension on U.S. economy and the music and movie industries in particular. Don Sundquist, the Governor from the State of Tennessee in the opening statements of the hearing session mentioned the action of the European community in extending the term of copyright impacting American industries that rely on intellectual property. He urged Congress to extend the copyright term to pre-1978 works. In a letter to the Subcommittee on Courts and Intellectual Property that was recorded in the hearing document, the Songwriters Guild of America showed their support of copyright extension to pre-1978 works and argued that U.S. international trade

106 U.S. Congress, House of Representatives, Distribution of Recordings Containing Musical Compositions; Copyright Term Extension; and Copyright Per Program Licenses, 79.
107 Ibid, 104.
would be “seriously undermined” without the passage of the legislation.\textsuperscript{108}

Among the witnesses, the last panelist, Professor Jerome Reichman, Professor at Vanderbilt School of Law opposed the extension. He argued the U.S. copyright law substantially complied with the international minimum standards regarding to the duration of copyright. He urged Congress not to extend the term of copyright protection for works made for hire. For other copyright works, he encouraged Congress to give rights to the authors and artists instead of owners.

Echoing Professor Jaszi who testified at the Copyright Term Extension Act of 1995 hearing in the Senate, Professor Reichman cautioned Congress about harmonization between European and American copyright laws:

\begin{quote}
My study advises extreme caution when discussing harmonization or when making comparative judgments. Our laws and their laws are still very different, particularly with regard to works make for hire. Some works that are protected here in copyright law, such as sound recordings, are only protected in neighboring rights laws over there. They will receive only 50 years of protection in most EU countries. Other works that are protected here as works made for hire—the work-made-for-hire doctrine is often not recognized in Europe—may qualify, in principle, for longer protection over there. So we have to be very careful.

\textit{Professor Jerome Reichman, Vanderbilt University}
\end{quote}

\textbf{Hearing 6}. The Musical Licensing in Restaurants and Retail and Other Establishments hearing\textsuperscript{109} was convened on Jul. 17, 1997 by the Subcommittee on Courts and Intellectual Property, Committee on the Judiciary in House of Representatives focusing on the Fairness and Music Licensing Act (H.R. 789) to amend the Copyright Act of 1976 and revise music licensing

\begin{footnotes}
\item[108] Ibid, 99.
\item[109] U.S. Congress, House of Representatives, Committee on the Judiciary, \textit{Musical Licensing in Restaurants and Retail and Other Establishments: Hearings before the Sub-Committee on Courts and Intellectual Property. 105\textsuperscript{th} Cong.}, HRG-1997-HJH-0056, 1997.
\end{footnotes}
rules, in light of concerns about the impact on restaurants and other smaller businesses of music licensing practices of performing rights societies. During the hearing sessions, the witnesses reviewed and discussed provisions to exempt businesses from fee payments to performing rights societies for radio and TV performances if the performance of the music was considered incidental to the main purpose of the establishment and no direct charge was made to see or hear the transmission. The provisions under consideration also established certain requirements regarding the operations of the performing rights societies, including the ASCAP, BMI, and SESAC, Inc. to make the operation of these entities more transparent and comprehensible by business establishments and more fair to them.

The Fairness and Music Licensing Act required performing rights society to make available free online computer access to copyright and licensing information for each work in its repertoire. It directed those societies to provide per programming period license to radio broadcasters. The first panel consisted of the Registrar of Copyright Office and the representative of Dept. of Commerce who spoke in opposition to H.R. 789. The second panel consisted of representatives from the ASCAP, SESAC, and BMI who opposed to H.R. 789. The last panel introduced witnesses from Association for Exposition Management, National Restaurant Association, Fairness in Musical Licensing Coalition, and Thelma Showman School of Dance. The witnesses elaborated on current challenges with music licensing practices and their impacts on small businesses. The witnesses on this last panel uniformly supported the enactment of H.R. 789.

The motivation behind the argument was economic benefits and burdens. The supporters of H.R. 789 argued that the current music licensing practice gave overreaching market power to music societies that needed to be revised to give economic exemptions to small businesses. The representatives of dance studios joined other small business representatives to plea for more regulation and oversight on music licensing societies and to receive exemption on using music for educational purposes.
The music-licensing agents threaten and intimidate our teachers. They come into the classroom and frighten the children. They get away with this because small businesses like mine have no realistic way to dispute their authority.

Thelma Showman, Owner, Thelma Showman School of Dance, Broken Arrow, OK

And, finally, and significantly, the Department of Justice should be required to take a more active role in this. The music licensing system requires much greater scrutiny than it now receives. ASCAP and BMI and SESAC are government-sanctioned revenue collectors, like the IRS. However, there is little, if any, government scrutiny of their conduct. The societies are not required to disclose their revenues or other finances, the rationale for imposing particular fees, their salaries, their administrative costs. With power comes obligation, and when that power stems from an act of Congress, which this does, a much higher level of obligation is appropriate.

Gary Shapiro, President, Consumer Electronics Manufacturers Association and Representative, International Association for Exposition Management

The opponents of H.R. 789 claimed the bill would take away the rights from those who create music pieces who rightfully should be compensated for their intellectual works.

Why would anyone feel that 20th century technology should abolish the constitutional, intellectual, and artist rights of our citizens? Clearly, it is beyond dispute that the reason particular restaurants want to have radio music broadcast for their
customers is to attract financial gain without the author's permission or compensation. If that music is so valued to them, then they must give just compensation to those responsible for the creativity.

Representative Sonny Bono, from California

House Floor Debate

On March 25, 1998, the House debated and passed the Copyright Extension Act. In addition to extending the duration of copyright term for 20 years, the House debated an exemption of music uses for small businesses through two amendments introduced by Congressman Sensenbrenner and Congressman McCollum. Congressman Sensenbrenner’s version ultimately passed.

Figure 3-4: Word cloud visualizing the House debating Copyright Extension Act of 1998

At the floor debate, music was the main topic of discussion. Figure 4, the word cloud of the House debate over CTEA, visualizes the frequency of various words used during the debate. In

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110 Copyright Term Extension Act of 1998, H.R. 1456, 144th Congress.
the word cloud, words with highest frequency are presented with larger font size and are generally placed at the center of the visualization. In this example, the word “amendment” is at the center of the word cloud (See figure 3-4), which indicates the significant time the House dedicated to the issue of music use exemption for small businesses. In the word cloud, there is no reference to topics like research, knowledge and knowledge creation. The majority of the discussion was dedicated to securing economic benefits for people who work in the entertainment sector and, more specifically, the music industry or small businesses such as restaurant owners.

... This is an especially important protection for U.S. intellectual property since this parity will ensure that American works will receive copyright protection equal to that received in European countries for European-produced intellectual property. Because European countries are huge markets for U.S. intellectual property, this protection is worth hundreds of millions of dollars for works produced by Americans.

Representative Frost from Texas

There were also references to EU Copyright Extension and the Berne Convention and how CTEA can protect the economic benefits of works under copyright protection created by U.S. copyright owners globally. House members expressed strong sentiment towards securing the economic benefits of intellectual properties of American artists in Europe and the rest of the world where the term of copyright was extended to life plus 70 years.

... in 1995, the European Union extended copyright term by 20 years. If we fail to extend our copyright term as well, our intellectual property industry would lose millions of dollars in export revenues, and the U.S. balance of trade would suffer commensurately. European Union countries would not have to
extend to American works the additional 20-year protection that they have already extended to European works. This is an outcome we can and must prevent by passing HR2589.

*Representative Delahunt from Massachusetts*

Another major theme in the discussion was economic benefits for family members of right owners. Congressmen frequently referred to securing economic benefits to the heir of copyright holders as a right thing to do. More specifically, the supporters of the extension urged the House to pass H 1456 to secure benefits of the copyrighted materials for grandchildren of artists. As Congressman Frank from Massachusetts framed it:

> What we are saying is, we want to encourage creativity, not simply as a hobby, not simply as something that people who are independently wealthy can do on their own time, but as a way for people to earn a living to support themselves and their families.

*Representative Frank from Massachusetts*

During the March 25th debate, Congressmen Sensenbrenner and McCollum proposed two amendments to the extension act to provide exemption for using radio and television broadcast at small businesses. The House ultimately passed Mr. Sensenbrenner’s amendment which laid out the details of license fee exemptions for small businesses to broadcast music played by radio and television in their establishments. The opponents and proponents of the amendment mostly used economic fairness as their policy frame. The proponents of the amendment portrayed small businesses as hardworking individuals who were unfairly asked to pay music licensing fees to big music licensing organizations. On the other side, the opponents of the amendment argued that musicians and songwriters rely heavily on the music licensing revenue to make the ends
meet.

The Sensenbrenner amendment is nothing short of a "takings" provision. I have heard a lot about taking. This is about taking, whether to or not to. It would force songwriters to provide their music for free to restaurants and others. These restaurants then, in turn, use this music to enhance their business. How is this fair? For the thousands of songwriters, composers and music publishers, this amendment is a two-fold insult. First, it says to them, "Your hard work and creative talent aren't worth protecting." Then it says, "And by the way, it's not worth a dime either."

Representative Conyers from Michigan

The bill passed in the House in a voice vote and Congressman Sensenbrenner's amendment passed with 297 ayes, 112 noes and 22 not voting.

Senate Floor Debate

The Senate considered the Copyright Term Extension Act on October 7, 1998. Five Senators (Leahy, McCain, Thurmond, Kennedy and Lott) spoke in support of the bill. The debate was very short and passed unanimously in the Senate. Senator Patrick Leahy, Democrat from Vermont, quoted the statement made by the songwriter Carlos Santana: “As an American songwriter whose works are performed throughout the world, I find it unacceptable that I am accorded inferior copyright protection in the world marketplace” [emphasis added]. Senator Leahy continues: “The report indicates that from the years 1997 through 1996, the U.S. copyright industries’ share of the gross national product grew more than twice as fast as the remainder of the economy. ... These statistics underscore why it is so important that we finally pass this legislation today.” Senator Kennedy, Democrat from Massachusetts, urged Congress to pass the law to encourage America’s authors, artists, inventors and composers. He pointed to

111 Copyright Term Extension Act of 1998, S.11672, 144th Congress.
coordination of the copyright term with Europe as his main reason for supporting the bill. Senator Thurmond, Republican from South Carolina, quickly pointed to the benefits of the copyright extension to the American copyright community and building consistency with Europe. He also expressed his satisfaction on adding the provision that provided relief to small businesses.

The purpose of the extension act has been highlighted in the Senate Report. In the purpose statement, economic benefits, both at the micro and macro level, are the centerpiece of the copyright term extension.

The purpose of the bill is to ensure adequate copyright protection for American works in foreign nations and the continued economic benefits of a healthy surplus balance of trade in the exploitation of copyrighted works. The bill accomplishes these goals by extending the current U.S. copyright term for an additional 20 years. Such an extension will provide significant trade benefits by substantially harmonizing U.S. copyright law to that of the European Union while ensuring fair compensation for American creators who deserve to benefit fully from the exploitation of their works. Moreover, by stimulating the creation of new works and providing enhanced economic incentives to preserve existing works, such an extension will enhance the long-term volume, vitality, and accessibility of the public domain.

