

Government as Owner of Intellectual Property? Considerations for Public Welfare in the Era of Big Data

*Ruth L. Okediji**

ABSTRACT

Open government data policies have become a significant part of innovation strategies in many countries, allowing access, use and re-use of government data to improve government transparency, foster civic engagement, and expand opportunities for the creation of new products and services. Rarely, however, do open data policies address intellectual property rights that may arise from free access to government data. Ownership of knowledge goods created from big data is governed by the default rules of intellectual property laws which typically vest ownership in the creator/inventor. By allowing, and in some cases actively encouraging, private capture of the downstream goods created as a result of open data policies, governments may fail to appropriate optimal returns to the public for its investment in big data. This Essay argues for coherence between open data policies and rules governing government ownership of intellectual property. It highlights the rule in US copyright law proscribing copyright in federal government works, arguing that public domain status is not invariably welfare-enhancing. The rule is sufficiently malleable to permit the federal government to assert ownership over knowledge assets developed from access to data that it owns or controls. Claiming copyright to engineer greater protection of the public interest could foster economic growth and facilitate the distributive welfare goals of intellectual property law more effectively than the public domain status that presumptively attaches to federal government works.

* William L. Prosser Professor of Law, University of Minnesota Law School. This Article is based on my presentation at the VANDERBILT JOURNAL OF ENTERTAINMENT & TECHNOLOGY LAW 2014–15 Symposium *Beyond Regulation: The US Government as Funder, Creator, and User of Intellectual Property*. I am grateful to Wendy Gordon and Paul Uhlir for comments on an earlier draft, to Jerome Reichman for discussions about some of the ideas in the Essay, and to participants at the symposium for their questions and input.

TABLE OF CONTENTS

I. INTRODUCTION	332
II. GOVERNMENT OWNERSHIP OF INTELLECTUAL PROPERTY IN HISTORICAL PERSPECTIVE	337
A. <i>Historical Antecedents</i>	340
B. <i>The Statutory Baseline for Government Ownership of Copyright</i>	343
C. <i>Access Despite Ownership</i>	347
III. EMERGING PROSPECTS FOR ENHANCING WELFARE IN A DATA-DRIVEN DIGITAL ECONOMY	349
A. <i>Government Licensing and Crown Copyright in the United Kingdom</i>	349
B. <i>Creative Commons Licenses and Crown Copyright in Australia</i>	353
C. <i>To Own or Not to Own? Does the Statutory Default Rule Matter?</i>	354
IV. INTELLECTUAL PROPERTY-RELATED CONSIDERATIONS FOR A DIGITAL WELFARE STATE	356
A. <i>Models for Regulating Access to Government Data and Downstream Creativity</i>	356
1. Pure Open-Data Model	356
2. Conditioned Open-Data Model	358
3. Proprietary Model.....	359
B. <i>Considerations on the Way Forward</i>	360
V. CONCLUSION	361

I. INTRODUCTION

Governments all over the world generate, collect, and thus own massive amounts of data. Determining what policies best regulate access to and use of the ever-increasing volume, velocity and variety¹ of data—so-called “big data”¹—to serve the public welfare is one of the central challenges governments face today. Governmental and private

1. “Technologists often use the technical ‘3-V’ definition of big data as ‘high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making.’” Neil M. Richards & Jonathan H. King, *Big Data Ethics*, 49 WAKE FOREST L. REV. 393, 394 (2014) (quoting *IT Glossary: Big Data*, GARTNER, <http://www.gartner.com/it-glossary/big-data/> [https://perma.cc/82MT-KRHU]); see *id.* (citing Doug Laney, *3D Data Management: Controlling Data Volume, Velocity, and Variety*, GARTNER (Feb. 6, 2011), <http://blogs.gartner.com/doug-laney/files/2012/01/ad949-3D-Data-Management-Controlling-Data-Volume-Velocity-and-Variety.pdf> [https://perma.cc/Z4SK-YJEP]).

researchers increasingly have a wide range of tools available to engage in big data analytics. New sampling techniques, satellite instruments, microchip arrays, and dynamic software platforms have enabled scientists to analyze and apply information—e.g., scientific, medical, environmental—generated from a wide array of data sources, both private and public, in seeking answers to national and global challenges.² New knowledge and insights derived from big data may offer solutions and inform important research trajectories in a variety of areas.³ Proper analysis of scientific data could, for example, improve public health by more finely identifying causal links between demographic information and incidences of cancer or other disease;⁴ data on climate change and biodiversity can help predict future disruptions in agricultural markets, allowing governments to plan well in advance.⁵ In biology, big data has enormous potential in

2. This massive amount of data has prompted many projects that seek to utilize and study it in a plethora of ways. *See, e.g.*, M. van Rijmenam, *Understanding the Various Sources of Big Data—Infographic*, DATAFLOQ, Nov 7, 2015, <https://datafloq.com/read/understanding-sources-big-data-infographic/338> [<https://perma.cc/75B5-8LPJ>] (depicting the major sources of big data: archives, documents, media, business applications, social media, public web, data storage, machine log data, and sensor data); Z.D. Stephens, S.Y. Lee, F. Faghri, R.H. Campbell, C. Zhai, M.J. Efron, et al., *Big Data: Astronomical or Genomical?*, 13(7) PLOS BIOL. (2015), <http://www.plosbiology.org/article/doi/10.1371/journal.pbio.1002195&representation=PDF> [<https://perma.cc/U8GZ-C3W6>] (comparing four major generators of big data, including genomics, astronomy, YouTube, and Twitter).

3. *See, e.g.*, MCKINSEY GLOBAL INST., *BIG DATA: THE NEXT FRONTIER FOR INNOVATION, COMPETITION, AND PRODUCTIVITY* (2011), http://www.mckinsey.com/~media/McKinsey/dotcom/Insights%20and%20pubs/MGI/Research/Technology%20and%20Innovation/Big%20Data/MGI_big_data_full_report.ashx [<https://perma.cc/NH6X-AJ3A>] (defining “big data” and its transformative potential across various sectors); D. BOLLIER, *THE PROMISE AND PERIL OF BIG DATA* (Aspen Inst., 2010), http://www.aspeninstitute.org/sites/default/files/content/docs/pubs/The_Promise_and_Peril_of_Big_Data.pdf [<https://perma.cc/K9YW-HZZ8>] (discussing the “new era of Big Data” and its implications for business, government, democracy, and culture).

4. *See, e.g.*, L. Ramsey, *Cancer Treatment Is on the Brink of a Data Revolution*, BUSINESS INSIDER, Sep. 22, 2015, <http://www.businessinsider.com/big-data-and-cancer-2015-9> [<https://perma.cc/KX4F-F6UE>] (“Big data isn’t just increasing the potential for what oncologists can do with the information from hundreds of thousands of patients. Faster genetic sequencing technologies are also helping companies find easier ways to track cancer treatments at a genetic level.”); B. Marr, *How Big Data Is Transforming The Fight Against Cancer*, FORBES, Jun. 28, 2015, <http://www.forbes.com/sites/bernardmarr/2015/06/28/how-big-data-is-transforming-the-fight-against-cancer/> [<https://perma.cc/9F4J-BAYY>] (“Big Data is being put to use in many ways to aid the task of improving care, identifying risks and hopefully eventually producing cures.”); Case Western Reserve University School of Engineering, *Using Big Data to Identify Cancers*, <http://engineering.case.edu/big-data-cancer-ID> [<https://perma.cc/H9PW-WUXL>] (describing a research project which used big data “to predict if a patient is suffering from aggressive triple-negative breast cancer, slower-moving cancers or non-cancerous lesions with 95 percent accuracy”).

5. *See, e.g.*, H. Clark, *How Big Data Is Helping Farmers Save Millions*, GIZMAG, Oct. 27, 2014, <http://www.gizmag.com/big-data-crops-climate-change/34400/> (discussing a computer program analyzing weather data to improve crop yields); L. Del Bello, *Big Data to Help Coffee Farmers Adapt to Eliminate Change*, SCIDEVNET, May 14, 2015,

allowing scientists to move from hypotheses to working with actual models built from the information collected and mined from data banks.⁶ Better science and improved treatment methods can emerge from data generated by the US healthcare system.⁷ In short, big data—and the algorithmic tools that allow use of the data transformatively—is a critical new frontier and resource for innovation.

What should be the role of governments in controlling these vast troves of information that many believe hold answers to various contemporary problems? In the US, under the venerable rule in *Feist*, now well-established in international law, facts are not eligible for copyright protection.⁸ Thus, in theory, anyone may access and use/reproduce the data⁹ collected by the federal government without violating copyright law. This may appear to eliminate any copyright barriers (but not those barriers stemming from contract, digital locks or other regulations) to the use of big data.

But simply *accessing* data is not where the innovative value lies—it is in mining, learning from, and applying the new information such data yields to create new products that enhance human welfare. In the downstream application of data or the knowledge derived therefrom, copyright rules may matter a great deal. For example, use of the data may result in copyrightable works such as scientific articles or computer applications. In addition, building “data commons” that link databases across related scientific fields is a

<http://www.scidev.net/global/biodiversity/multimedia/big-data-coffee-farmers-climate-change.html> [<https://perma.cc/7U86-REJK>] (describing “software that combines satellite images with big data on agricultural production, in an effort to support farmers in their [climate] adaptation efforts”).

6. See, e.g., M. May, *Big Biological Impacts from Big Data*, SCIENCE, Jul. 13, 2014, http://www.sciencemag.org/site/products/lst_20140613.xhtml [<https://perma.cc/NW64-G8J9>] (“Tools and techniques for analyzing big data promise to mold massive mounds of information into a better understanding of the basic biological mechanisms and how the results can be applied in, for example, health care.”); V. Marx, *Biology: The Big Challenges of Big Data*, 498 NATURE 255 (2013), <http://www.nature.com/nature/journal/v498/n7453/full/498255a.html#ref2> [<https://perma.cc/V4CK-V5VP>] (“Harnessing powerful computers and numerous tools for data analysis is crucial in drug discovery and other areas of big-data biology.”).