*Senate Report 104-315*

House Representative Sensenbrenner worked closely with the Senate to include the small business music use exemption provisions from the amendment to H.R. 1456 in the Senate bill. Few days after the Senate passed 105 S. 505 unanimously, the House unanimously passed it without any debate 105 H.R. 2589. The House passed the bill through a voice vote. The Sensenbrenner amendment passed 297 – 112 in the House.
The passage of Copyright Term Extension Act did not go without a backlash. In January, 11 1999, Eric Eldered, an Internet publisher, and other plaintiffs filed a lawsuit in District Court for the District of Columbia against U.S. government arguing that Congress violated the Constitutional requirements set forth in copyright clause by retroactively extending the copyright terms of the works already published and violated the limited term requirement of the copyright clause. They further argued that the extension of the copyright term enforced by CTEA did not pass scrutiny under First Amendment. The District Court rejected plaintiffs’ argument and the U.S. Court of Appeals for the District of Columbia Circuit upheld the District Court’s decision in a 2-1 opinion. On October 11, 2001, the plaintiffs filed a petition for certiorari to the Supreme Court, which was granted. Lawrence Lessig, the lead counsel for the petitioners presented the oral argument on October 9, 2002, and Solicitor General, Theodore Olson spoke on behalf of the government.

There are fewer constraints on the Supreme Court when the Court engages in judicial review of a law compared to standard statutory interpretation. Lessig’s legal strategy was to challenge the constitutionality of the law passed by Congress hoping to rely on broader power of the Court in the area of constitutionality. On behalf of the petitioners, Lessig argued that Congress’s power to extend the term of copyright law is limited by both Copyright Clause and under constraints imposed by the Free Speech and Press Clause of the First Amendment. He argued CTEA dramatically changed the scope of the Copyright Act and made the time limitations set forth by the Framers’ irrelevant.

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In response to the limitation set forth in Article One of the Constitution, the Court rejected petitioners’ argument and responded:

Petitioners’ argument essentially reads into the text of the Copyright Clause the command that a time prescription, once set, becomes forever ‘fixed’ or ‘inalterable’. The word ‘limited’, however, does not convey a meaning so constricted. At the time of the Framing, that word meant what it means today: ‘confine[d] within certain bounds’, ‘restrain[ed]’, or ‘circumscribe[d]. We count it significant that early Congresses extended the duration of numerous individual patents as well as copyrights.


In response to petitioners questioning Congress’s authority to extend protection to works already produced, the Court referred to past Congress’s practice of applying newly enacted copyright terms to future and existing works. In the opinion, the Court referred to Representative Huntington when Congress enacted the 1831 Act: “Justice, policy, and equity alike forb[id] that an author who had sold his [work] a week ago, be place[d] in a worse situation than the author who should sell his work the day after the passing of [the] act.” In other words, the Court found Congress’s decision in extending copyright terms for future and published works consistent with history and a matter of fairness. In judging whether the extension of copyright terms was a rational exercise, the Court deferred substantially to Congress: “[I]t is Congress that has been assigned the task of defining the scope of the limited monopoly that should be granted to authors... in order to give the public appropriate access.”114 The Court rejected the petitioners’ contention that Congress is making the copyright term perpetual through repeated extensions. Referencing to the Court of Appeals observation concluding, “nothing before this Court warrants congressional attempt to evade or override the ‘limited

Times’ constraint.”115 The Court added that previous extensions did not make copyright term perpetual neither did the enactment of CTEA.

Petitioners separately argued that the CTEA was a content-neutral regulation of speech that failed heightened judicial review under the First Amendment. The Court rejected that argument mentioning that “the Copyright Clause and First Amendment were adopted close in time. This proximity indicates that, in the Framers’ view, copyrights limited monopolies are compatible with free speech principles. Indeed, copyrights purpose are to promote the creation and publication of free expression.” Justice Ginsburg delivered the opinion of the court. As the author of the opinion she wrote, “In sum, we find that the CTEA is a rational enactment; we are not at liberty to second-guess congressional determinations and policy judgments of this order, however debatable or arguably unwise they may be... The wisdom of Congress’ action is not within our province to second guess.” Supreme Court affirmed the judgment of the Court of Appeals and rejected petitioners’ challenge to the constitutionality of CTEA. With this opinion, the Supreme Court found the extension of the copyright law a rational use of congressional power.

Summary of the Major Themes
Between 1994 and 1997 Congress invited 65 witnesses to testify and share opinions about copyright term extension and other related issues, such as licensing exemption for small business, motion picture preservation programs, and labeling requirements on motion pictures for substantive alterations. Both the House of Representatives and the Senate held floor debates in 1998 and passed the Copyright Term Extension Act by overwhelming majorities. Below I summarize the major themes I identified around the motivations and rationales shared by the witnesses and speakers.

Motivation to Request Copyright Term Extension

In October 1993, the European Union adopted a law that extended the term of copyright protection for works created in its member countries to life plus 70 years, a 20 year increase in protection. The directive required the members to implement the new law by July 1, 1995. The directive allowed EU member states to apply the rule of the shorter term which held that works granted copyrights by nonmember nations, such as United States, to be retained for the EU seventy-year term or for the term granted by the country of origin, whichever was shorter. According to the directive, the goal of the Berne Convention was to protect copyrighted materials for two generations after the death of the author. It was indicated that 50 years was no longer sufficient for this purpose. The proponents of the copyright extension overwhelmingly referenced the extension of copyright term in Europe as the main motive to demand extension in the US.

As you know, the European Union has adopted a directive to go into effect 1 month from today, which will make the copyright term throughout the E.U. 20 years longer than it is in the United States. But because of the rule of the shorter term, those European countries will not protect American works for additional 20 years unless our copyright term is also lengthened by 20 years.

Marilyn Bergman, President and Chairman of ASCAP

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The proponents of the copyright term extension framed the conversation as a situation where U.S. as the world leader in the production of copyrighted materials has to be ahead of Europe and other nations in protecting the copyrights of American citizens, inducing a sense of urgency.

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The emerging world standard for the term of copyright protection is life of the author plus 70 years. This is the term of protection that has been mandated by the European Community and implemented across Europe and elsewhere. As the world leader in producing copyrighted works, it would be unseemly—it would be just plain unthinkable—for the United States to lag behind other nations in protecting its copyright industries.

*Fritz Attaway, Senior VP, Motion Picture Association of America*

To magnify the sense of urgency in extending the copyright term, the proponents alerted Congress that the advancement in information technology has made it possible for the copyrighted materials to travel beyond borders with very little limitation made it possible for American copyrighted materials to be consumed in Europe and globally more than ever, and failure in passing the Copyright Term Extension Act would quickly result in the loss of revenue by U.S. copyright holders.

*Rationales in Support of Copyright Term Extension*

I discovered two major themes in supporting copyright term extension in the discourse studied in the scope of this project: macroeconomic impacts of the term extension and microeconomic impacts of the term extension.

Macroeconomic considerations

During the September 20, 1995 hearing session held by the Committee on the Judiciary at the House of Representatives, the Assistant Secretary of Commerce spoke in favor of the copyright term extension arguing the extension would bring money to the US economy.
What we concede is that, if we don’t do this, we will basically be leaving increasingly a lot of dollars on the table for the U.S. economy that we will not be able to collect. Now, our figures indicate that that will not be a lot right at the very beginning, but every year that goes by, that will start to increase to a fairly substantial amount. And I don’t think we are in the business of leaving money on the table that should go into the U.S. economy.

Assistant Secretary of Commerce and Commissioner of Patents and Trademark Office, U.S. Department of Commerce

The macroeconomic rationale, offered by the U.S. Department of Commerce, was echoed by other supporters of the copyright term extension at the hearing sessions and floor debates, including the President of ASCAP, the President of NMPA, and the President of MPA. Below is an excerpt of a statement made by Jack Valenti, the President of Motion Picture Association of America.

I think copyright term extension has a very simple, but compelling enticement and that is it is very much in the economic interests of the United States at a time when the words, "surplus balance of trade," is seldom heard in the corridors of Congress, when we are bleeding from trade deficits, and at a time when our ability to compete in the international marketplace is under assault.

Jack Valenti, President and CEO, Motion Picture Association

The macroeconomic rationale was an appealing argument to members of Congress as it connected the passage of the copyright extension to the improvement of the U.S. economy, job creation, and creating trade surplus for the nation especially when the speakers framed it in the context of losing the economic benefits to European nations and beyond.
Microeconomic considerations

The supporters framed the copyright extension as a fairness issue to American right holders who would lose the economic fruits of their intellectual properties to European countries due to the rule of shorter term.

You also noted that American authors should be given the same protection afforded their counterparts in Europe. I agree with this assessment. The importance of granting American authors the same protection as that granted to authors elsewhere has long been a position of the United States.

Marybeth Peters, The Register of Copyright

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The proponents of the extension argued the heirs of the right holders and more specifically the second generation of the heirs would likely lose the economic benefits of the protected work if the copyright term stayed at 50 years after the death of the copyright holder.

The impression given to me was that a composer's songs would remain in his or her family and that they would, one day, be the property of the children and their children after them. It never occurred to me that these songs would fall into the public domain while my children are still in the prime of their lives, and while my grandchildren are still teenagers or young adults. Yet this is exactly what will occur if H.R.989 is not enacted.

Bob Dylan, Songwriter, Musician

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The supporters of the copyright term did not directly mention microeconomic benefits of the extension for corporations that hold copyrights and constrained themselves to only referencing the macroeconomic benefits of those rights for the nation. In the discourse, there was no reference to securing the economic benefits of companies such as Disney, which would have
been significantly impacted if the Act had not passed.

Preserving culture
I observed a minor theme regarding preserving culture in this discourse analysis. Although not frequently noted, the issue of preserving culture was mentioned by few of the witnesses as another reason to keep copyrighted materials under protection for a longer period. They argued works under private control will be preserved with more care in comparison to the works that are passed to the public domain.

Just as important to remember is the sad reality that, once works fall into the public domain, the families of the creators have no incentive to maintain the works in a format that is useful to the public.

*Quincy Jones, Songwriter*

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Knowledge creation / stimulating creativity
There is no direct reference to promoting knowledge creation as the result of extending the copyright term in the discourse of congressional hearings and floor debates. On the contrary, the Register of the Copyright acknowledged that the extension would create negative impacts on libraries and scholars who try to access the protected materials and asked for some exemptions for learners.\textsuperscript{117}

The subject of creativity stimulation was brought up in the context of music creation. Marilyn Bergman, President of ASCAP, argued protecting the copyrighted materials for grandchildren of musicians is a powerful incentive for them to encourage creativity.

\textsuperscript{117} U.S. Congress, House of Representative, *Copyright Term, Film Labeling, and Film Preservation Legislation*, 162.
The second is that it is the right thing to do. The United States should do all it can to encourage creativity and to protect intellectual property. Extension of copyright term will serve to encourage the tens of thousands of music creators who struggle to earn a living in this highly competitive business, and for whom the prospect of leaving an asset of their own making to their children and grandchildren is a powerful incentive.

*Marilyn Bergman, Songwriter, President and Chairman of the Board, American Society of Composers, Authors and Publishers*

However, Ms. Berman offered no reference to research to support her argument that protecting the rights of artists’ grandchildren will stimulate creativity in the artists. Moreover, the opponents of the extension, such as Professor Denis Karjala, disputed the statement that the extension of the copyright term stimulates creativity arguing creators will not plan on the benefits of the second generation heirs in their decisions to create new works.\(^\text{118}\)

*Rationales in Opposition to Copyright Term Extension*

Among the 24 panels who spoke at the hearing sessions, two panels were assigned to the opposition to extending the copyright term. The witnesses in those panels were the members of academic institutions with expertise in the area of intellectual property law and cinema studies. Professor Karjala, Professor Belton, Professor Patry, and Professor Reichman testified at the last panel of the second hearing held by Subcommittee on Courts and Intellectual Property at House of Representatives. Professor Jaszi from American University testified at the hearing session held by the Committee on the Judiciary in the Senate.

Professor Karjala expressed his concern that the extension of the copyright term would impose substantial costs to the general public without supplying any public benefits. He further explained that the public would bear two costs should the copyright term would be extended: 1)  

the economic transfer payment to copyright owners from consumers during the period of extension, 2) the cost to the public of works that are not produced because of the diminished public domain. He added the extension of the term would impair the ability of living authors to build on the cultural legacy of the past and would hinder U.S. competitiveness in international markets. Professor Karjala further explained the extension would transfer wealth from the public to few corporations that own copyrighted works. Instead of following the wrong path that Europe took, he urged Congress to make efforts to persuade Europe that our approach to intellectual property rules both rewards creativity and promotes economic efficiency. Professor Karjala argued against different rationales of copyright term extension made by the supporters.

No incentives for the creation of works

Referencing a 150 year old quote from Macaulay, Professor Karjala explained that the long extension of the copyright term would not incentivize creators.

The evil effects the monopoly are proportioned to the length of its duration. But the good effects for the sake of which we bear with the evil effects are by no means proportioned to the length of its duration... It is by no means the fact that a posthumous monopoly of sixty years gives to an author thrice as much pleasure and thrice as strong as a motive as a posthumous monopoly of twenty years. On the contrary, the difference is so small as to be hardly perceptible.

Denis Karjala, Arizona State University

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In short, Professor Karjala argued that the additional 20 years of extension would not incentivize an author to publish more.

No support for two generations of descendants

Professor Karjala pointed to the fact that it is very likely that the copyright would be transferred before the current life + 50 year period has expired and unless those transfers provide for a
continuing royalty, there would be no royalties for the heirs. He argued that even if the extension would create revenue streams for the second generation of heirs that had never been a goal for the United States’ copyright law.

No harmonization with EU law

Finally, Professor Karjala rejected the argument that the extension would harmonize the US copyright law with those in Europe. He highlighted the European natural rights tradition that makes the European law fundamentally different from copyright law in the United States. He added Congress should not try to harmonize if harmonization means compromising important principles within the law. Nevertheless, the proposed legislation was not really aimed at harmonizing United States and European laws, he argued. For instance, the European law secures 70 years of protection for corporate authorship (5 years less than US then-current law) while the new copyright law would extend the copyright period for corporate authors to 95 years.

Professor Karjala’s co-panelists raised concerns about extending copyright term particularly for works made for hire. Professor Patry believed H.R. 989 would not satisfy either of the goals, i.e., 1) create parity between European and U.S. authors and 2) assure the author and the heirs fair economic benefits derived from the author’s work. Referring to jazz musicians in 1940s through 1960s, Professor Patry explained many of the contracts signed by those musicians were unfair and gave 90-99 percent of the right to the purchaser of the right. As the result, H.R. 989 would not help the authors.

I don’t think that these disparities are limited to foreign royalties. Indeed, there are many musicians who have been forced to sell their rights for a small, lump sum payment. Quincy Jones referred to some of them: Willie Dixon, Muddy Waters. These people had to sign retroactive work made for hire agreements. Two hundred
dollars was all they got. I have statements from record companies where people like Muddy Waters and Hawlin Wolf were in debt $50,000 for recoupable expenses for things like personal betterment or all sorts of other non-recording costs. These people never made it out of the hole.

William Patry, Benjamin Cardozo College of Law

Referencing TRIPS\textsuperscript{119}, Professor Reichman argued TRIPS established a minimum of 50 year term for producers of sound recordings and for most corporate productions. The U.S. already exceeded the minimum term for works made for hire, and by increasing the protection to 95 years, the magnitude of the existing divergence would increase even more.

I simply do not see how a 95-year term for U.S. corporate creations furthers the cause of harmonization, and I do agree with those critics who find that 95 years is excessive on the merits. A 95-year incentive is not needed to stimulate investment in the cultural industries, and its social costs for research and educational users alone would greatly exceed any benefits to society.

Jerome Reichman, Vanderbilt University

Echoing Professor Reichman, Professor Belton asked Congress to consider differentiating between works made for hire and works owned by authors. He reminded Congress that works made for hire are owned by corporations and the life expectancy of the corporations are not determined by human longevity. Therefore, we would not need to increase the copyright term

\textsuperscript{119} TRIPS was an agreement on Trade Related aspects of Intellectual Property Rights signed by the member nations of the World Trade Organization in 1994. The agreement set minimum standards for the intellectual property regulation by national governments.
for works made for hire using the logic that’s being used for “works produced by flesh and blood authors.”

Professor Belton mentioned the cinematic works in England and France were protected for 50 years. Under the contemporary copyright law in the U.S. works for hire were protected for 75 years, which was in excess of the European Community. “I see no point in extending protection for works for hire to 95 years, given that there is no European precedent for the 95 year figure.”

Professor Belton explained the role of public domain in the creation of new works and the difficulty that the extension of the term can cause for educators.

Works that fall into the public domain become a very valuable resource for new creations, and this is an argument that’s been made again, but I will give you one or two examples. I think one of the most forceful copyright holders is the Disney Corporation. Yet, a great majority of their animated films are based on stories that come from the public domain. You can go back to "Snow White and the Seven Dwarves," "Pinocchio." More recently, we have "Little Mermaid," "Beauty and the Beast," "Aladdin," and "Pocahontas." And without this kind of well of source material, a kind of cultural matrix of property that Disney very much needs, depends upon, these great animated films of the last few years would not have been made... As educators, our problem is reasonable access, and I have a whole document, anecdotal evidence of just how difficult it is to get reasonable access to copyrighted and uncopyrighted materials, which is in the record, but it is not trivial, the problems that are faced by educators in trying to pass on the culture of the moving image to our students.

John Belton, Rutgers University

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At the hearing held by the Senate, Professor Jaszi expressed his opposition against the extension of the copyright term. He rejected the idea that works that goes into public domain are not necessarily more accessible. Professor Jaszi explained, beyond reprinting, public domain

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120 U.S. Congress, House of Representative, Committee on the Judiciary, Copyright Term, Film Labeling, and Film Preservation Legislation: Hearing before the Subcommittee on Courts and Intellectual Property, 104th Congress, HRG-1995-HJH-0049, 1995, 281
121 Ibid. 282
encourages a wide range of new uses such as translation, adaptation to new media, and scholarly commentary that have been ignored by the supporters of the term extension. Moreover, publishers compete to offer new editions of popular public domain works, for instance works such as Sherlock Holmes are constantly republished. Like Professor Karjala, Professor Jaszi pointed to the different nature of U.S. and European copyright laws. The U.S. law is designed as a mean to achieve social benefits while the Europe considers copyright as a natural right. Professor Jaszi added the primary claim of the supporters of the extension i.e. raising financial benefits for the copyright owners has no place in the analytic framework of copyright law to achieve general social benefits in the United States.

No matter how superficially appealing the suggestion that copyright owners, individual and corporate, are somehow entitled to additional protection as a matter of "justice," and no matter how appropriate such a suggestion might be in the context of other national legal traditions, it can have no bearing on copyright policy-making in our own.

_Peter Jaszi, American University_

_HRG-1995-SJS-0045, 1995, Page 74_

Professor Jaszi called out the argument that the extension of copyright term can encourage dissemination of the works, therefore, create more public benefit as a fallacy. He added if a work that has already been passed to public domain is popular, it will still be disseminated because it will generate profits for the publisher. In the same token, works that are not profitable will not get the attention of the publisher even if the work is under copyright protection. He casted doubt on the argument made by the supporters of the copyright extension that the extension motivates creators. “It is difficult to imagine that the potential of income to a remote unknown descendant or other successor in the distant future could do much to motivate a writer, painter, or computer programmer in the present especially when that potential is discounted to reflect the unlikeness of any work created today retaining significant market appeal 75 years or a century
from now.” In conclusion, he pointed to explicit and hidden costs that the extension of the copyright term would impose to American culture and urged Congress not to pass the Copyright Extension Act.

Next Step
The qualitative analysis of the hearing sessions and floor debates indicated that the central motivation and rationale behind the ask to extend the copyright term was economic and not knowledge creation. In the next couple of chapters, I will present mathematical models to study the impact of copyright extension on knowledge creation, the goal set by the founding fathers to pass copyright laws.
Chapter 4: Does longer copyright protection help or hurt scientific knowledge creation? A Quantitative Analysis of Copyright Term Extension

Introduction

The number of scientific publications has been growing. Larsen and Ins estimated 4.7% growth overall in scientific publications between 1997 and 2006. Policymakers are interested in observing a higher growth of knowledge in the society as it contributes to the advancement and development of the country. As an important policy tool, the Constitution empowered Congress to pass copyright laws to promote the progress of knowledge and discoveries. The copyright clause empowers the United States Congress “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” According to Walterscheid, the progress of science and useful arts in the context of the 18th century translates into “the advancement of useful knowledge and discoveries.” Lawmakers have extended the copyright term many times since its inception in 1790. There are many interesting economic studies on copyright law. However, little research has been conducted on how the extension of the copyright term contributes to the production of knowledge, the very goal for which this policy tool was designed. We learned from chapter 3 that the main motivations behind passing Copyright Term Extension Act of 1998 were economic improvements.