7. See, e.g., B. Kayyali, D. Knott & S. Van Kuiken, *The Big-Data Revolution in US Health Care: Accelerating Value and Innovation*, MCKINSEY & COMPANY, Apr. 2013, http://www.mckinsey.com/insights/health_systems_and_services/the_big-data_revolution_in_us_health_care [<https://perma.cc/5Z4V-3SB4>].

8. *Feist Publications, Inc. v. Rural Telephone Service Co.*, 499 U.S. 340 (1991). See also Daniel J. Gervais, *Feist Goes Global: A Comparative Analysis of The Notion Of Originality In Copyright Law*, 49 J. COPYRIGHT SOCIETY OF THE USA 949 (2002); TRIPS Agreement, Art. 10 (2).

⁹ OMB Circular A-130 provides guidance on this to federal agencies. Executive Office of the President, Office of Management and Budget (OMB), Circular No. A-130, Revised: Management of Federal Information Resources, Transmittal Memorandum No. 4 (Nov. 28, 2000), 2000 WL 33969135, https://www.whitehouse.gov/omb/circulars_a130_a130trans4/ [<https://perma.cc/EQ6A-XFXP>].

crucial aspect of advancing the progress of science; such cross-linkages may generate particular original selections or compilations of data that are subject to copyright protection.¹⁰ Moreover, simply adding an analysis to a data set means the resulting collective work would also attract copyright protection and trigger the full array of copyright and para-copyright rights under the Digital Millennium Copyright Act (DMCA).¹¹

Section 105 of the 1976 US Copyright Act prohibits copyright in works of the federal government.¹² The public domain status of federal government works is a deliberate policy choice justified in reference to the public interest although, as described below, there are important exceptions to the rule. With respect to big data, it is easy to assume that the public interest is also best supported or advanced simply by adopting a policy of “open data”—making government-collected or created data freely available. And just like the default rule for prohibition of copyright in federal government works, there are important reasons to have a firm commitment to open data.¹³ Indeed, we are already seeing important innovation coming from cities that have adopted an open-data approach.¹⁴

However, with its unrivaled capacity to generate big data and to control the data generated by others, the US government has an important opportunity to shape the extent to which the public benefits

10. See Jerome H. Reichman & Ruth L. Okediji, *When Copyright Law and Science Collide: Empowering Digitally Integrated Research Methods on a Global Scale*, 96 MINN. L. REV. 1362 (2012).

11. See Digital Millennium Copyright Act [DMCA], § 1201, Pub. L. No. 105-304, 112 Stat. 2860 (1998); see also Daniel J. Gervais, *The Protection of Databases*, 82 CHI.-KENT L. REV. 1109 (2007); Jane C. Ginsburg, *Creation and Commercial Value: Copyright Protection of Works of Information*, 90 COLUM. L. REV. 1865 (1990).

12. Copyright Act, 17 U.S.C. § 105 (2012).

13. See OMB Circular A-130 *supra* note 9. See also Paul F. Uhlir, *The Value of Open Data Sharing*, International Council for Science (ICS) Committee on Data for Science and Technology (CODATA), Version 1 (Nov. 2015), https://www.earthobservations.org/documents/dsp/20151130_the_value_of_open_data_sharing.pdf [<https://perma.cc/J6SB-GCW2>].

14. See, e.g., J. Hamill, *Could Google Maps End Poverty?*, FORBES, Jan. 28, 2014, <http://www.forbes.com/sites/jasperhamill/2014/01/28/could-google-maps-help-end-poverty/> [<https://perma.cc/K2JE-QCWH>] (discussing the “Transparent Chennai” program, which digitally mapped slums in the Indian city of Chennai and led to improvements in the delivery of social services); *New City Crime Database Goes Online*, CHICAGO TRIBUNE, Sep. 14, 2011, <http://www.chicagotribune.com/news/local/breaking/chi-new-city-crime-database-goes-online-20110914-story.html> [<https://perma.cc/2H2R-DHBC>] (announcing the publication of an online searchable database of crime incident reports in Chicago, allowing “residents to evaluate their own neighborhoods, academics to study crime and techie types to create websites or apps”); Z. Tumin, *New York’s HHS-Connect: IT Crosses Boundaries in a Shared-Mission World*, GOVERNING.COM, Aug. 24, 2009, <http://www.governing.com/blogs/bfc/New-Yorks-HHS-Connect-IT.html> [<https://perma.cc/WBY7-7NWT>] (outlining the benefits of New York City’s “HHS-Connect,” an integration platform facilitating “cross-boundary reform of the social services domain”); GOLDSMITH & CRAWFORD, *infra* note 21.

from the “data deluge” and the innovation potential that such data offers. This will require more than just open-data policies. It may also require reconsideration of copyright’s ownership rule for federal government works.

This Essay explores the role of the government in facilitating the proverbial intellectual property (IP) balance, not only as a legislator and enforcer of IP laws and their limits, but also as a market participant in the ownership of inputs critical to the creation of knowledge goods. I suggest that the innovation potential and economic value of big data should compel a more considered and possibly different set of copyright ownership rules.

Access to data by as many users as possible is necessary to maximize dynamic and rapidly evolving forms and avenues of innovation characteristic of the digital age. To this end, open data policies are a great starting point. Such policies should, however, be linked to terms and conditions that facilitate optimal access to copyrighted works that may result from applications of insights and knowledge gained from big data. What is required are appropriate links between policies that regulate government ownership of data and the rules of copyright ownership for government works, including works created in whole or in part with government funding. The legislative history of the 1976 Copyright Act emphasizes government flexibility, supporting the argument that there is room to reconsider the current statutory default rule for federal government works. Moreover, some of the justifications that underlie the public domain status of most federal government works apply with equal force to federal government ownership in downstream goods created as a result of its open access policies namely, that the public has already paid at least partially for the creation of those goods.

Part II of this Essay reviews the nature and scope of copyright ownership in government works. It highlights the well-known relationship between government and rights holders, foreshadowing the highly dysfunctional legislative process that enables the compromises that have persistently endangered the public welfare objectives of the IP system.¹⁵ Part III examines how some foreign governments have embraced a more explicit role in assuring access to government-owned data and copyrighted works by adopting access

15. Jessica Litman’s foundational work on copyright’s legislative history is the leading analysis of how the government’s core policy function has been consistently delegated to stakeholder industries. See Jessica D. Litman, *Copyright, Compromise, and Legislative History*, 72 CORNELL L. REV. 857 (1987); see also Jessica D. Litman, *The Exclusive Right to Read*, 13 CARDOZO ARTS & ENT. L.J. 29, 33 (1994) (“Congress, for its part, has, since the turn of the century, been delegating the policy choices involved in copyright matters to the industries affected by copyright.”).

models that work around existing rules that vest copyright in government works. I point out that a baseline rule of government ownership of IP rights does not necessarily impair or impede prospects for strengthening public access to knowledge goods and innovation, any more than a public domain baseline rule ineluctably advances the public welfare.

Finally, Part IV draws conclusions about the role of government in view of contemporary challenges in intellectual property law. I suggest three possible models for regulating data and downstream creativity notwithstanding which default rule of copyright ownership a national government adopts.

II. GOVERNMENT OWNERSHIP OF INTELLECTUAL PROPERTY IN HISTORICAL PERSPECTIVE

Section 105 of the US Copyright Act expressly precludes federal government claims of copyright ownership in its works.¹⁶ This classic rule is, however, subject to exceptions that in reality make US government ownership of copyrightable works legally feasible and common. The legislative history of § 105 states that Congress deliberately avoided “making any sort of outright, unqualified prohibition against copyright in works prepared under Government contract or grant” for the same public interest justifications underlying the public domain status of federal government works.¹⁷ For example, a federal contractor may choose to assign her copyright interest in any protected work resulting from the use of government-owned data to the government.¹⁸ The federal government may condition certain grants or other funding on the grantee

16. See Copyright Act *supra* note 12.

17. See H.R. REP. No. 94-1476, at 59 (1976). (“A more difficult and far-reaching problem is whether the definition should be broadened to prohibit copyright in works prepared under U.S. Government contract or grant. As the bill is written, the Government agency concerned could determine in each case whether to allow an independent contractor or grantee, to secure copyright in works prepared in whole or in part with the use of Government funds.) A work produced by a government contractor is subject to copyright protection, although the rules differ between civilian contracts and those in the National Aeronautics and Space Administration (NASA) or the military. See *Frequently Asked Questions About Copyright*, COMMERCE, ENERGY, NASA, & DEF. INFO. MANAGERS GRP. [CENDI] 4.1 (Oct. 8, 2008), <http://www.cendi.gov/publications/04-8copyright.html> [<http://perma.cc/9SDA-QCMQ>].

18. 17 U.S.C. § 105 (2012); see also CENDI, *supra* note 17, at 4.5 (“The Government is not precluded from receiving and holding copyrights transferred to it by assignment. A Copyright assigned or otherwise transferred to the Government does not lose its copyright status or protection. The Government may record transfers of copyright with the U.S. Copyright Office and may register copyrights transferred to it.”).

providing a royalty-free government license that allows the public use of any resulting copyrightable work.¹⁹

The flexibility to design policies related to IP ownership is arguably greater with state governments. There is no proscription for state or local government ownership of copyright; state and local governments can—and do—assert ownership in their works despite strong intuition that the same considerations that inform the default rule codified in § 105 apply equally to state government works.²⁰ In short, despite the official rule, governments at all levels can structure rules that enhance or diminish their ownership interests in copyrighted works. This is especially the case with state and local governments, many of which are already experimenting with how to more effectively enhance public welfare through applications of big data in areas such as education, transport, crime prevention, sanitation, land management, and others.²¹ Many of these efforts generate copyrightable software applications, compilations, computer models and other literary works. Copyright ownership of these works will determine how optimally the government can address distributional justice issues using these goods directly in its provision of services to the community, or by promoting optimal access to the goods by less privileged members of society. So what is the copyright ownership status of such works? The answer is surprisingly unclear.