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122 This chapter is drawn from Shahram Haydari, and Rory Smead. "Does Longer Copyright Protection Help or Hurt Scientific Knowledge Creation?" Journal of Artificial Societies and Social Simulation 18, no. 2 (2015): 23. It has been edited and modified for the purpose of this work.
123 Peder Olesen Larsen and Markus Von Ins, "The Rate of Growth in Scientific Publication and the Decline in Coverage Provided by Science Citation Index," Scientometrics 84, no. 3 (2010).
125 Using an economic model, Landes and Posner (2009, 71-85) argue that copyright law should balance financial incentive for creators and the cost of expression. In another economic analysis of copyright law, it is shown that the supply of work and economic incentive are positively correlated for big screen movies. However, Copyright Term Extension Act seems to have insignificant impact on new creative works (Hui & Png 2002). This finding confirms another empirical research in which Tor and Dostan (2002) show the extension of the copyright from lifetime plus fifty years to lifetime plus seventy years provides little additional incentive to create. Landes and Posner (2009, 234-253) compare the current length of copyright law to a short fixed term with the possibility of indefinite renewal right and conclude that the expected economic life of most copyrighted works is short. They argue that the size of the public domain expands under the latter system, and a system of indefinite renewals will separate valuable works from works in which the cost of continuing that protection exceeds the sum of administrative and access costs.
ones. There was no significant reference to knowledge creation and learning as a rationale to extend the copyright term. In this chapter, I take a step to study how the length of copyright term impacts knowledge creation by implementing and analyzing an agent-based model of discovery and publication. The model suggests that the extension of copyright term generally hurts knowledge creation. More importantly, the extension does not only hurt those with lower access to copyrighted materials, but also hinders scholars with access to all copyrighted papers. However, there are also scenarios where extending the copyright term moderately helps knowledge creation.

Accounting for the motivation of scholars and scientists is central to understanding how to promote knowledge creation. Aristotle believed that the desire for knowledge was part of human nature. While there is not a strong consensus on a specific account of motivating factors for knowledge creation, there is a general sentiment that pursuit of truth is probably an important component. Social epistemologists also argue that credit, respect and honor can also motivate scholars and scientists to create new knowledge and publish papers.\(^\text{126,127}\) Such factors also encourage openness in science.\(^\text{128}\) Bonilla takes this idea even further and argues that scientists’ main motivation is not the pursuit of truth but the pursuit of recognition.\(^\text{129}\) Accepting the role of credit seeking in the expansion of knowledge, Hull discusses the types of credits considered the most important and the effects that striving for credit creates on science.\(^\text{130}\) Scholars may prefer minimal copyright protection because it increases the level of access to their scholarly works and


\(^{130}\) "Credit comes in a variety of forms from prestigious prizes to citations. Of these, one sort of credit is most fundamental-the use that one scientist makes of the work of another. The success that is central to science is not career advancement but mutual use. Science has the cumulative character it has in part because of this sort of credit. Because scientists must use the work of other scientists, they are forced to cooperate in a metaphorical sense with even their closest competitors, i.e., use their work." (Hull, 1988, p514)
results in academic promotions and improves their academic prestige.\textsuperscript{131} For these reasons, I will focus on the impact of copyright law on the production of publications and citations rather than on, say, economic factors.

Even with a restricted focus, attempting to study the effect of copyright law on knowledge creation is fraught with complexities. The environments that scholars find themselves in are far from simple; they may involve different legal systems over different periods of time while experiencing rapid technological advancement. Thus, real systems may be too complex and difficult to analyze if I am interested in assessing the specific effect of copyright law on knowledge creation. Agent based modeling provides a method of abstracting away from many real-world complexities and isolating the particular interdependent dynamics I am interested in studying.

The Model

The aim of the model is to assess the impact of the term length of copyright law on knowledge creation. This requires a representation of a given field or area of study, scholars doing research in the field, and a way to represent copyright and access to copyrighted material. The model consists of a set of agents (scholars) that explore a network of connected research topics (an “epistemic plane”), attempting to publish new research based on what is already known. Published research may be copyrighted, limiting access to that research for some researchers. I will examine the effects of varying copyright terms on the efficiency by which scholars publish new research as well as how copyright terms might impact citation tendencies.\textsuperscript{132}

Epistemic Planes

I will use a simple spatial network to represent a field of research. The nodes on this network represent specific research topics and the distance between nodes corresponds to the similarity


\textsuperscript{132} The model and simulations were implemented using NetLogo.
of topics. A real research field is highly complex and would resist a simple uniform representation. I will abstract away from such complexities and treat all topics in a field as equally valuable with a constant distance between neighboring topics. I refer to this representation as an “Epistemic Plane.” In the models presented here, the epistemic plane will be a lattice (see figure 1).

Figure 4-1: Knowledge points in Epistemic Plane

This has the advantage of being a regular, connected network that captures similarity of topics in a systematic way and is conducive to visual representation. The number of steps between nodes corresponds to the similarity of topics: the farther you get from one point in epistemic plane, the larger the difference in research questions and concepts. Some points in the landscape are designated as “discovered” (published research) others as “undiscovered” (undiscovered knowledge). Published research varies in access level: copyrighted and open-access/public domain. Copyrighted works are available only to high-access scholars. Open-access/public domain works are available to everyone.

The discovery of new points and production of new publication is driven by a set of scholars.

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133 Refer to chapter 2 for more information on epistemic plane.
134 In one of the earlier studies in simulating knowledge discovery, Gilbert (1997) designed a fairly simple model to simulate the creation of scientific papers. He introduced the concept of “kene,” synonymous to the concept “genes”, which carries the information of the paper, and each paper represents a new quantum of knowledge. In his model, the kene of a newly produced paper is a function of the cited papers. Coordinates in an epistemic plane are similar to quantum of knowledge in Gilbert’s model. Similarities of the kenes create knowledge topics that are closer to each other. The same concept applies to epistemic plane.
Scholars are agents that occupy specific points and move through the network as their research progresses, seeking to read published work and publish undiscovered topics. Because scholars tend to progress to related topics, their movement in the model will often be constrained to neighboring nodes. The neighborhood size represents the range of nearby concepts or topics that a scholar would perceive. Scholars will begin at known points, read (if they have access), and move to new neighboring points. When they are near an undiscovered point and have read a sufficient number of nearby known studies, they will move to the undiscovered point and publish new research. That point is then designated as “discovered.” It should be noted that although real scholars participate in a variety of research activities such as lab experiments or independent theoretical research, this model abstracts away from these details focusing only on reading and publishing.

Research Cycles and Copyright Term

Discovery on the epistemic plane occurs in discrete time steps. Each time step, every scholar will either publish new research or read existing work. Publishing is given the highest priority. If a scholar is within the neighborhood of an undiscovered point, and they have read a sufficient number of published studies in that area, they will move to that point and publish a new study. When publishing, the author “cites” all read articles within the neighborhood of the newly published work. In the case where a scholar has multiple options to publish, one is chosen at random. If publishing is not an option, they will choose an accessible article within their current neighborhood that they have not yet read, move to that location and read the article.\(^{135}\) When selecting an article to read, scholars give preference to the most recently published articles, choosing randomly among any ties. The idea behind this strategy is to facilitate reaching the

\(^{135}\) The concept of reading articles in this model is similar to acquiring food in models of foraging behavior. Sellers et al. (2007) developed an agent-based model to study the key activities of chacma baboons in South Africa. Baboons, agents in this model, move to other parts of the map to find food or water to fulfill their needs. Roberts and Goldstone (2006) developed an agent-based model to study the group foraging behavior in human. In this model, each agent makes probabilistic movement decisions to find food.
frontier of knowledge discovery as soon as possible. If there are no options to publish or read within a scholar's current neighborhood, the scholar will relocate to a random un-read and accessible discovered point and read the corresponding article. Each agent executes one publish/read step before the process repeats.

All discovered points are designated as “copyrighted” or “open-access.” Scholars are of two types: those that can only read open-access articles (AL0 scholars) and those that can read any article (AL1 scholars). Simulations begin with a pre-discovered, connected area of articles that are each randomly assigned an access level. Scholars begin in the middle of this area and proceed to explore the epistemic plane as described above. All copyrighted articles remain restricted-access until they have been in existence for a predetermined number of time steps—this is the copyright term. After the copyright term for an article expires, the article becomes public domain. Newly published articles are randomly assigned an access level and if copyrighted will remain so for the length of the copyright term beginning from the time of publication. It is important to note that the copyright term is expressed in number of cycles in the model, not measured in years. Cycles represent the publication or research rate of the scholars and the way in which this translates to years will vary from discipline to discipline.

Figure 4-2 provides a visual illustration of the model. Discovered points are green and undiscovered points are gray. The two shades of green for published articles represent the current access levels for those articles: open-access in light green and copyrighted in dark green. Figure 4-3 provides a closer look with agents occupying the epistemic plane. AL0 scholars are represented in blue, AL1 scholars in red.

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136 It is estimated that about 50% of papers are currently available in one of the open access forms in several countries including the United States. See Eric Archambault, Didier Amyot, Philippe Deschamps, Aurore Nicol, Lise Rebout, and Guillaume Roberge. "Proportion of open access peer-reviewed papers at the European and world levels—2004-2011." *Rapport, Commission Européenne DG Recherche & Innovation* (2013).
The figure demonstrates scholars exploring epistemic plane

Results

I measured the overall rate of publications and citations under various copyright term lengths to understand if changes in copyright term length may have any significant impacts on number of publications and citations. I also look at both access-level-one and access-level-zero scholars separately in the model under various copyright term lengths to analyze how well each group of scholars perform in publishing new knowledge and receiving citations to their published articles. I approximately ran 180,000 independent experiments with copyright term ranging between 0 and 200 cycles, with varying neighborhood sizes and citation requirements. The number of scholars in these experiments also varied ranging from 10 to 500 and scholars were randomly assigned an access level of one or zero. Two important themes emerged from running the model: 1) There was a general tendency for longer copyright terms to hinder knowledge creation, 2) This tendency, however, was not universal and there are scenarios where the extension of the copyright term can (moderately) help knowledge creation.

Here are copyright terms that were explored in this agent based molding: [0, 1, 2, 5, 10, 20, 50, 100, 150, 200]. I ran the experiments with a series of neighborhood sizes and required citations: [(1,1), (1,2), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2), (3,3), (3,4), (3,5), (3,6), (3,7), (3,8), (3,9), (3,10), (3,11)].
Does copyright hurt knowledge creation?

The prevailing trend in most simulations was that increasing the copyright term resulted in decreased knowledge production. The drop-in knowledge creation was steep in initial copyright cycles and flattened when the copyright term increased. The declining trend is intuitive, because under shorter copyright protection regimes, access to published articles goes up and scholars can more easily read and cite discovered knowledge. Consequently, scholars can publish new papers more rapidly. The impact of increase in copyright cycles is more dramatic when the required citations are higher. For example, when eleven citations are needed, the number of published papers declines about seventy percent when I extend copyright protection from zero to two hundred cycles, while the drop-in publications is only about twenty percent where required citations are five (see figure 4-4). Although the general trend is intuitive there are several more specific features of the results that are particularly interesting.

![Figure 4-4: Total publications under different copyright cycles](image)

The set of graphs compares three required citations of five, nine and eleven respectively from left to right. In all three graphs the number of scholars is 200 and the size of the neighborhood is 3. I ran the model for 250 cycles.