In cases where the work was created by a state employee acting within the scope of her employment, there is a strong argument

19. Certainly some agencies require grantees to make scholarly works developed from grants freely available. See H.R. REP. NO. 94-1476, at 59 (1976).

For more related discussion, see *infra*, Part III.

20. CENDI, *supra* note 17, at 3.1.3 (“State and local governments may and often do claim copyright in their publications. It is their prerogative to set policies that may allow, require, restrict or prohibit claim of copyright on some or all works produced by their government units.”). A lawsuit challenging copyright ownership in state laws currently is making its way through the courts. See American Society for Testing and Materials d/b/a ASTM Int’l, et al. v. Public.Resource.org, Inc. Civil Action No. 1:13-cv-01215-TSC (US District Court, District of Columbia), <https://dockets.justia.com/docket/district-of-columbia/dedce/1:2013cv01215/161410> [<https://perma.cc/J6SB-GCW2>].

21. See, e.g., S. GOLDSMITH & S. CRAWFORD, THE RESPONSIVE CITY: ENGAGING COMMUNITIES THROUGH DATA-SMART GOVERNANCE (2014) (using case studies from New York City, Boston, and Chicago to illustrate the value of big data as a tool for improving government services and performance in a variety of areas); S. Rich, *Boosting Innovation by Rethinking Government Procurement*, GOVERNMENT TECHNOLOGY, Oct. 28, 2013, <http://www.govtech.com/budget-finance/Boosting-Innovation-by-Rethinking-Government-Procurement.html> (discussing innovative projects in North Carolina and Philadelphia to improve government procurement); J. Zauzmer, *Mayor Gray Celebrates DC’s Good Grades*, WASHINGTON POST, Jul. 9, 2013, https://www.washingtonpost.com/local/mayor-gray-celebrates-dcs-good-grades/2013/07/09/b830fd8c-e8d3-11e2-aa9f-c03a72e2d342_story.html [<https://perma.cc/EVS3-GZHY>] (discussing the “Grade D.C.” program, which allows municipal agencies to collect and analyze citizen feedback on the quality of social services and to make appropriate improvements); MCKINSEY, *supra* note 3.

that the work is presumptively in the public domain, as it would be for works created under similar circumstances by a federal employee. Alternatively, copyright ownership would reside in the state government under a typical work-for-hire scenario. Conflict over copyright ownership in this context would likely require case by case analysis given the ambiguity surrounding state copyright ownership claims under the 1976 Copyright Act.

Copyright ownership of works created from access to big data may also be governed by contract law, be determined by the terms of the open data policy, or by some other applicable policy adopted by the state, if any. In sum, if open-data policies do not also address copyright matters, there are numerous possible outcomes for copyright ownership depending on the context in which the work was created. First, the work could be in the public domain; second, copyright ownership in creative works produced by applications of big data may reside in private citizens who authored the work, absent any contractual agreements to the contrary; third, copyright ownership may reside in state employees who authored the work absent any state policy or employee work-for hire default rule; fourth, there could be a claim for joint-authorship by some combination of the different parties—the state, state employees, and private citizens. Of the numerous options, re-privatizing creative works produced from open-data regimes is arguably the least welfare-enhancing but also the most likely outcome for reasons I will now briefly discuss.

The history of intellectual property is firmly rooted in the government's neoclassical economic ideology and relationship with elite market actors, starting with the patronage system and continuing through the rise of free trade economics to the welfare state, to the current deregulated so-called "sharing economy."²² This Part provides an initial overview of the history of governments' early conceptualization of intellectual property as the object of state law, followed by an overview of the statutory public domain default rule for federal government works established in the 1976 Copyright Act. The Part concludes with a discussion of practices in other countries where government ownership of its works has been leveraged to enhance the public good.

22. Joanna Kulesza & Roy Balleste, *Signs and Portents in Cyberspace: The Rise of Jus Internet as a New Order in International Law*, 23 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 1311, 1336 (2013) (discussing the Internet as a hybrid economy that allows commercial success to derive from sharing economies); Jerome H. Reichman, *Intellectual Property in the Twenty-First Century: Will the Developing Countries Lead or Follow?*, 46 *HOUS. L. REV.* 1115, 1148–49 (2009) (arguing that developing countries should "participate actively" in initiatives such as the sharing economy).

A. Historical Antecedents

In 1689, John Locke famously wrote in his *Two Treatises on Government* that a man is entitled to the fruits of his own labor.²³ How this principle applies in the realm of intellectual property, where the “fruits” at issue are intangible and the “labor” has occurred largely in the mind of the creator, has engendered important scholarly debate and examination.²⁴ The question is further complicated when considering the different roles of the government in the intellectual property sphere. On the one hand, the government is tasked with ensuring both that the exclusive rights it grants to creators in fact serve the public and that works are meaningfully accessible, while on the other hand the government has long been the owner of such rights in one capacity or another and seeks as much as any other rational IP owner to maximize rent.

In sixteenth century England, it was the Crown that possessed the power “to grant printing privileges over individual texts as well as entire classes of work.”²⁵ While this exercise of royal control was motivated in part by efforts to control the press and the content of ecclesiastical publications,²⁶ it was also a method of controlling the market for certain types of works to both preserve its power and enrich rulers. In some cases, not even creators could print their own works without government permission.²⁷ Though control of printing regulations was later granted to the Stationers’ Company, creating what became known as the “stationers’ copyright,” some commentators argue that this transfer was essentially a guise for

23. John Locke, *Two Treatises of Government*, in THE WORKS OF JOHNS LOCKE 116 (1823), <http://socserv2.socsci.mcmaster.ca/econ/ugcm/3ll3/locke/government.pdf> [<http://perma.cc/3SMG-KHQG>].

24. Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533, 1535 (1993) (describing how the natural rights theory and intellectual property intersect); see also ROBERT P. MERGES ET AL., INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL ACT SURVEY 3 (6th ed. 2012). For example, Locke would likely reward a person for their labor in producing a work, and yet copyright law does not recognize the “sweat of the brow” doctrine. MERGES, *supra* note 24, at 3.

25. Ronan Deazley, *Commentary on: The Articles of the Pope’s Bulle (1518)*, PRIMARY SOURCES ON COPYRIGHT (2008), http://www.copyrighthistory.org/cam/tools/request/showRecord?id=commentary_uk_1518 [<http://perma.cc/5THL-RZ4H>].

26. *Id.*; Ronan Deazley, *Commentary on: Henrician Proclamation (1538)*, PRIMARY SOURCES ON COPYRIGHT (2008), http://www.copyrighthistory.org/cam/tools/request/showRecord?id=commentary_uk_1538 [<http://perma.cc/2SRV-R2PX>] [hereinafter *Henrician Proclamation*].

27. The Henrician Proclamation “prohibit[ed] the printing and publishing of ecclesiastical and other books without prior licence, as well as the importation, sale and publication of English language texts printed on the continent. This Proclamation established the precedent for the pre-publication licensing of literary works in England.” *Henrician Proclamation*, *supra* note 26.

continued governmental control.²⁸ And even if this is too simplistic a description of the stationers' copyright, monarchs continued to utilize the parliament and other royal tools to pass laws that attempted to retain governmental, rather than creator, control over knowledge goods.

In the Anglo-American tradition, the goal of IP regulation is explicitly couched in well-known utilitarian terms set forth in the Intellectual Property Clause of the Constitution.²⁹ The government therefore has a very specific role to play in the policy choices embedded in the design of national IP laws to serve the general public interest. Considering the government's role in promoting the general public good requires explicit acknowledgement of the conflicting interests that arise from the government's direct financial stake in the grant of exclusive rights in the cultural goods it creates or funds. Federal agencies regularly partner with educational research institutions, private industry, non-profit organizations, and other entities to engage in research collaborations that produce innovation leading to various IP grants. This is the model in most member countries of the Organisation for Economic Co-operation and Development (OECD).³⁰

In the US, state and local governments also are increasingly engaged in partnerships with private industry, granting access to big data to develop new products, goods, and services. There is no question that in many cases, the private sector is better equipped to utilize data-driven tools to address social problems and thus enhance public welfare.³¹ There can also be no question that public-private partnerships have played and continue to play a critical role in advancing scientific discovery and innovation. Even so, the well-known challenges of the political economy of IP law-making, in addition to the government's direct economic interest in the market for creative works, make the policy landscape much murkier to navigate when considering what options best promote public welfare.

It is conventional to justify copyright protection, and for that matter all IP rights, as a means to advance the public interest.³² The

28. Ronan Deazley, *Commentary on: Stationers' Charter (1557)*, PRIMARY SOURCES ON COPYRIGHT (2008), http://www.copyrighthistory.org/cam/tools/request/showRecord?id=commentary_uk_1557 [<http://perma.cc/7HEY-JVMY>].

29. U.S. CONST. art. 8, § 8, cl. 8.

30. See OECD, OECD SCIENCE, TECHNOLOGY AND INDUSTRY SCOREBOARD 2013: INNOVATION FOR GROWTH (2013) [hereinafter, SCOREBOARD 2013]. For a summary of OECD's findings of various governments' investment in this area, see *id.* at 13–15.

31. GOLDSMITH & S. CRAWFORD, *supra* note 21.

32. Nothing seems to confirm this elemental point more than the IP Clause itself. This Clause gives Congress the power “[t]o promote the Progress of Science and useful Arts, by

true end of the public welfare pillar upon which IP law purports to rest is ensuring that the populace benefits from the creative enterprise—not just in some abstract, speculative sense,³³ but in real, direct, and personal terms. Accordingly, an optimal vision of IP regulation traditionally requires equilibrium between the exclusive rights of creators and innovators and measures to ensure the public has access to protected works. Such equilibrium may be achieved by internal adjustments within IP law itself—the interminable search for “balance” that is the focus of exceptions and limitations to the mandatory set of copyright’s exclusive rights³⁴—or through a combination of internal mechanisms and external supplementary regimes such as unfair competition, consumer protection, or antitrust.³⁵ Either way, actually securing the slice of the public good effectuated through IP law requires intentional government intervention in the innovation ecosystem; a very visible hand must guide the socioeconomic and regulatory context in which the objectives of IP rules can best be realized.³⁶ Careful regulation of the ubiquitous web of technological infrastructure and IP policies that mediate the conditions of welfare in the digital economy is a challenge for governments worldwide. To begin, we must accept that the government’s role in setting IP policy is much more nuanced and, certainly in the United States, that there can be serious conflict between what is best for the public welfare and the government’s own economic interests in a system of strong IP rights.

securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” US CONST. art. 1, § 8, cl. 8.

33. Cf. The “ultimate aim” of copyright law is “to stimulate artistic creativity for the general public good.” *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 432 (1984).

34. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) mandates a minimum set of rights all WTO Member States must accord to rights holders. See *generally* Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Annex 1C, 1869 U.N.T.S. 299. One way in which the TRIPS Agreement establishes this balance is by setting these minimum standards, but then allowing Member States to enact “more extensive protection than is required” under the Agreement. *Id.* at art. 1.

35. See *Illinois Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 34 (2006) (noting that four different legal regimes have supported challenges to tying agreements: (1) the patent misuse doctrine; (2) unfair competition under §5 of the Federal Trade Commission Act, 15 U.S.C. § 45; (3) contracts tending to create a monopoly under §3 of the Clayton Act, 15 U.S.C. § 13a; (4) contracts in restraint of trade under § 1 of the Sherman Act).

36. A recent Organisation for Economic Co-Operation and Development (OECD) Report on innovation challenges governments to treat innovation “as a central tool of policy making” to ensure policy coherence across a wide spectrum of government portfolios. ORG. FOR ECON. CO-OPERATION & DEV., *THE INNOVATION IMPERATIVE: CONTRIBUTING TO PRODUCTIVITY, GROWTH AND WELL-BEING* 16 (2015). The Report notes the need for complimentary policies to deal with the disruptive effects of innovation, highlighting that “policy plays an important role in shaping the relationship between innovation and inclusive growth.” *Id.* at 21, 24.

B. The Statutory Baseline for Government Ownership of Copyright

As already noted, § 105 of the 1976 Copyright Act provides that copyright protection does not inhere in works created by the US Government.³⁷ In contrast, § 207 of the Patent Act permits federal agencies to own patents on its inventions³⁸ and there are many federal agencies such as the Department of Defense, the Environmental Protection Agency, and the Department of Commerce that produce significant numbers of patents.³⁹ The federal government also actively licenses its patents.⁴⁰ By maintaining patents, the government argues that it effectively utilizes taxpayer dollars by conducting cutting-edge research and then benefits the economy through transferring these rights.⁴¹ The government is also allowed to protect its own trademarks⁴² and a search of the trademark registry reveals hundreds of marks registered to “US Department of” owners. Moreover, the National Institute for Standards and Technology (NIST) enjoys an exception to § 105 of the Copyright Act for its Standard Reference Data.⁴³ The bottom line is that the government is an active participant in the market for creative goods in all the categories of IP.

The statutory provision that prohibits the government from securing copyright protection in its own creative works is rooted in historical precedent. Access to judicial decisions was the principal area of concern, and it was decided early on that such decisions should be available for public use.⁴⁴ As the Supreme Court stated in *Wheaton v. Peters*, “No reporter of the decisions of the supreme court [sic] has, nor can he have, any copyright in the written opinions delivered by

37. Copyright Act, 17 U.S.C. § 105 (2012).

38. Patent Act, 35 U.S.C. § 207 (2012).

39. NAT'L INST. STANDARDS & TECH., US DEP'T OF COMMERCE, FEDERAL LABORATORY TECHNOLOGY TRANSFER FISCAL YEAR 2012 5 (2014), <http://www.nist.gov/tpo/publications/upload/Federal-Laboratory-TT-Report-FY2012.pdf> [<http://perma.cc/J34F-XAUE>]. In 2014, for example, “the U.S. Government received 1024 utility patents.” US PATENT & TRADEMARK OFFICE, PATENTING BY ORGANIZATIONS (UTILITY PATENTS) 2014, A1-1 (2015).

40. *See generally* US DEP'T OF COMMERCE, ANNUAL REPORT ON TECHNOLOGY TRANSFER: APPROACH AND PLANS, FISCAL YEAR 2014 ACTIVITIES AND ACHIEVEMENTS 4–5 (2015), <http://www.nist.gov/tpo/publications/upload/DOC-FY2014-Annual-Tech-Transfer-DOC.pdf> [<http://perma.cc/LJ9A-LU4G>].

41. NAT'L INST. STANDARDS & TECH., US DEP'T OF COMMERCE, FEDERAL LABORATORY TECHNOLOGY TRANSFER FISCAL YEAR 2010 2 (2012), http://www.nist.gov/tpo/publications/upload/Fed-Lab-TT_FINAL.pdf [<http://perma.cc/KV5J-XT94>].

42. 15 U.S.C. § 1052.

43. Standard Reference Data Act, 17 U.S.C. § 290e(a) (1968) (“Notwithstanding the limitations under section 105 of title 17, the Secretary may secure copyright and renewal thereof on behalf of the United States as author or proprietor in all or any part of any standard reference data which he prepares or makes available under this chapter, and may authorize the reproduction and publication thereof by others.”).

44. *Wheaton v. Peters*, 33 U.S. 591, 593 (1831).

the court”⁴⁵ Another nineteenth century opinion, *Nash v. Lathrop*, came to a similar conclusion that “[t]he decisions and opinions of the justices . . . are binding upon all the citizens. . . . Every citizen is presumed to know the law thus declared”⁴⁶ Like statutes, therefore, judicial opinions should be available to all.⁴⁷

Early copyright acts did not explicitly include a prohibition on owning judicial opinions. Instead, the prohibition was a matter of public policy largely articulated and enforced by the courts. This policy was eventually codified in the Printing Act of 1895, which stated that “no other government publication shall be copyrighted.”⁴⁸ Subsequently, it took fourteen years for the prohibition on copyright in federal government works to appear explicitly in a copyright statute in §8 of the 1909 Copyright Act.⁴⁹

Despite the simplicity of § 8 of the 1909 Copyright Act, there was some uncertainty about this provision.⁵⁰ Section 8 stipulated that “no copyright shall subsist . . . in any publication of the United States Government.”⁵¹ It was unclear, given the definitions—or lack thereof—within the 1909 statute, whether this prohibition applied to unpublished government works, those prepared only by government employees or by private individuals on behalf of the government, or whether the prohibition only applied to printed materials.⁵²

The 1976 Copyright Act cleared up some of the uncertainty. The legislative history of § 105 maintains that: “The basic premise . . . is the same as that of section 8 of the present law [Section 8 of former Title 17]—that works produced for the U.S. Government by its officers and employees should not be subject to copyright.”⁵³ At the time the 1976 Act was adopted, some federal agencies argued for exceptions for certain materials they produced. For example, the Department of Commerce urged Congress to allow them to copyright a “limited number of publications”⁵⁴ from the National Technical Information Service (NTIS), and the National Aeronautics and Space Administration (NASA) also argued in favor of an exception for

45. *Id.*

46. *Nash v. Lathrop*, 142 Mass. 29, 35 (1886).

47. *Id.*

48. The Printing Act, ch. 23, § 52, 28 Stat. 601, 608 (1895).

49. The Copyright Act of 1909, ch. 320, § 7, 35 Stat. 1075, 1077 (1909).

50. John O. Tresansky, *Impact of the Copyright Act of 1909 on the Government*, 35 FED. B.J. 22, 23 (1978).

51. *Id.*

52. The latter uncertainties were resolved by a 1964 Bureau of the Budget memorandum, clarifying that a government publication was limited to those works that were prepared by a government employee through their official duties. *Id.*

53. H.R. REP. NO. 94-1476, at 59 (1976).

54. 122 CONG. REC. 34225 (1976).

“exceptional circumstances.”⁵⁵ In terms of the “exceptional circumstances” exception, such a provision had already been considered and was dropped in response to opposition in 1965.⁵⁶

In conjunction with other provisions in the 1976 Act, the restatement of the legal position on copyright in government works actually clarified many of the outstanding concerns. Section 101, in particular, explicitly defines what counts as a government work,⁵⁷ and the legislative history of § 105 makes clear that the provision is meant to apply to unpublished as well as published works.⁵⁸ With respect to government-commissioned works, case law explores the point that withholding protection from government works benefits the public interest.⁵⁹ Thus, the government could potentially withhold copyright protection for commissioned works in pursuit of this interest⁶⁰ consistently with the malleability of § 105. Congress definitely viewed the degree of access enabled by a lack of copyright as a substantial benefit to the public.