First, most of the decline in knowledge production happens in initial cycles of copyright. For example, in the scenario where I require eleven citations, 63 of the 70 percent total decline in knowledge production happens in the first 25 cycles. The curve begins to flatten after 25-cycle point. However, when the required citation is lower, I see a more gradual decrease in knowledge creation. The increase from 150 to 200 cycles has very little negative impact regardless of
citation requirements. The same trends also occur with respect to the impact of copyright term on citation rates, where the results are qualitatively similar to those regarding publications.

Second, copyright has a very large negative impact on scholars with restricted access, leading to large inequalities between the groups. The decline in the publication of AL0 scholars is intuitive because increasing the copyright term means these scholars will have access to fewer articles to read and, as a result, fewer opportunity to publish. It is, however, interesting to note that most of this inequality typically emerges in the initial increase of copyright term from 0 to 25. And, increasing the copyright term beyond this point tends to, very moderately, reduce both inequality and overall productivity (see Figure 4-5). The same trends hold for citations.

**Figure 4-5: Average publications made by AL0 and AL1 scholars**

These graphs assess knowledge production under different copyright cycles. In all graphs, the neighborhood size is set at three and I included two hundred scholars to the epistemic plane.

Additionally, by increasing the number of required citations, the impact of copyright extension becomes more significant on knowledge production especially on AL0 scholars. The same trends hold for citation graphs. In all these scenarios, by increasing copyright cycles, the knowledge production is shifted more to AL1 scholars (see graph 4-6). In scenarios where more citations are required, the majority of knowledge is produced by AL1. For example, with required citations set at eleven and copyright term sets at 50, 93% of knowledge is created by AL1.
scholars while ALo scholars have a low contribution rate of 7%.

Figure 4-6: The contribution of ALo and AL1 scholars in knowledge production under different copyright cycles

For ALo scholars in the model, I calculated the number of times scholars forced to look for accessible articles outside the current neighborhood where they located due to the lack of accessible articles. In other words, ALo scholars had to change their research subjects to be able to read and find new ideas to publish. In reality, scholars may show more perseverance to explore the subject they are currently investigating and may decide not to switch subject if they could not find articles to read too quickly. However, measuring number of times ALo scholars switch research subject gives us some indications on how copyright extension may cause challenges for scholars with limited access to copyrighted materials. Naturally, by tightening copyright protection, ALo scholars had to shift neighborhood more frequently (see graph 4-7).

Figure 4-7: Number of shifts under different copyright cycles
The set of graphs illustrates the impact of copyright extension on number of times ALO scholars had to switch research subject.

Finally, aside from the inequalities created by copyright, it is interesting to note that all parties are negatively impacted by an increase in copyright term. The lack of enough activity among ALO scholars reduces knowledge discovery in the epistemic plane. Therefore, fewer published articles are available to AL1 scholars to read and cite which culminates in lower rate of publication among AL1 scholars. In the scenarios examined in graphs 2 and 3, although AL1 scholars do much better than ALO scholars under the presence of copyright, everyone is worse off than they would be without any copyright.

How does the extension of the copyright term impact knowledge production when I change the number of scholars in epistemic plane? Naturally, by increasing the number of scholars in epistemic plane, knowledge production goes up. However, when I extend copyright protection for published articles, it slows down the production at a higher rate when I have more scholars in the field. In other words, in scenarios where I have enough scholars in the field to compete in publishing new articles, the copyright protection slows down knowledge production more significantly than the scenarios where the field is less crowded. When I have fewer scholars on the epistemic plane, they have more opportunities to publish. Figure 4-8 illustrates how extension in copyright protection impacts knowledge in research fields with different number of scholars. The same trend holds in number of citations where the results are qualitatively similar to those for publications.
The impact of longer copyright protection is more significant when more scholars are producing knowledge in the epistemic plane.

*Can Copyright Help Knowledge Creation?*

The prevalent pattern is that increasing copyright cycles in the model reduces the total number of published articles and total number of cited articles in many scenarios as explained in the previous section. However, there are certain circumstances where an increase in copyright term can help knowledge creation. This occurs when the required citations are very low and there are relatively few scholars. With respect to the citation factor, varying the required citations shows that copyright promotes knowledge creation with fewer required citations and hinders knowledge creation with more required citations (see graph 4-9). By increasing the required citations, the shape of the graph gradually shifts from increasing and staying flat to peaking and declining and finally to declining only.
These graphs illustrate knowledge production with various required citations (RC's) in a two-radius neighborhood with 10 scholars in the epistemic plane. Under required citation of one, the number of publications goes up when the copyright cycles changes from zero to ten, then it flattens and stays fairly unchanged. It is important to point out that the increase in publications is a modest 3% in this graph.

In addition to required citations, the number of scholars in the model is another factor that impacts knowledge creation under different copyright cycles. The set of graphs in graph 4-10 illustrates knowledge creation with various numbers of scholars in the epistemic plane. In fields where there are more scholars, stronger copyright protection hurts knowledge creation, whereas in cases where there are fewer scholars and the required citations is kept low, extending copyright cycles modestly improves knowledge creation initially with little change afterward.
In these scenarios, scholars are required to cite a minimum of two articles in a three-radius neighborhood to publish new papers.

The explanation for this modest increase in certain settings relates to the division of labor in science. This topic has been explored by many scholars in a number of different settings. With respect to our model, the division of labor occurs as scholars spread out across the epistemic plane, each exploring separate local areas. When there are very few scholars in the field, a shorter copyright protection term creates division of labor and enables more scholars to reach the frontier of knowledge discovery more quickly, and avoids concentrating in the same area. As the result, there is a modest improvement in knowledge creation. The low citation requirement minimizes the impact of copyright on ALO scholars as they have some open access articles available to read in the neighborhood. As the result of shorter copyright protection terms in the epistemic plane, ALO scholars preform equally well in knowledge production as AL1 scholars.

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When the required citations increases, however, the slight improvement resulting from division of labor is cancelled by the adverse impact of copyright protection on accessibility of the newly published papers.

Similar to the general trend, by increasing the number of scholars in epistemic plane, knowledge production goes up. However, in scenarios where the required citation is kept very low, the extension of copyright does not have a larger effect on the knowledge creation when there are more scholars in the field (see figure 4-11). This is because very low citation requirement leaves enough open access articles in the epistemic plane for access level zero scholars to cite and contribute to the discovery process.

Figure 4-11: Total publications made by various number of scholars under low citation requirement

The graph illustrates a scenario for knowledge creation under different copyright cycles with one required citation in two-radius neighborhood.

Discussion

The founding fathers of the United States intentionally defined the purpose of copyright law very narrowly as a policy tool to promote knowledge creation and learning. In this chapter, I
studied the impact of copyright term length on knowledge creation using agent based modeling. Needless to say, copyright law has a broad scope and applies to many subject matters from literary works to sound recording and architectural works. The scope of this research is limited to literary works and more specifically scientific publications. So the findings of this research should not be generalized to all types of copyrighted subject matters.

Generally speaking, the extension of copyright term hurts knowledge creation in most scenarios. The adverse effect of the extension is more prominent when scholars have to read and cite more articles before publishing new knowledge, when the neighborhood size is left unchanged. The extension of the copyright term hurts more dramatically initially and it becomes less damaging afterward. When I change the policy from open access to a very limited copyright term, it has much more significant impact than a policy change to extend the copyright term from hundred cycles to two hundred cycles. Importantly, the extension of the copyright term does not hurt only those who have lower access levels. It hurts all scholars in the epistemic plane and the impact is more significant when there are more researchers in the field.

The increase in copyright term does not always hurt knowledge creation, however. In some scenarios, the extension of copyright term moderately improves the rate of publications and citations. In scenarios where a low number of citations are required to publish in the field, a limited copyright protection policy helps scholars to receive more credits and generate more knowledge. I believe copyright protection creates a division of labor in the epistemic plane allowing scholars to reach the frontier line of knowledge creation more quickly. One possible scenario of this scenario could be emerging research fields with few scholars in which researchers do not need to borrow from literature significantly, where the creation of new knowledge is mostly the result of lab research and is not attributed to the previous works.

Insofar as the sole goal of copyright is knowledge production, ideally copyright protection would
apply only in those fields that the copyright protection helps creation of new knowledge.\textsuperscript{139} If such a nuanced policy option is not feasible, I recommend cutting copyright protection across academic disciplines to increase access to published works. Generally speaking, the access to past research enables scholars to receive more credit, in terms of citations and research impact, for their published works. Receiving more credit will arguably motivate scholars to explore the research field more effectively and publish more new knowledge.

Historically, copyright law has helped publishers to remain profitable and stay in business. Therefore, it has provided an infrastructure for authors to publish new knowledge. However, it seems plausible that with the advancements in information technology and social media, there are opportunities for authors to become less dependent on publication companies, but this discussion is beyond the scope of this research. Assuming publication companies with their current format still play a vital role in generating new knowledge by providing the publishing infrastructure, a complete removal of copyright protection from scholarly publications without introducing any other policy tools would likely result in the bankruptcy of publication companies. Consequently, some copyright protection may be important for keeping these companies afloat. The results of our model, however, suggest that such protection also hinders knowledge creation in these areas. Therefore, if the ultimate goal of copyright law is knowledge creation, it seems that the length of copyright term should not be longer than is necessary to keep publication companies marginally profitable.

In this chapter, I took the first step towards modeling the impact of copyright term on knowledge creation. Our model simulates few but essentials concepts of knowledge creation in scientific fields to keep the model simple and robust. However, the model also has some important limitations and idealizations that warrant a brief discussion. For instance, I did not\textsuperscript{139} In research fields where copyright protection promotes knowledge creation, other policy options may have advantages and easier to implement in comparison to copyright policy to create division of labor effect. Alternative policy solutions must be evaluated to find the best option.
include any stakeholders beyond scholars in the model. In addition, the model represented scholars as relatively simple decision-makers that aim to produce publications in a relatively short-sighted manner. Expanding the model to include entities like publishing companies and universities and track financial incentives for publishing companies is a natural step for future research. Additionally, the epistemic plane has been portrayed as a simple uniform network, which may not be the case. It is possible that the epistemic structure of research fields may impact the role that copyright protection plays in helping or hindering knowledge creation. Thus, other, irregular or more complex networks of research topics should also be examined.
Chapter 5: The Impact of Copyright Term on Knowledge Creation; the Analysis of Self-Citations

Introduction

In chapter 4, I studied the impact of copyright term extension on scholars’ motives to generate new knowledge, i.e. credits attributed to scholars by implementing and analyzing an agent-based model of discovery and publication. The findings suggest that the extension of copyright term generally hurts the knowledge creation process and the credits earned by scholars. More importantly, the extension does not only hurt those with lower access to copyrighted materials, but also hinders scholars with access to all copyrighted papers. I also identified scenarios where extending the copyright term moderately helped knowledge creation. In both cases, scholars that publish copyrighted materials tend to out-perform those that do not, creating a potential tension between individual incentives and the public good.

Self-citations were allowed in the model developed in the previous chapter and scholars could use self-citations to fulfill minimum citation requirements in order to publish new paper. Moreover, self-citations were counted towards credits earned by scholars. However, there is an ongoing debate about the role of self-citations in measuring academic quality, which demands further analysis of the impact that copyright term extension may have on knowledge creation and credit earning process in the absence and presence of self-citations. In other words, it is important to know how self-citations impact credits earned by scholars when the copyright term is changed. To achieve this goal, I modified the original model in two parts. First, I allowed self-citations but did not count them towards credits earned by scholars. Second, I disallowed self-citations in publishing new papers. The findings suggest that the extension of the copyright term generally hurts credits earned by scholars in both modified version of the model similar to the

\[140\text{This chapter is drawn from Shahram Haydari, “The Impact of Copyright Term of Knowledge Creation: The Analysis of Self-Citations” in Policy Perspective from Promising New Scholars in Complexity, edited by L. Johnson; J. Cochran, (Washington, DC: Westphalia Press, 2016) It has been edited and modified for the purpose of this work.}\]
original model where self-citations were permitted. Allowing self-citations but not counting them towards credits earned by scholars’ help decrease inequality among scholars with higher and lower access to published knowledge to earn credits. Finally, ignoring self-citations in credit counts encourage high access scholars to publish open access and help preventing or at minimum slowing down the academic tragedy of commons. When self-citations were disallowed, there was no significant difference between high access scholars who published open access and those who published under copyright.

Before explaining the model, a few introductory remarks about self-citation will be helpful. Citation analysis is widely used as a measure for academic quality of scholars’ research. The underlying assumption is that authors select their references on the basis of quality. The use of citations as a measure of research quality is not without its problems. One of the debatable areas of using citations is self-citation. A self-citation is usually defined as a citation in which the citing and the cited paper have at least one author in common. Self-citation accounts for a large number of citations in the academic publications. The use of self-citations varies by research fields. Mathematics, natural and engineering sciences are characterized by large shares of author self-citations. The estimated rate of self-citations in this field worldwide is 40%. On the other hand, the self-citation rate is low in some other fields such as biomedical research (about 18%). The more authors cite themselves, the higher the chance to get cited by other researchers. Fowler and Aksnes show that one self-citation increases the citations from others by three after five years of publication and there is no significant incentive penalty for frequent self-citers. In many cases, self-citations are excessive and problematic in evaluating scientific

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142 Dag Aksnes, "A Macro Study of Self-Citation," *Scientometrics* 56, no. 2 (2003).
In the study of 45,000 publications in Norway, using a three-year window Aksnes shows that 36% of all citations represent authors’ self-citations. The rate of self-citations is shown to be the highest in the first year of publication. While the impact of self-citations on macro level is thought to be minimal, at meso and micro levels, the impact cannot be ignored. Glanzel and Thijs recommend using both indicators including and excluding self-citations at the meso level to better analyze institutions and research fields. Given the controversy around self-citations and the fact that self-citations are means for low access scholars to access copyrighted works, it is important to look at the impact of copyright term extension on the credits earned by scholars by including and excluding self-citations to see how self-citations impact the outcomes of this research. I will use agent based modeling to answer this research question.

The Model

The aim of the model is to assess the impact of the term length of copyright law on knowledge creation, specifically in the sciences in the absence and presence of self-citations. The model I used for this research is the modified version of the model used in chapter 4. The model consists of a fixed set of agents (scholars) that explore a network of connected research topics (an “epistemic plane”) attempting to publish new research based on what is already known. Published research may be copyrighted, limiting access to that research for some researchers.

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146 Aksnes. See footnote 138
149 Dag Aksnes, "A Macro Study of Self-Citation," ibid.56, no. 2 (2003).
151 The model and simulations were implemented using NetLogo.
Epistemic Planes

Like the previous chapter, I will use a simple spatial network, a lattice, to represent a field of research (see Figure 5-1).

Figure 5-1: Knowledge points in Epistemic Plane

The nodes on this network represent potential research topics and the distance between nodes corresponds to the similarity of topics. Each node is in one of two states: an established (published) finding or a currently unknown (unpublished) fact. At a given point in time, each scholar is located at a particular node—i.e. her current focus in research. The links between nodes are bidirectional and constrain both the movement of scholars and the potential citations for new publication. The lattice is arranged on a torus, so the space is enclosed but without borders. Furthermore, there are no intrinsic differences in the value or importance of any research topic, they are all considered equally valuable. This representation is referred to as an “Epistemic Plane” as described in chapter 4. Refer to figure 4-2 and figure 4-3 to review the visual illustration of the model.

\[^{152}\text{I use a lattice to represent the epistemic plane for simplicity and illustration; any regular uniform connected network with bidirectional links could serve as an epistemic plane.}^\]
Table 5-1: Model Parameters

<table>
<thead>
<tr>
<th>Parameter, Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighborhood Size (NS)</td>
<td>The neighborhood size represents the range of nearby concepts or topics that a scholar would perceive. The neighborhood of a given point consists of all other points on the epistemic plane within the specified (Euclidian) distance. Neighborhood size of 3 consists of 28 patches and neighborhood size of 2 makes 12 patches.</td>
</tr>
<tr>
<td>Required Citation (RC)</td>
<td>Scholars are required to cite minimum number of published papers in the neighborhood, before publishing new knowledge.</td>
</tr>
<tr>
<td>Copyright Term</td>
<td>Copyright term is the number of cycles during the simulation that copyrighted papers remain as AL1 with limited access only to AL1 scholars.</td>
</tr>
<tr>
<td>Number of Scholars</td>
<td>Number of scholars determines how many scholars explore knowledge on the epistemic plain. The number of scholars remain unchanged during the simulation.</td>
</tr>
</tbody>
</table>

Results

In chapter 4, I measured the overall rate of publications and citations under various copyright term lengths to understand if changes in copyright term length may have any significant impacts on number of publications and citations. They also looked at both access-level-one and access-level-zero scholars separately in the model under various copyright term lengths to analyze how well each group of scholars perform in publishing new knowledge and receiving citations to their published articles. To analyze the impact of self-citations in knowledge creation, I did two separate analyses. 1) Scholars use self-citations to satisfy citation requirements to publish new papers, but did not receive credits for self-cited papers. 2) I modified the original model to exclude self-citation from counting toward fulfilling required citations for publication and
overall citation numbers.

I approximately ran 65,000 additional experiments with copyright term ranging between 0 and 200 cycles, with varying neighborhood sizes and citation requirements. The number of scholars in these experiments also varied ranging from 10 to 200 and scholars were randomly assigned an access level of one or zero.

*Self-Citation Allowed but not Credited*

In this analysis, I excluded self-cited papers from the credits scholars received in publishing new papers. The prevailing trend in most simulations was that increasing the copyright term resulted in decreased citation credits, similar to the trends in which self-citations were allowed (Figure 5-2). The reason for declining trend is related to access to copyrighted papers. Under shorter copyright protection regimes access to published articles goes up and scholars can more easily read and cite discovered knowledge and receive credit for their cited articles. The impact of increase in copyright cycles is more dramatic when the required citations are higher. For example, when eleven citations are needed, the number of citations from others drops by seventy percent. By increasing the required citations, the percentage of self-cited papers goes down as scholars increasingly need other works to cite to publish new papers. For example, in the scenario where the number of required citations is fewer than five, about 92% of cited papers are self-citations while the percentage drops to 45% when 11 papers are required to publish new knowledge.

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153 Here are copyright terms I explored in this agent based molding: [0, 1, 2, 5, 10, 20, 50, 100, 150, 200]. I ran the experiments with a series of neighborhood sizes and required citations: [(1,1), (1,2), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2), (3,3), (3,4), (3,5), (3,6), (3,7), (3,8), (3,9), (3,10), (3,11)].
Figure 5-2: Citations to other scholars’ research under various copyright terms

In addition to total non-self-citations, I looked at citing other researchers by access level one and access level two scholars. The overall trends are similar to the publication trends by AL0 and AL1 scholars in chapter 4. By extending the copyright term, the total credits given to other scholars’ research drops for both AL0 and AL1 scholars. However, when I removed self-citations from the graph, the difference between AL0 and AL1 citations was reduced under many copyright terms and citation requirements. In other words, self-citations resulted in more credits getting attributed to scholars with higher access to copyrighted materials hence more inequality in the system. Figure 5-3 compares the percentage of AL0’s contribution to citation when I look at total citations and when I exclude the self-citations. The closer the AL0’s contribution to 50% the less the inequality between scholars with higher and lower access to copyrighted materials is. The non-self citation line is above the total citation line in most of the
In chapter 4, I discovered scenarios where the extension of copyright terms modestly increased the total credits and citations attributed to scholars where fewer scholars were in the research field and citation requirements were low. When self-citations are removed from the graphs, the publication trends become declining. The division of labor effect that was contributing to a modest increase in total credits seems to be creating self-citations and not many credits to other scholars. This is no surprise since the division of labor provides an opportunity for scholars to spread more widely across the epistemic plane; therefore, they will have less access to other scholars’ research to cite. See Figure 5-4.
In chapter 4, after examining the effects of extending the copyright term on overall knowledge production, I looked at whether scholars themselves would prefer to publish open-access or copyrighted articles. In other words, I examined whether publishing copyrighted materials increased or decreased success for individual scholars. Controlling for access-level, scholars that published copyrighted papers systematically outperformed those that published open-access papers. In the same fashion, I ran a similar test on citation credits received by scholars who publish open access vs. those who publish under copyright protection, after excluding self-citations. The results are demonstrated in figure 5-5. Scholars are given randomly chosen access levels (0 = access to public domain articles, 1 = access to all published articles) and publishing habits (0 = publishing open access, 1 = publishing copyrighted) (50% for each) that were unchanged for the duration of the simulation. This creates four types of scholars: S00, S01, S10 and S11. The first number designating access level, the second designating publishing habit. In this new setting, among scholars who have lower access to knowledge, those who publish copyrighted still perform slightly better and are cited more frequently. However, the result is opposite for high access scholars. Publishing open access helps high access scholars and they perform moderately better in receiving citations from other scholars. Copyright hinders overall
knowledge production, and individual scholars with higher access to discovered knowledge who publish open access materials tend to do better.

Figure 5-5: Citations received by scholars with different publishing habit after excluding self-citations

It is important to point out that after excluding self-citations from the credits attributed to scholars, the impact of publishing habit is small on scholars with the same access level. The contribution of low access scholars with open access publishing habit varies from 40% to 49% under various copyright terms (1 cycle – 200 cycles). On the other side, the extension of copyright term incentivizes high access scholars to publish more open access (3% increase). Publishing habit impact was more significant when self-citations were credited to scholars and it incentivized both high and low access scholars to publish their papers under copyright protection. When all citations were credited, the contribution of those who published open access went down significantly from 41% to 21% by extending the copyright term from 1 cycle to 200 cycles. The contribution of high access scholars, who published open access, ranged from 38% to 44%.