Several arguments in favor of the presumptive public domain status of federal government works center on the rationale that such works are funded at public expense and so should be freely accessible by the public.⁶¹ Additionally, some commentators argue that in a democratic society, government-created works should be disseminated freely.⁶² These arguments are maddeningly problematic, even if correct in principle. Most OECD governments, including the United States, fund a significant portion of the creative enterprise.⁶³ Basic R&D funding galvanizes the applied research that is eventually captured by the patent system, just as books, movies, software, and music are the direct or indirect derivatives of basic investment in education, literacy, and the arts.⁶⁴ IP laws thus tend to be a second-

55. *Copyright Law Revision: Hearing Before the Subcomm. on Courts, Civil Liberties, and the Admin. of Justice of the H. Comm. on the Judiciary*, 94th Cong. 1787–88 (1976).

56. *Id.*

57. 17 U.S.C. § 101 (2012).

58. H.R. REP. NO. 94-1476, at 59.

59. *Schnapper v. Foley*, 667 F.2d 102, 108–09 (D.C. Cir. 1981).

60. *See id.* at 108.

61. Marvin J. Nodiff, *Copyrightability of Works of the Federal and State Governments Under the 1976 Act*, 29 ST. LOUIS U. L.J. 91, 93 (1984).

62. *Id.*

63. Examining the portion of gross domestic product (GDP) that countries put into R&D demonstrates that significant resources are invested in this type of development. *Research and Development Statistics (RDS)*, OECD, <http://www.oecd.org/innovation/innolresearchanddevelopmentstatisticsrds.htm> [<http://perma.cc/SM58-N6F8>].

64. To see how much each country puts into these areas, see *Gross Domestic Expenditure on R-D by Sector of Performance and Socio-Economic Objective*, OECD, http://stats.oecd.org/Index.aspx?DataSetCode=BERD_INDUSTRIY [<http://perma.cc/2P9Q-AUK6>]. For example, while the United States is the leader in R&D expenditures, with \$415 billion of

level tax⁶⁵ on the public that, having already funded the necessary elements of the creative society, must also pay in order to enjoy its bounty of knowledge goods and innovation.

To be clear, this is not to say that access to knowledge goods or innovation ought to be without some cost to specific users—only that the cost to the public goes beyond the monopoly gains exclusive rights make possible. Other costs may include diminished access to educational resources, burdens on free speech, and limited competition in certain industries such as software. In short, the cost of the copyright system, though difficult to validate empirically, can be significant in terms of its broader socio-economic implications. When the production of knowledge goods is largely made possible by direct government subsidies there should be no right to exclude public access to those goods as is possible under the current system or to charge the full monopoly price that the IP privilege allows. Access to such goods should be made available at lower cost; there simply is no good argument for why rights owners are subsidized and the public is twice taxed.

Limited forms of “rebates” to the public from government-funded research have begun to emerge in recent history. One key example is the recent National Institutes of Health (NIH) policy that requires grantees to make copies of journal articles produced from government research grants accessible in public repositories.⁶⁶ In the last decade, increasing numbers of higher education institutions have adopted policies requiring faculty members to make copies of their work available to the public in university-funded repositories.⁶⁷ These various efforts reflect parallel

such expenditures in 2011, it is followed by China, Japan, Germany, and Korea. SCOREBOARD 2013, *supra* note 30, at 50. China provides an example of an emerging economy with significant investment in research. *Id.* at 14.

65. Thomas Babington Macaulay’s speech to the House of Commons in 1841 famously noted that the institution of copyright is a first-level tax on the public. “The principle of copyright is this. It is a tax on readers for the purpose of giving a bounty to writers.” THOMAS BABINGTON MACAULAY, *Speeches to House of Commons on 5 Feb. 1842 Opposing Proposed Life & 60 Year Copyright Term and on 6 April 1842 Favoring a 42-year Fixed Term Over a Life & 25 Year Term*, in PROSE AND POETRY (G.M. Young ed. 1967), <http://homepages.law.asu.edu/~dkarjala/OpposingCopyrightExtension/commentary/MacaulaySpeeches.html> [<http://perma.cc/SU9K-8ZNN>].

66. Any manuscript that is peer-reviewed, accepted for publication on or after April 7, 2008, and arises from NIH funding in some capacity is subject to this policy. Omnibus Appropriations Act, Pub. L. No. 111-8, Div. F, § 217 (2009); US DEP’T OF HEALTH & HUMAN SERV., *NIH Public Access Policy Details*, NAT’L INSTS. OF HEALTH, <https://publicaccess.nih.gov/policy.htm> [<https://perma.cc/JUD2-3QQZ>].

67. For example, in a policy adopted in 2014 by the Board of Regents, faculty at the University of Minnesota grant the University “a shared, limited, right to make available his or her *scholarly articles* and to reproduce, display, and distribute those articles for the purpose of

developments in scientific and research communities whereby governments in several countries are mandating open-access research communities to facilitate global research efforts addressing significant issues of our time.⁶⁸

In short, IP rights may be a vehicle, among others, to incentivize investment in the creative enterprise, but the design of those rights should reflect the public's prior investment. An important justification for "balanced" IP regimes is not only that exclusive rights may incentivize private investment in research and creative activity, but the public's investment also deserves a return beyond just the promise of new goods and services in the marketplace. Otherwise, IP laws may truly become just another means of redistributing income from those who have little to those with more resources.⁶⁹

C. Access Despite Ownership

In contrast to the United States, the United Kingdom and Australia have very different rules on government ownership of copyright. In the United Kingdom, the concept of "Crown copyright" exists for government works.⁷⁰ It applies to "work[s] made by Her Majesty or by an officer or servant of the Crown in the course of his duties."⁷¹ Under UK law, Crown copyright in unpublished works lasts for 125 years, or, if the work is published fifty years from

open access." *Administrative Policy: Open Access to Scholarly Articles*, UNIV. OF MINN, <https://policy.umn.edu/research/scholarlyarticles> [<https://perma.cc/9ADM-ZX93>].

68. Jerome H. Reichman, *The Limits of Limitations and Exceptions*, in COPYRIGHT LAW IN AN AGE OF LIMITATIONS AND EXCEPTIONS (Ruth L. Okediji ed., forthcoming CUP 2016) (describing initiatives in the United States and the United Kingdom that mandate the pooling of government-funded research results in the human genome project). Professor Reichman also notes that "the scientific community has experimented with an ever growing number of both mandatory and voluntary data-pooling initiatives that result either in semicommons frameworks open to qualified participants working on related problems or in fully open-access research commons, in which data and information are made available to the world at large." *Id.*

69. Certain cases evidence the fact that in some instances, copyright law is particularly deferential to the judgment of the elite class. See *Cariou v. Prince*, 714 F.3d 694, 709 (2d Cir. 2013) (characterizing misappropriation as redistribution in describing how the secondary work was being sold for millions of dollars, while the original work was barely profitable); *Kieselstein-Cord v. Accessories by Pearl, Inc.*, 632 F.2d 989, 993-94 (2d Cir. 1980) (finding that high-end belt buckles could be copyrighted because they have artistic elements that are separate from the useful articles themselves).

70. *Fact Sheet P-01: UK Copyright Law*, UK COPYRIGHT SERVICE, https://www.copyrightservice.co.uk/copyright/p01_uk_copyright_law [<https://perma.cc/RN5Z-XGAX>]. This concept of Crown copyright applies in all Commonwealth countries. *Copyright*, CAN. ASS'N OF RESEARCH LIBRARIES, <http://www.carl-abrc.ca/en/public-policy/Copyright/crown-copyright.html> [<http://perma.cc/MJ9K-72XA>].

71. Copyright, Designs and Patents Act 1988, c. X, § 163, (UK).

publication.⁷² Australia has a similar rule and has issued guidance to their government agencies about how to best manage their IP interests.⁷³

Interestingly, countries that provide for seemingly stronger IP rights in government works usually establish mechanisms that facilitate access to those works. For example, the National Archives in the United Kingdom is in charge of managing Crown copyright, a duty that includes licensing such materials through a comprehensive governmental licensing scheme.⁷⁴ The National Archives also delegates authority to agencies and departments within the government, in order for such departments to facilitate their own licensing,⁷⁵ typically for no more than a nominal fee if at all.

Nordic countries provide another useful example of a legislatively crafted licensing scheme for government-owned creative works. For example, Denmark's Copyright Act does not contain a provision excluding all government works from copyright protection, although acts and official documents are not protected.⁷⁶ Instead, the Act provides access in the form of Extended Collective Licenses (ECLs).⁷⁷ ECLs, which are also utilized in Finland, Iceland, Norway, and Sweden, are a mass licensing system agreed to by a large group of rights holders that facilitate access to protected works.⁷⁸ Copyright law in Denmark (and other Nordic countries) does not specify the content of these agreements but does extend their application to rights holders not represented during the formation of the agreement.⁷⁹ These legislatively mandated schemes to promote access to government works illustrate the point that the entities that control ownership of cultural goods also control access to them, and that ownership can be used to facilitate access to knowledge goods, not just to maximize rent. Ownership can be at least as effective, or even a better, means of ensuring access to creative works and advancing innovation.

72. *Fact Sheet*, *supra* note 70.

73. ATT'Y-GEN.'S DEPT, THE AUSTRALIAN GOVERNMENT INTELLECTUAL PROPERTY RULES 1, [https://www.ag.gov.au/RightsAndProtections/IntellectualProperty/Documents/Quickguide to the Aus Gov IP Rules.pdf](https://www.ag.gov.au/RightsAndProtections/IntellectualProperty/Documents/Quickguide%20to%20theAusGovIPRules.pdf) [<https://perma.cc/3XFF-D5JJ>].

74. *See infra* Part III.

75. *Crown Copyright*, NAT'L ARCHIVES (UK), <http://www.nationalarchives.gov.uk/information-management/re-using-public-sector-information/copyright-and-re-use/crown-copyright/> [<http://perma.cc/C4WM-ZVC8>].

76. Consolidated Act on Copyright 2010 (Act No. 202) (Den.), § 9.

77. Thomas Riis & Jens Schovsbo, *Extended Collective Licenses and the Nordic Experience—It's a Hybrid but is it a Volvo or a Lemon?*, 33 COLUM. J.L. & ARTS 471, 472 (2010).

78. *Id.* at 474.

79. *Id.* at 476.

At first blush, a government's baseline rule about its copyright ownership in its works could reflect particular normative ideas about public welfare and the relationship between access to knowledge goods and socioeconomic development.⁸⁰ Indeed, the particular baseline rule selected by a country may illustrate the government's ultimate sense of obligation to ensure that all citizens have the opportunity to enjoy the benefits of the good life. In the digital environment, government ideologies about copyright and public welfare will be repeatedly tested in light of new mechanisms that make access to vast amounts of data and creativity possible. Analyzing emerging models of government regulation of big data will help underscore the important and different roles the government can play not only as owner of vast amounts of data that fuels innovation, but also as steward of the public interest. The rules employed in the regulation of big data could become one of the most important measures of public welfare in the digital information age.

III. EMERGING PROSPECTS FOR ENHANCING WELFARE IN A DATA-DRIVEN DIGITAL ECONOMY

The implications of differing approaches to government ownership are reflected in business models that have emerged to respond to the way in which governments deal with intellectual property. Open-access models and Creative Commons (CC) licenses are two examples of ways in which the government has influenced both public and private actors to make the intellectual property arena a more accessible environment. This Part reviews current practices in the UK and Australia, two common law countries where the statutory rule regarding government works vests copyright ownership in the government.

A. Government Licensing and Crown Copyright in the United Kingdom

As mentioned previously, the United Kingdom does not prohibit government ownership of copyrights in the same way that the United States does. Perhaps in response to the more limited availability of government works, the United Kingdom has developed

80. Because intellectual property is continually creating a "larger share of economic value, policy makers will be confronted with a growing need to balance the benefits of gaining control over [intellectual assets] against the benefits of mobility and open access." OECD, INTELLECTUAL ASSETS AND VALUE CREATION: SYNTHESIS REPORT 30 (2008).

a licensing framework for “public sector information.”⁸¹ The UK Government Licensing Framework (UKGLF) allows more open access to government works⁸² through “[t]he removal of barriers to re-use, by introducing simple and transparent licensing processes”⁸³ The UKGLF is limited to copyright and database rights⁸⁴ and is not available for rights that the government acquired, rather than created.⁸⁵ But when the licensing scheme is applicable, it can manifest in different ways.

First, there is the Open Government License (OGL), which allows “re-use for all purposes, both commercial and non-commercial.”⁸⁶ Under the OGL, information can be used for any purpose so long as an attribution statement is included.⁸⁷ Second, the Non-Commercial Government License applies in more restricted circumstances.⁸⁸ Information made available under this license can only be reused for a noncommercial purpose, again with an attribution statement.⁸⁹ Finally, the Charged License is available when charges are levied for the re-use of information.⁹⁰ Within this scheme, any charges levied “must be limited to the marginal costs incurred in respect of the reproduction, provision, and dissemination of documents.”⁹¹ Regulations dictate the guidelines for these charges and stress that they should not exceed direct costs, surpass cost of overhead, or diminish a reasonable return on investment for producing the document.⁹² Other legislative directives, such as freedom of information statutes, may intersect with these licenses in that information that “is not accessible under information access legislation . . . falls outside the scope” of these government licenses.⁹³ Additionally, some information acquired through the use of

81. NAT'L ARCHIVES, UK GOVERNMENT LICENSING FRAMEWORK FOR PUBLIC SECTOR INFORMATION 4 (4.1 ed. 2014), <http://www.nationalarchives.gov.uk/documents/information-management/uk-government-licensing-framework.pdf> [<http://perma.cc/AN79-RR7W>] [hereinafter NAT'L ARCHIVES 1].

82. *Id.*

83. *Id.* at 5.

84. *Id.* at 6. Database rights protect the effort involved in the creation of a database, and they last for fifteen years from the date on which the database was open to the public. UK OFFICE OF LIBRARY & INFO. NETWORKING, AN INTRODUCTION TO DATABASE RIGHTS (2009).

85. NAT'L ARCHIVES 1, *supra* note 81, at 9.

86. *Id.* at 13.

87. *Id.*

88. *Id.* at 14.

89. *Id.*

90. *Id.* at 15.

91. The Re-Use of Public Sector Information Regulations 2015, § 15 tbl. 2.42 (UK).

92. *Id.*

93. NAT'L ARCHIVES 1, *supra* note 81, at 7.

information acts may be subject to copyright and require permission to use.⁹⁴

Guidelines promulgated by the National Archives for the United Kingdom underscore that “[t]he Open Government [License] should be the default [license] where public sector information is made available for re-use free of charge.”⁹⁵ These Guidelines urge governmental departments to make information available free of charge in order to maximize “the social and economic value of the information.”⁹⁶ The OGL has been embraced by many government departments at various levels, including Ministerial departments, executive agencies, and local councils.⁹⁷ This preference suggests that the UK government may negatively view restrictions on use that are inserted in the Non-Commercial Government License.

In contrast, an agency or department using an OGL must provide an attribution statement and notice that the underlying IP is being made available pursuant to the license.⁹⁸ And while charging for use is allowed, it is subject to many additional rules and regulations. First, the charge should be assessed to only cover marginal costs, and departure from this calculation must be justified against specific criteria.⁹⁹ These criteria include the context in which the information is situated, the cost of producing it, its availability elsewhere, the conditions of the market, and other considerations.¹⁰⁰ In effect, the policy taxes any effort to deviate from free use of the work, which is a clear reversal of the author- or owner-centric paradigm that pervades contemporary copyright law.

What the licensing system in the United Kingdom suggests is that even when government (or other) works *can* obtain some level of protection under traditional copyright law, the public interest may be better served by nevertheless making the information freely available

94. *Id.* at 5, 8.

95. *Id.* at 12.

96. *Id.*

97. For example, the copyright statement for the Ministry of Defense explains that certain images on its site are available through the Open Government License. *MOD Copyright Statement*, MINISTRY OF DEF. (UK), <http://www.defenceimagery.mod.uk/fotoweb/Copyright.fwx> [<http://perma.cc/94F3-CG4T>]; see also *Open Data*, WYRE COUNCIL (UK), <http://www.wyre.gov.uk/opendata> [<http://perma.cc/JH8Q-Y2HP>] (explaining that the information on the site is available under the Open Government License and providing an attribution statement); *Terms and Conditions*, HIGHWAYS ENGLAND, <http://www.highways.gov.uk/terms-and-conditions/> [<http://perma.cc/JF48-ZLB2>] (stating that all the information on the website, excluding logos, is available under the Open Government License).

98. NAT'L ARCHIVES 1, *supra* note 81, at 13.

99. *Id.* at 12.

100. NAT'L ARCHIVES (UK), CRITERIA FOR EXCEPTIONS TO MARGINAL COST PRICING (2009), <http://www.nationalarchives.gov.uk/documents/information-management/criteria-exceptions-marginal-cost-pricing.pdf> [<http://perma.cc/AZJ9-KX79>].

to the public, even with certain conditions attached. Admittedly, the UK licensing model attaches more restrictions to the use of government works than may be ideal, where none ostensibly would be needed in the United States, since the lack of copyright protection precludes any restrictions *ab initio*.¹⁰¹ In reality, however, the amount of works that fall under the proscription in § 105 may be quite limited compared to what the government actually owns. This is due to the manipulation of the legislative language that allows the government to be the assignee of IP rights it did not create and to be a royalty-free licensee of other works created by sub-contractors or other agents.¹⁰² That being said, the UK licensing scheme underscores the unique position the government holds with respect to its intellectual property. Even when granted similar rights as private authors, the role of the government in protecting the public interest should temper this protection and encourage access to—and use of—such works with the least possible transaction costs levied on the public. Indeed, taxing efforts to burden access to such works is a strong signal regarding the value the government places on access to protected works in the digital economy.

Such an open-access, limited transaction cost regime does not have to be mandated by the government, however. Creative Commons licenses offer a similar scheme with a similar purpose, which is private in nature.¹⁰³ These default licenses—essentially terms of use—permit copyright owners to craft individualized licenses reflecting the terms and conditions of access or use by the public.¹⁰⁴ While imperfect solutions to the general problem of imbalanced copyright laws,¹⁰⁵ CC licenses do mediate between users and owners in

101. In reality, however, it may be that the UK licensing model actually facilitates more access to works that the government owns because there is no analogous access regime for the number of works in which the government does own a copyright.

102. 17 U.S.C. § 105 (2015); CENDI, *supra* note 17, at 4.9 (“The Federal awarding agency reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use the work for federal purposes, and to authorize others to do so.”). So, in fact, the government may own valuable intellectual property rights through this legislative loophole, where copyrights are either transferred to it or it is allowed to use protected works without paying a royalty. In terms of all IP rights, estimates for 2010 show that the government earned roughly \$250 million in licensing and royalty fees. NAT’L INST. STANDARDS & TECH., US DEPT’ OF COMMERCE, FEDERAL LABORATORY TECHNOLOGY TRANSFER FISCAL YEAR 2010 21 (2012), http://www.nist.gov/tpo/publications/upload/Fed-Lab-TT_FINAL.pdf [<http://perma.cc/KV5J-XT94>].

103. Interestingly, the UK licensing scheme is explicitly described as being “compatible with the Creative Commons Attribution license.” NAT’L ARCHIVES 1, *supra* note 81, at 10.

104. *History*, CREATIVE COMMONS, <https://creativecommons.org/about/history> [<https://perma.cc/SYB6-AXSH>].