Self-Citation Disallowed Entirely

Excluding self-citations from credits significantly impacted scholars with different publishing habits. However, it raises the question: what would happen to the results when self-citation is
disallowed and scholars could no longer count their own publications to satisfy minimum citation requirements in the model? After adjusting the model, the general declining trend of total credits by extending the copyright terms still holds. Moreover, both AL0’s and AL1’s credits generally decline by heightening the copyright protection. Under low citation requirement and few scholars in the field, I did not find the upward trend when copyright gets extended, similar to the setting where self-citations did not get counted towards total credits. The results are qualitatively similar to figure 5-4. Disallowing self-citation worsens inequality between high and low access scholars. This result is intuitive. If self-citation is disallowed, scholars with lower access will have fewer chances to find accessible articles to cite to satisfy citation requirements.

As the final test, I looked at how disallowing self-citation would impact the model in which scholars are assigned the publishing habit of open access or copyrighted papers. In the previous model where I did not count self-citations towards credits, the extension of copyright term helped low access level scholars who published under copyright, but hurt high access level scholars with the same publishing habit. When I disallowed self-citations, there was no significant difference between high access scholars who published open access and those who published under copyright. The impact on low access scholars was very modest too. AL0 scholars with the habit of publishing under copyright did slightly better (up to 3% under various copyright terms) than those who published open access.

Discussion

In chapter 4, I studied the impact of copyright term length on knowledge creation using agent based modeling. Self-citation was allowed, counted towards required citations, and credited as a measure of incentives for scholars. In this chapter, I analyzed the findings of the model in two parts when citations were allowed but not counted towards credits and when citations were not allowed in the model, meaning scholars could not use self-citations to satisfy minimum citation requirements to publish papers. The adjusted model allowed me to study the impact of self-
citations on knowledge production, citation credits, and scholars with different publishing habits. The scope of this research is limited to specifically scientific publications. So the findings of this research should not be generalized to all types of copyrighted subject matters.

The new findings confirm the results of the previous chapter where I concluded that the extension of copyright term hurts knowledge creation in most scenarios. The adverse effect of the extension is more prominent when scholars have to read (and therefore cite) more articles before publishing new knowledge. The results are similar for both types of scholars who have access to all published papers and those who can read and cite open access articles only. For both groups of scholars, the total credits had a downward trend when the term of copyright extended. Under the scenario where self-citations were not counted towards total credits, the difference in credits received by the two groups of scholars decreased in many cases. In other words, the exclusion of self-citations from credits improved equality in earning credits among scholars in epistemic plane. On the other hand, when self-citations were disallowed in fulfilling citation requirements, inequality became more significant as scholars with low access had fewer chances to meet citation requirements and publish papers.

In the model offered in the previous chapter, scholars were incentivized to publish copyrighted papers, as those scholars that published copyrighted papers systematically outperformed scholars who published open access. Copyright law simultaneously promoted the publication of copyrighted articles while decreasing the overall knowledge production. In other words, copyright law created an academic version of the tragedy of the commons. From this analysis I conducted in this chapter, it seems self-citations are the main driver of the academic tragedy of the commons. When I excluded self-citations from total credits attributed to scholars, publishing habit played very little role in incentivizing scholars. More importantly, high access scholars, who are responsible for generating the majority of credits, were modestly incentivized

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to publish open access, which was a total shift in the direction of incentives. In the model where self-citations were disallowed, publishing habit had very little or no impact on credits earned by scholars.

In the original model, I identified scenarios where copyright protection helped scholars moderately in generating new knowledge and slightly increased the rate of publications and citations. This phenomenon happened in epistemic planes with few scholars and under low citation requirements. I concluded that copyright protection created a division of labor in the epistemic plane allowing scholars more effectively explore their field without competition. After removing self-citations from total credits or disallowing self-citations to be counted towards citation requirements in publishing new papers, copyright protection no longer helps scholars to publish more papers and receive more credits.

As the findings of this chapter suggest, I recommend cutting copyright protection in most scenarios to increase access to published works. I would generalize this recommendation, assuming self-citation credits are not allowed in publishing new papers, which will not likely happen in real world. But it is fair to say that many academic institutions and scholars frown upon considering self-citations as normal academic credits.\textsuperscript{155} If self-citations are not counted toward scholars’ credits, extending copyright term does not promote credits gained from citations in general even in fields with few scholars and low citation requirements.

As mentioned earlier, to increase credits earned by scholars, the term of copyright protection should be reduced. In the absence of this policy, and if self-citations are allowed and counted towards credits, the epistemic plane will experience academic version of tragedy of commons. To help eliminate the tragedy of the commons problem, higher education institutions and other research institutions could decide to apply a policy to not count self-citations towards credits earned by scholars or minimally lower the weight of self-citations in their tenure evaluations,

\textsuperscript{155} Glänzel and Thijs.
promotion assessments, and research funding allocation. By applying such policy, as the findings of this research suggest, not only are scholars encouraged to publish open access, the credit gap between high and low access scholars will be reduced. Therefore, scholars in institutions with lower access to copyrighted materials will have a better chance to conduct research in epistemic plane and be recognized by their respective institutions.

In this chapter, I studied the impact of copyright term in earning citation credits by analyzing self-citation papers. However, the model has some limitations. Since self-citation increases the citations from others by three, there is no significant incentive penalty for frequent self-citers. Assuming scholars are credit maximizers, they will more likely cite their own articles to increase their citations in the long run. It will be interesting to include this logic into the model in future studies. Other limitations of this model are the same as described in Chapter 4.

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\(^{156}\) James H Fowler and Dag W Aksnes, "Does Self-Citation Pay?," ibid. 72 (2007).
Chapter 6: Conclusions and Policy Discussions

As we learned from the discourse analysis of Copyright Term Extension Act of 1998, the proponents of the bill found a policy window\textsuperscript{157} to demand extension to the copyright term after the European Union introduced 20 more years of copyright protection for its member countries. Motivated by the European copyright extension, Congress invited 65 witnesses, mostly from the entertainment industry, to testify in the House and the Senate. The proponents of the extension mainly offered economic based rationales when testifying during the hearing sessions held by Congress.

The supporters of the copyright term extension frequently brought up rationales that were based on macroeconomic reasoning. The macroeconomic rationale was an appealing argument to the members of Congress as this rationale tied the passage of the copyright extension to the improvement of the U.S. economy, job creation, and creating trade surplus for the nation. The appeal of the rationale was stronger especially when the speakers framed it in the context of losing the economic benefits to European nations and beyond. The witnesses presented stories and more specifically “stories of decline”\textsuperscript{158} to portray the unfair treatment of American music and movies as a whole in Europe and convince Congress to extend the copyright term.

The supporters also framed the copyright extension as a fairness issue, i.e., microeconomic issue to American right holders who would lose the economic fruits of their intellectual properties to European countries due to the rule of shorter term. The proponents of the extension argued the heirs of the right holders, and more specifically the second generation of the heirs, would likely lose the economic benefits of the protected work if the copyright term stayed at 50 years after the death of the copyright holder. The supporters of the copyright term did not directly mention

\textsuperscript{157} According to Kingdon, when the streams of the issue, policy and politics join and get aligned, the policy window opens for the advocates of proposals to push their policy solutions forward. See John Kingdon, \textit{Agendas, Alternatives, and Public Policy}. (London: Longman, 2003), 165 - 194.

\textsuperscript{158} The stories of decline run like this: “In the beginning, things were pretty good. But they got worse. In fact, right now, they are nearly intolerable. Something must be done.” Deborah Stone, “Symbols” in \textit{Policy Paradox: The Art of Political Decision Making}. (New York: Norton, W. W. & Company Inc.,2011)
microeconomic benefits of the extension for corporations that hold copyrights and constrained themselves to only referencing the macroeconomic benefits of those rights for the individual songwriters and artists. In the discourse, supporters made no reference to securing the economic benefits of companies such as Disney, many of whose works would have entered into the public domain had the CTEA not passed. In my opinion, this intentional obfuscation helped the supporters of the extension to better frame the bill as a fairness issue and successfully pass the law.

It is important to note that there was no meaningful direct reference to promoting knowledge creation as the result of extending the copyright term in the discourse of congressional hearings and floor debates. The direct reference came from the Registrar of the Copyright who acknowledged that the extension would create negative impacts on libraries and scholars who try to access the protected materials and asked for some exemptions for learners. Despite the negative impact of the extension on libraries, the Registrar supported the extension.¹⁵⁹

Copyright scholars, who participated as witnesses during the hearing sessions held for CTEA, opposed the extension of copyright term. They rationalized why the extension would not incentivize the creation of new works, it would not effectively support two generations of authors’ heirs, and it would not harmonize U.S. copyright law with EU’s. Professor Jaszi mentioned the primary claim of the supporters of the extension i.e. raising financial benefits for the copyright owners has no place in the analytic framework of copyright law to achieve general social benefits in the United States, and the U.S. law is designed as a mean to achieve social benefits unlike the Europe copyright law that is rooted in a natural right.

We learned from the literature, in its pure form, “All men by nature desire to know.”¹⁶⁰ Social epistemologists and philosophers of science extended this idea and concluded that credit,

¹⁵⁹ U.S. Congress, House of Representative, Copyright Term, Film Labeling, and Film Preservation Legislation, 162.
¹⁶⁰ Aristotle
respect and honor can also motivate scholars and scientists to create knowledge and publish papers. However, there was no significant reference to these motivations by the supporters of the Copyright Term Extension Act during the floor debates and the congressional hearing sessions as a rationale to extend the copyright term. And, these ideas and motivations did not get formulated into copyright law. The speakers during the House and the Senate debates and the witnesses at the hearing sessions offered micro and macro-economic rationales in support of the extensions, but as Peter Jaszi articulated, no matter how appropriate those rationales might be in the context of European national legal traditions, they have no bearing on U.S. copyright policymaking as they do not encourage knowledge creation and learning.

Copyright Term Impact on knowledge Creation – Mathematical modeling

After conducting the discourse analysis on the discussions related to passage of Copyright Term Extension Act, I designed mathematical models to simulate an epistemic landscape to quantitatively study the impact of longer and shorter copyright regimes on knowledge creation. The scope of this research was limited to literary works and more specifically scientific publications. The findings of this research should not be generalized to all types of copyrighted subject matters. Based on the findings of the mathematical simulations, the extension of copyright term generally hurts knowledge creation in most scenarios. The adverse effect of the extension is more prominent in fields where scholars have to read and cite more articles before publishing new knowledge. The extension of the copyright term does not hurt only those who have lower access levels. It hurts all scholars in the epistemic plane and the impact is more significant when more researchers are in the field.