105. See Niva Elkin-Koren, *What Contracts Cannot Do: The Limits of Private Ordering in Facilitating a Creative Commons*, 74 FORDHAM L. REV. 375, 378 (2005) (expressing skepticism about the legal strategy of Creative Commons).

a way that facilitates most noncommercial uses of copyrighted content. CC does not track the number of licenses being used,¹⁰⁶ but governments, such as that of Australia, are utilizing the benefits of CC licenses.¹⁰⁷

B. Creative Commons Licenses and Crown Copyright in Australia

Australia provides an interesting intersection between the UK licensing model and the Creative Commons approach. In Australia, access to government works has been the subject of an ongoing discussion, with the Commonwealth Government continually producing reports that encourage open access to public sector information.¹⁰⁸ A Copyright Law Review Committee was formed to consider reforms to Crown copyright, and it made a series of recommendations that would have limited Crown copyright in certain circumstances.¹⁰⁹ Yet no legislative response was actually achieved.¹¹⁰ Instead, the Australian government relies on Creative Commons licensing.¹¹¹ For example, Australian agencies such as the Australian Bureau of Statistics “are licensing much of their output using Creative Commons licences”¹¹²

Some commentators argue that the Australian government’s reliance on CC licenses means that efforts to preclude copyright protection for works of the Australian government will be less successful.¹¹³ The policy of the Australian Commonwealth Government is to “openly licence [public sector information] and the Creative Commons standard is being used as the default.”¹¹⁴ Of the myriad licensing options that CC offers, the default for the Australian government appears to be the Attribution License.¹¹⁵ This license is

106. *Frequently Asked Questions*, CREATIVE COMMONS, https://wiki.creativecommons.org/wiki/Frequently_Asked_Questions#Does_Creative_Commons_collect_or_track_materials_license_d_under_a_CC_license.3F [<https://perma.cc/QE8F-CUJ7>].

107. Judith Bannister, *Open Government: From Crown Copyright to the Creative Commons and Culture Change*, 34 U. NEW S. WALES L.J. 1080, 1091–96 (2011), http://www.unswlawjournal.unsw.edu.au/sites/default/files/46_banniester.pdf [<http://perma.cc/MH9G-VXGT>].

108. *Id.* at 1091.

109. *Id.* at 1095.

110. *Id.* at 1096.

111. *Id.*

112. AUSTRALIAN MINISTRY OF FIN., REPORT OF THE GOVERNMENT 2.0, xiv–xii (2009), <http://www.finance.gov.au/publications/gov20taskforcereport/doc/Government20TaskforceReport.pdf> [<http://perma.cc/4524-W44Y>].

113. Bannister, *supra* note 107, at 1096–97.

114. *Id.* at 1099.

115. *Id.*

similar to the OGL in the United Kingdom in that all that is required is attribution—no other limitations are imposed.¹¹⁶ The United Kingdom explicitly conforms to the “Open Definition,” a definition created by the international non-profit Open Knowledge.¹¹⁷ Open Definition strives to maximize interoperability and sets standards for the creation of “open works.”¹¹⁸ In essence, “Open Definition” is an access standard that ensures compatibility between different collections of open materials so that people can move seamlessly between data without technical or legal barriers. This illustrates how open-access licensing regimes can be complementary, drawing on other resources like CC or the Open Definition to continue to optimize access and diffusion of knowledge.

Australia’s adoption of the CC license may seem to put its access model on equal footing with the United Kingdom, however the Guidelines produced by the Attorney General’s Department make clear that such licensing schemes are only applied to works on a case-by-case basis.¹¹⁹ Due diligence is required to determine whether such a license is an appropriate course of action.¹²⁰ Some of the criteria listed for making this determination include whether the Commonwealth has an interest in maintaining control over the work and whether third-party copyright on parts of the material exists, among others.¹²¹

C. To Own or Not to Own: Does the Statutory Default Rule Matter?

Many other countries, particularly members of the British Commonwealth or former British colonies in Africa, Asia and the Caribbean also have a system of Crown copyright. As developing countries, very few have actively pursued open data policies and even fewer recognize exceptions to Crown copyright. Government ownership of copyright that merely erects barriers to access and use by innovators, creators, and members of the general public constitutes a deadweight loss on the innovation infrastructure such as it exists in those countries. These ‘closed copyright’ models appear to harken back to the earliest use of copyright law to censor, control, or otherwise limit access and dissemination of government-generated

116. *Id.* at 1099; NAT’L ARCHIVES 1, *supra* note 81, at 10.

117. *About*, OPEN KNOWLEDGE, <https://okfn.org/about/> [<https://perma.cc/8E57-JSMG>].

118. OPEN DEFINITION, <http://opendefinition.org/od/> [<http://perma.cc/T6KU-MHGN>].

119. Bannister, *supra* note 107, at 1100.

120. *Id.*

121. *Id.*

information. In many cases, they are simply holdovers from colonial legislation and do not reflect any meaningful policy choices by incumbent governments. In either case, government ownership of copyright in its works as an end in itself cannot justifiably remain the status quo. Developing countries, too, must begin to consider how massive data sets can advance innovation and promote eco-systems of creative new applications, goods, and services to improve human welfare. Indeed, government ownership of its own works is one of the few areas in which recent harmonization of international copyright rules under the TRIPS Agreement has not eroded any government flexibility. All countries can take full advantage of this policy space to design flexible default rules that maximize the public's investment in the data assets that fuel innovation today and that hold significant promise for the future.

A government's default rule matters a great deal in an environment in which the capacity to create policies for inclusive growth forces consideration of the circumstances in which government ownership may enable better bargains with downstream creators that benefit the public. Setting a one-size-fits-all rule seems ill-advised; a rule that facilitates flexibility and permits benefit-sharing between creators and the public would be optimal. The models of both the United Kingdom and Australia demonstrate that there is strong interest in allowing access to government works, even if copyright protection subsists in such works. The model of copyright ownership plus default CC or other common-use license allows flexibility for governments to exercise a residual right to adapt licenses to specific circumstances, rewarding the innovator/creator at greater or lesser rates depending the nature of the knowledge asset involved. In a US-like model, the government ostensibly has no need for such licenses because its works are already in the public domain. However, as noted earlier, the number of government works subject to copyright is not insignificant, suggesting that the US public could benefit from a copyright policy that clearly adopts access as a default rule, and to leverage that rule to facilitate greater public benefit from downstream data driven knowledge assets.

IV. INTELLECTUAL PROPERTY-RELATED CONSIDERATIONS FOR A DIGITAL WELFARE STATE

A. Models for Regulating Access to Government Data and Downstream Creativity

The various regulatory schemes described above suggest an emerging multi-national view that government works should be openly accessible, even if such access is facilitated through a governmentally mandated regulatory scheme. The US model, which denies protection for government works,¹²² presumptively serves as a good starting point for an optimal access regime; but in reality, the various exceptions that exist give the government much more proprietary control over content, data, and creative works than might otherwise be suggested by the statutory prohibition. This control opens up room for creatively addressing the terms of access to knowledge goods created from big data.

At least three approaches are possible: (1) adopt an open-data policy—preferably one with clear objectives and purposes—with no conditions imposed on the public’s access to downstream creative works (pure open-data model); (2) condition use of data by innovators on conditions that optimize access to downstream knowledge goods by citizens (conditioned open-data model); (3) maintain government ownership of data but make the data as well as any downstream creative works freely available (proprietary model). Adoption of one of these models as the default baseline for access to and use of a particular set of government data does not preclude adoption of another model for data possessing different characteristics. Indeed, determining the conditions of access and use of government data should *not* be subject to a one-size-fits-all approach, but should be made with due regard to the properties of the data set involved as well as the relevant public interest(s) at stake.

1. Pure Open-Data Model

As noted earlier, the current approach employed by the US federal government allows for the free dissemination of its data, yet defers to market mechanisms to determine ownership, access, and use of any downstream applications. Apart from policies that restrict access to data altogether, this approach seems to be the least resourceful in terms of enhancing the aggregate gains to the public from open diffusion of data. Allowing private actors to freely access

122. 17 U.S.C. § 105 (2012).

and use government-owned data to create privately-owned works may be unobjectionable in principle, but it is also sub-optimal if this is the model employed for all data regardless of the potential impact on the supply of public goods. Health care-related data, for example, should be used to benefit public health at minimum cost to the government and to the public. Educational data should be similarly treated.

In a pure open-access model, barriers imposed on the public's access to government data as well as to any downstream creative works are removed. Implementation of such a model comprises two essential components: (1) mandating government agencies to release data in a way that enables its downstream processing and usage, subject to review of the data for privacy, confidentiality, security, and other lawful restrictions to release; and (2) requiring owners of the rights in downstream creative works to disseminate their works free of charge through open licenses.

As regards the first component (mandatory data release by government), the pure open-data model is consistent with an approach adopted by the Obama administration in its Executive Order of May 9, 2013, entitled *Making Open and Machine Readable the New Default for Government Information*.¹²³ To achieve its stated goal of "making information resources easy to find, accessible, and usable"¹²⁴ by the public, a Memorandum¹²⁵ issued by the Executive Office of the President pursuant to this Executive Order mandates federal government agencies to implement a number of essential tasks. These include: (1) collect or create data in a way that supports downstream processing and dissemination activities;¹²⁶ (2) build information systems to support interoperability and data accessibility;¹²⁷ (3) implement effective data asset portfolio management ensuring that

123. Exec. Order No. 13, 642, 78 Fed. Reg. 28,111 (May 14, 2013). See also, Executive Office of the President, Office of Science and Technology Policy (OSTP), Increasing Access to the Results of Federally Funded Scientific Research, Memorandum for the Heads of Executive Departments and Agencies (Feb 22, 2013), available at https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf (last visited Jan. 10, 2016).

124. *Id.*, § 1.

125. OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES (May 9, 2013).

126. *Id.*, Attachment, III.1. Specifically, the Memorandum requires executive agencies to: (1) use machine-readable and open formats; (2) use data standards; (3) ensure information stewardship through the use of open licenses; and (4) use common core and extensible metadata. *Id.*

127. *Id.*, Attachment, III.2. To achieve this goal, the Memorandum requires, in particular, that "system design must be scalable, flexible, and facilitate extraction of data in multiple formats and for a range of uses as internal and external needs change, including potential uses not accounted for in the original design." *Id.*

data are appropriately maintained throughout their life cycle;¹²⁸ (4) ensure that privacy and confidentiality are fully protected and that data are secure;¹²⁹ and (5) incorporate new interoperability and openness requirements into core agency processes.¹³⁰

As regards the second component (mandatory dissemination of downstream creative works via open licenses), the pure open-data model does not rule out IP protection of downstream knowledge goods created using government data. Like the copyright default baseline, this position defers to market mechanisms to determine ownership, recognizing that denial of IP protection for downstream works may impede investment in innovative activities. Further, such denial would result in suboptimal diffusion of knowledge goods due to the likely deployment of technological protection measures and contractual restrictions by creators. Instead, the pure open-data model, while not denying IP protection of downstream creativity, prevents the deployment of access-restrictive mechanisms, including the unilateral exercise of rights to impair public enjoyment of new goods and services.

2. Conditioned Open-Data Model

In a conditioned open-data model, release of data by the government is made contingent on ensuring that an adequate return accrues to the public for use of the data. This approach mimics the rationale of the Shelby Amendment adopted in 1999 by the US Congress,¹³¹ which mandated that the Office of Management and Budget require federal agencies to ensure that “all data produced under [a federally-funded] award [is] made available to the public through the procedures established under the Freedom of Information Act [FOIA].”¹³² A real-world template for a conditioned open-data model is the public-access policy utilized by the NIH. Under this policy, frequently utilized by universities and other research

128. *Id.*, Attachment, III.3. The Memorandum calls on government agencies to: (1) create and maintain an enterprise data inventory; (2) create and maintain a public data listing; (3) create a process to engage with customers to help facilitate and prioritize data release; and (4) clarify roles and responsibilities for promoting efficient and effective data release practice. *Id.*

129. *Id.*, Attachment, III.4.

130. *Id.*, Attachment, III.5.

131. Omnibus Consolidated & Emergency Supplemental Appropriations Act of 1999, Pub. L. No. 105-277, 112 Stat. 2681-495 (Oct. 21, 1998) (commonly referred to as the Shelby Amendment).

132. ERIC A. FISCHER, PUBLIC ACCESS TO DATA FROM FEDERALLY FUNDED RESEARCH: PROVISIONS IN OMB CIRCULAR A-110 (2013), <https://www.fas.org/sgp/crs/secretary/R42983.pdf> [<https://perma.cc/9WH6-64GE>]. The Amendment still allows protection of data that includes personal and confidential information. *Id.*

institutions, scientists are obligated to submit final peer-reviewed journal manuscripts that arise from NIH funding to a freely accessible full-text archive (PubMed Central) immediately upon acceptance of the manuscripts for publication. This scheme thus ensures a return to the public in the form of open access to the outcomes of NIH-sponsored research, while not negating IP ownership interests of downstream creators.

Additional salient examples of attempts to widen the scope of open-access materials are the so-called Open Educational Resources (OERs).¹³³ OERs are useful tools for “marginalized learners” to have the ability to access these materials and actively utilize them.¹³⁴ Several organizations have recently petitioned the US federal government to follow the NIH and “ensure that educational materials created with federal funds are openly licensed and released to the public as OER.”¹³⁵

3. Proprietary Model

In a proprietary model, the government retains ownership of its data and works and chooses to disseminate them in accordance with a prescribed policy to advance the public interest. Such dissemination can be made conditional or unconditional, depending on the type of data or interest involved, and can be made applicable both to works that have been created by the government as well as to acquired works. Use of a CC license in conjunction with government ownership of copyright is one example of an enlightened option for governments. A one-size default rule could certainly serve as a rational baseline for big data policies linked to the production of copyrightable works. Governments, however, should be willing to consider tailor-made policies for specific categories of data, particularly with regard to data applicable to innovation directed at supplying public goods. The government could leverage its ownership stake, to ensure that optimal bargains are struck between accessors of data and the cost to the public of the knowledge goods ultimately created. Examples of a viable proprietary model include the UK Government Licensing Framework, which categorizes government works and attaches varied licensing conditions on their access and

133. *Open Educational Resources (OERs)*, JOINT INFO. SYS. COMMITTEE (UK), <https://jisc.ac.uk/full-guide/open-educational-resources> [<https://perma.cc/W63E-AENT>].

134. *Id.*

135. See Cable Green, *U.S. Secretary of Education Highlights Schools Using OER to #GoOpen*, CREATIVE COMMONS, (Sept. 15, 2015), <http://creativecommons.org/weblog/entry/45984> [<http://perma.cc/59TT-PFGK>].

use, and the approach adopted by Australia, which relies on CC licenses subject to careful consideration of competing stakes.¹³⁶

B. Considerations on the Way Forward

The need to consider the characteristics of the welfare state in the digital era offers an opportunity for reconsideration of the government's role as producer and owner of information and knowledge assets. The baseline rules, and any associated exceptions, must be assessed critically when devising appropriate policies for the management and use of the government's largest asset—data. Important new data-driven initiatives at the federal, state, and local levels are emerging,¹³⁷ and the copyright status of the data or final product are becoming far less salient in deliberations about digital governance. This trend is promising but must be sustained by an affirmative rule that facilitates access to data, use of government funded works, and an open-access default rule that enhances the value of the content created and owned by the government. Recently, governments have begun to fund transnational research initiatives predicated on data pooling by scientists within an open-access model.¹³⁸ The creation of such autonomous semi-commons holds promising applications for research and innovation. But above all, government-mandated research commons illustrate the importance of open resources to engender efficient utilization of a vast database of scientific information for potentially significant applications to address some of the most enduring problems of this generation. Access to these applications should not be later impeded by the unconstrained exercise of IP rights by private actors who are beneficiaries of the public's largesse.

136. See *supra* Part III.

137. See *supra* Part I at note 14 and Part II at note 21. See also, e.g., GOLDSMITH & CRAWFORD, *supra* note 21; MCKINSEY, *supra* note 3; Rich, *supra* note 21; Diane Cardwell, *At Newark Airport, the Lights Are On, and They're Watching You*, N.Y. TIMES, Feb. 17, 2014, http://www.nytimes.com/2014/02/18/business/at-newark-airport-the-lights-are-on-and-theyre-watching-you.html?_r=0 (describing a technological platform being tested by the Port Authority of New York and New Jersey at the Newark Liberty International Airport, which “collects and feeds data into software that can spot long lines, recognize license plates and even identify suspicious activity, sending alerts to the appropriate staff”); S. Hyman, *Enforcement and Data: One New York City Agency's Vision for a Level Playing Field*, DATA SMART CITY SOLUTIONS, Aug. 13, 2013, <http://datasmart.ash.harvard.edu/news/article/enforcement-and-data-280> (discussing the New York City Business Integrity Commission's initiatives to “enable licensing and enforcement decisions driven by data”); D. Slack, *Computer System Quickens City Response to Complaints*, BOSTON GLOBE, May 27, 2009, <http://www.cityofboston.gov/news/Default.aspx?id=4601> (detailing a computer tracking system that has improved response time to citizen complaints in Boston).

138. See Okediji & Reichman, *supra* note 10.

V. CONCLUSION

A country's baseline rule on copyright ownership of government works may not reveal the true welfare commitments of its big data policies or other policies that support access to knowledge goods. For example, in the United States, works created by the federal government are not entitled to copyright protection, but the government in fact owns a significant amount of proprietary goods. Government ownership of IP is neither inherently "good" or "bad"—it is how the government uses or leverages its ownership interest to advance access by the public to newly created works that matters. The public welfare justifications that support the default public domain status of US government works under the 1976 Copyright Act have not proven to be superior policy for innovation, nor to facilitate the distributive justice goals of the IP system. In short, public domain status is not synonymous with the public welfare.

In contrast, the copyright laws of the United Kingdom and Australia formally grant protection to government works in the form of a Crown copyright, but several models have emerged that temper the impact of these copyright grants in government works and encourage robust public access. The same is true in other OECD countries that, for example, rely on modified CC licenses to ensure access, use, and dissemination of government funded works.

Open data policies that genuinely seek to maximize welfare gains from data-driven innovation should ensure that downstream applications of works created from free or heavily subsidized access to big data is available to the broader public at marginal cost or not much more. The government could give incentives to creators to ensure that the cost of access by the public reflects at least part of the value of the underlying data granted under an open data policy. This could be done by adopting CC or common use-licenses in conjunction with government ownership of copyright.

In the absence of clear legislative direction in the 1976 US Copyright Act about state government ownership of its copyrightable works, state governments arguably have greater leeway to experiment with a variety of approaches to link its open data policies to copyright ownership of works created from the data. Asserting proprietary rights in data-driven innovation would enable federal and state governments to develop appropriate conditions that ensure more members of the public have access to any new works created. While creators of such works may, like other copyright proprietors, leverage their exclusive rights to generate rent, the terms and conditions under which the exercise of proprietary rights occurs should be part of the government's design of innovation policy in an era of big data.

In sum, full and equal access to government works should be viewed as an indispensable feature of the welfare state in the digital era. A commitment to the elusive copyright balance requires reconsideration of copyright (and IP) baseline rules that merely maintain the status quo which preserves access for an elite minority, rather than investing in conditions that facilitate wealth creation through optimal access by many to the rich array of taxpayer-funded knowledge goods engendered by big data.