When scholars were incentivized to publish copyrighted papers, scholars who published copyrighted papers systematically outperformed scholars who published open access. Copyright law simultaneously promoted the publication of copyrighted articles while decreasing the overall knowledge production. In other words, copyright law created an academic version of the tragedy
of the commons.\textsuperscript{161}

Self-citations are the main driver of the academic tragedy of the common. When I excluded self-citations from total credits attributed to scholars, publishing habit played very little role in incentivizing scholars. The exclusion of self-citations from credits improved equality in earning credits among scholars in epistemic plane. On the other hand, when self-citations were disallowed in fulfilling citation requirements, inequality became more significant as scholars with low access had fewer chances to cite to meet citation requirements and publish papers. The mathematical simulations suggest that cutting copyright protection would increase access to published works. I would generalize this recommendation, assuming self-citation credits are not allowed in the publishing new papers. This does not likely happen in real world, but it is fair to say that many academic institutions and scholars frown upon considering self-citations as normal academic credits.\textsuperscript{162} If self-citations are not counted toward scholars’ credits, extending copyright term does not promote credits gained from citations in general even in fields with few scholars and low citation requirements.

Grassroots Responses to Copyright Extension

Activists, scholars, universities, and librarians have initiated grassroots projects and activities to reduce the adverse effects of the lengthy copyright term in the U.S. In the presence of a highly limiting copyright law and to benefit the public domain, authors opt not to exercise their full copyright privileges by voluntarily giving rights to public to their works. Open Access and Creative Commons are two of the main projects that were created to give access to published works.

Creative Commons

Two years before representing Eric Eldred in Eldered v. Ashcroft Supreme Court case in 2003

\textsuperscript{161} Garrett Hardin, "The Tragedy of the Commons," \textit{Science} 162, no. 3859 (1968).
\textsuperscript{162} Wolfgang Glänzel and Bart Thijs, "The Influence of Author Self-Citations on Bibliometric Macro Indicators," \textit{Scientometrics} 59, no. 3 (2004).
challenging the Copyright Term Extension Act of 1998, Lawrence Lessig founded a nonprofit organization called Creative Commons to promote public domain and open access publishing. The organization released new copyright licenses known as Creative Commons licenses giving options to authors to legally publish more accessible works. Unlike copyright license, Creative Commons licenses offer a range of options to authors. The most relaxed license lets users to distribute, remix, tweak, and build upon author’s work even commercially as long as they credit the original work. The most restrictive license only allows others to download the work and share it with others as long as crediting the author. Creative Commons is a legal tool for the copyleft movement that seeks to build a richer public domain.

The number of Creative Commons licensed works have been rapidly growing. In 2016, over 1.2 billion works were reported with Creative Commons licenses. The number was 140 million in 2006. More impressively, 65% of those works are shared under “Free Culture” licenses. However, challenges remain related to Creative Commons licensing. Difficult to understand licensing options and passing works under copyright to public domain using creative common license (either intentionally or unintentionally due to lack of understanding) are yet to be solved.

**Open Access Project**

On February 14, 2002, with the goal of making research free and available to anyone with a computer and the Internet, the signatories of the Budapest Open Access Initiative released a public statement recommending two strategies to achieve open access to scholarly journal

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163 “Copyleft is a general method for making a program (or other work) free, and requiring all modified and extended versions of the program to be free as well.” Quoted from https://www.gnu.org/licenses/copyleft.en.html
164 https://stateof.creativecommons.org
165 define free culture (CCo, CC by, CC by SA, other public domain tools)
166 Leslie Chan, Bioline International; Darius Cuplinskas, Open Society Institute; Michael Eisen, Public Library of Science; Fred Friend, University College London; Yana Genova, Next Page Foundation; Jean Claude Guedon, University of Montreal; Melissa Hagemann, Open Society Institute, Stevan Harnad, University of Southampton; Rick Johnson, Scholarly Publishing and Academic Resources Coalition; Rima Kupryte, Open Society Institute; Manfredi La Manna, Electronic Society for Social Scientists; Istvan Rev, Open Society Archives; Monika Segbert, eIFL Project; Sidnei de Souza, CRIA; Peter Suber, Earlham College; Jan Velterop, Biomed Central
literature. Budapest Open Access Initiative recommended creating archiving tools and
instructions for scholars to self-archive their refereed journal articles in open electronic
archives. The initiative also recommended establishing open access journals allowing scholars
publish their articles in journals that would no longer invoke copyright to restrict access to and
use of the material they publish. They recommended establishing funding methods other than
subscription or access fee for these open access journals. The Open Society Institute provided
the initial help and funding to meet the established goals.

Instead of seeking change to copyright law, the supporters of open access projects focused their
energy on building a grassroots movement to promote self-archiving and publishing in open
access journals among scholars. The movement has been relatively successful. The number of
open access repositories (self-archiving) have increased from 310 in 2016 to over 3400 in
2017.167 Many universities, including large public and private institutions in the U.S. and across
the globe, developed policies and infrastructures to allow faculty to publicly share papers.
Despite universities’ efforts to build the repositories for their scholarly communities, not all
scholars make their works available on the repository. For instance, only 25% of scholars at
University of California put their papers into the state-created repository. Some universities,
such as Harvard University, have created offices to educate faculty and go door to door to
promote upload to the repositories and overcome the inertia against change. However, for larger
universities, such as University of California, with over 50,000 employees, this idea may not be
scalable.168

The number of open access journals currently available on the Directory of Open Access

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s/237044
Journals are over 9,900 with more than 2.5 million articles. The scholarly Publishing and Academic Resources Coalition recommended the following next steps in expanding open access publications:

- Develop general policy and infrastructure alignment among research funders, government agencies, and academic institutions.
- Research funders should use the levers to promote open access.
- Open access policies should stress the benefits of openness on better discovery and more efficient scholarly and scientific activities.
- Invest in infrastructure and workflows to disseminate research widely and efficiently.

The open access journals are typically funded in one of the following three forms:

- Those that do not charge the authors nor readers.
- Those subsidized by research funding organizations and supported by nationally funded portals.
- Those that charge Article Processing Charge (APC) often in the range of $500-$2000 to authors.

Although open access journals have increased significantly in recent years, many challenges remain to be addressed. Peter Suber, one of the signatories of the Budapest Open Access Initiative and the author of the book Open Access points to the challenges that threatens open access journals. Some of those are the challenges that new journals have to deal with. For instance, the most widely-used measure of journals quality (Impact Factor) discriminates against new journals and the scholarly community doubts about quality, honesty and sustainability of OA journals. Equally important, OA offers free to read but nothing more. Peter

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Suber explains why it is important to offer more access to users. He references activities such as burning copies on CDs, printing full-text copies, emailing copies to students or colleagues, distributing semantically-tagged or otherwise enhanced versions of a text, migrating copies to new formats or media to keep a text readable as technologies change, archiving copies for preservation that remain banned under copyright law. He recommends all members to publish with CC-BY licenses under Creative Commons to help providing the true public domain access to scholarly works and help promote science. 172

Policy Recommendation

Are these grassroots movements the right solutions to overcome copyright law barriers and promote knowledge creation and learning? Projects such as Creative Commons and Open Access contributed to the expansion of public domain. According to the results of the agent based modeling, open access and public domain promote knowledge creation. The grassroots movements discussed above manifest the reality that scholars face serious impediments to generate and disseminate knowledge in the presence of the current copyright law. These projects are the manifestation of a public outcry calling for copyright law reform to restore the original purpose of the law that the founders considered in granting copyright protection.

The question remains why Congress should uphold a copyright law that does not promote knowledge creation and learning, the goal envisioned by the Constitution for this law. Assuming the copyright extension promotes copyrighted materials in the entertainment industry, policymakers should explore decoupling scholarly works from entertainment materials. De-bundling scholarly works from the entertainment industry will allow lawmakers to design targeted and effective policies that promote knowledge creation and learning for all types of copyrighted materials.

Needless to say the de-bundling of the scholarly works from entertainment requires further research. Here are few questions that need to be answered in future research: How should we draw lines between scholarly works and entertainment works? How do we categorize art works such as paintings? How should the supporters of the de-coupling mobilize against publishing companies who will lobby aggressively against the passage of such law? How can this change help the textbook industry to move into 21st century and help students learning?

The expansion of open access journals and scholarly repositories managed without the help of major publishing companies are testimony to the fact that scholars and institutions to which they belong are fully capable of being the custodians of publication and dissemination of scholarly works, especially since the Internet and information technology solutions have made near zero storage and communication cost of the information possible. With reasonable investment by knowledge producing institutions such as universities, there will be no need to copyright protection for scientific publications.

In the absence of investment in repositories by knowledge producing institutions, lean nonprofit organizations can be created to take over the publication, storage and dissemination of scholarly works. In this scenario, there will be a need for some revenue streams for the nonprofit organizations. One option to generate revenue for the nonprofits is copyright protection. However, given such organizations will not have a profit maximization mission, with a short period of copyright protection, the expenses of the nonprofits can be covered. Alternatively, the federal government can pay for the operational expenses of the nonprofit, and those expenses will be absorbed by the Library of Congress or the National Science Foundation to promote knowledge creation and innovation and ultimately stimulate economy. Further research will be required to study the financial impact establishing those lean nonprofit organizations.

In the absence of copyright law for scientific works, there will still be opportunities for for-profit sector to contribute to knowledge creation and learning and make profit. Technology is
transforming learning. The emergence of new fields such as data visualization, 3d modeling and artificial intelligence can significantly improve the learning process. This is an area where for-profit companies can offer their innovative solutions in the form of subscription to learners. For-profits can collaborate with authors to create the next generation of textbooks for schools and higher education learners. Saving money from high scientific journals subscription fees, higher education institutions may commission data visualization companies to support their scholars to present their works more effectively and make them more visible and comprehensible for their audiences. They can support analytical infrastructure necessary to connect scholars to collaborate across the globe.

Future studies

In this dissertation, I initiated a dialogue in support of modifying copyright law to promote the creation of knowledge and learning in society. Further research is required to look at the impact of copyright extension on entertainment industry and compare it to the impact on scholarly research. I took the first step towards modeling the impact of copyright term on knowledge creation. The models simulate few but essential concepts of knowledge creation in scientific fields to keep the model simple and robust. However, the model also has some important limitations and idealizations that warrant a brief discussion. For instance, I did not include any stakeholders beyond scholars in the model. Scholars are also represented as relatively simple decision-makers that aim to produce publications in a relatively short-sighted manner. Expanding the model to include entities like publishing companies and universities and track financial incentives for publishing companies is a natural step for future research. Additionally, the epistemic plane has been portrayed as a simple uniform network, which may not be the case. It is possible that the epistemic structure of specific research fields may impact the role that copyright protection plays in helping or hindering knowledge creation. Thus, other, irregular or more complex networks of research topics should also be examined. I encourage scholars to explore legislation to decouple copyright protection for works generated by scientific world from
works produced by entertainment industries, and build a legal system that addresses the promotion of science in the age of Internet and near zero publication cost.
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