

THE USER RIGHTS DATABASE: MEASURING CHANGE IN COPYRIGHT USER RIGHTS

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ABSTRACT

International and domestic copyright law reform around the world is increasingly focused on how copyright user rights should be expanded to promote maximum innovation, creativity and access to knowledge in the digital age. These efforts are guided by a relatively rich theoretical literature. However, few empirical studies explore the social and economic impact of expanding user rights in the digital era. One reason for this gap has been the absence of a tool measuring the key independent variable – changes in copyright user rights over time and between countries. We are developing such a tool, which we call the “User Rights Database,” and which we have made available under an open license. This paper describes the methodology used to create the Database and the results of initial empirical tests using it. We find that all of the countries in our study are trending toward more open copyright user rights over time, but the wealthy countries in our sample are

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about thirty years ahead of developing countries on this measure. Our empirical tests find positive relationships between openness and innovative activities in information and communication technology industries, and the production of scholarly publications. We do not find evidence that opening user rights causes harm to revenue of copyright intensive industries like publishing and entertainment.

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I. INTRODUCTION

Copyright law is the subject of increasingly contested debates around the world. Much of this reform is being driven by a perceived need to adapt outdated copyright laws to the digital age. Copyright owners often advocate that these reforms should center on expanding the length, scope, and enforceability of exclusive rights. However, there is a growing recognition that the digital environment warrants expansions in so-called user rights – rights to use copyrighted material without the permission of owners to facilitate a range of modern activities from social media to Internet search.¹

Few empirical studies analyze the impact of different ways to expand user rights for the digital environment. One reason for the lack of empirical research on the impact of more open and flexible user rights has been the absence of a tool to measure changes in this variable of the law. To promote additional and enhanced research into the impact of user rights, we have created the User Rights Database. It is an open access repository of survey data that shows how and when copyright user rights have changed over time in a representative sample of different countries. The data is presented in both original and coded forms.

We have begun to use the User Rights database in empirical research projects. The first insight we draw is that there is a general trend toward more open user rights over time in all of the countries. The growth is unequal, however. Developing countries in our sample are now at the level of openness that existed in the wealthy countries about thirty years ago.

Another insight from our data is that very few countries have sufficient user rights needed to support creativity and innovation in the digital economy. These crucial digital exceptions include those permitting transformative and non-expressive uses, including for text- and data-mining. Countries with an open general exception, such as the U.S. fair use right, have been the quickest to authorize these new uses.²

We use the data in a series of econometric tests. Our results support the existing theoretical literature suggesting that more open user rights promote

¹ See, e.g., WIPO Copyright Treaty pmb., Dec. 20, 1996 (describing as a principle objective to promote “balance” between protections for copyright owners and user rights that serve “the larger public interest, particularly education, research and access to information”); Beijing Treaty on Audiovisual Performances pmb., Jun. 24, 2012 (identifying a need to “maintain a balance between the rights of performers in their audiovisual performances and the larger public interest, particularly education, research and access to information”); U.S.-Korea Free Trade Agreement art.18.4 n.11, June 30, 2007 (“For greater certainty, each Party may adopt or maintain limitations or exceptions to the rights described in paragraph 1 for fair use, as long as any such limitation or exception is confined as stated in the previous sentence.”); S. Rep. No. 114-42, at 17 (2015) (instructing “that U.S. trade agreements should contain copyright provisions that... foster an appropriate balance in copyright systems, inter alia by means of limitations and exceptions”).

² There are eight countries around the world that have a clause (whether called “fair use,” “fair dealing,” or something else) with the essential hallmarks of fair use. See Program on Information Justice and Intellectual Property, Appendix II: Examples of Flexible Limitations and Exceptions from Existing and Proposed Laws (2012), <http://infojustice.org/wp-content/uploads/2012/12/Appendix-II.pdf>.

innovation and creativity. Namely, we find:

- More open user rights environments have been associated with higher levels of research and development spending by firms in the information and communication technology (ICT) industries in a set of twelve countries. They may also be associated with higher levels of subsequent patenting by firms in the ICT industries.
- In the same set of countries, more open user rights environments have *not* been associated with harm to industries known to rely upon copyright protection, such as publishing and entertainment.
- Researchers in countries with more open user rights environments produce more scholarly output. However, there is no significant positive association between openness and the quality of publications.

The rest of this paper describes our database and our initial test in more detail. Section II surveys the existing theoretical literature that suggests that more open user rights promote innovation and creativity. Section III describes the methodologies we used to construct the User Rights Database. Section IV reports the methods and findings of our econometric analysis.

II. UNTESTED HYPOTHESES ON THE IMPACT OF USER RIGHTS

We do not know much about the impact of laws protecting copyright user rights.³ The field's early work on the benefits of user rights to overcome

³ Most of the economic literature on the impact of copyright focuses on other areas of copyright; such as the degree to which digital piracy may harm legitimate sales of works or the degree to which copyright strength incentivizes works. Compare Rahul Telang & Joel Waldfogel, Piracy and New Product Creation: A Bollywood Story, *Info. Econ. and Policy*, 1, 2-4 (2018) (finding that high levels of piracy depress the production of new Bollywood films), with Joel Waldfogel, Bye, Bye Miss American Pie? The Supply of New Recorded Music Since Napster, 1, 27-28 (Nat'l Bureau of Econ. Research, Working Paper No. 16882, 2011) (finding that increased file sharing through Napster led to no decrease in the creation of musical works), and Douglas Gomery, Research Report: The Economics of Term Extension for Motion Pictures, 1, 1-3 (1993) (finding that copyright term extensions for works for hire would harm users); see also Jeremy Reichman, The Duration of Copyright and the Limits of Cultural Policy, 14 *Cardozo Arts & Ent. L.J.* 625, 645-47 (1996) (finding that since there is rapid exploitation of cultural goods in the now digitized universe, the copyright term should arguably be shortened not extended); Raymond Shih Ray Ku et al., Does Copyright Law Promote Creativity? An Empirical Analysis of Copyright's Bounty, 62 *Vand. L. Rev.* 1669, 1671, 1680 (2009) (finding that the depression in the number of new copyrighted works created after 1991, may have been due to disruptive technologies and piracy not changes in copyright law); Cecil C. Kuhne III, The Steadily Shrinking Public Domain: Inefficiencies of Existing Copyright Law in the Modern Technology Age, 50 *Loy. L. Rev.* 549 (2009); I.P.L. Png & Qiu-hong Wang, Copyright Law and the Supply of Creative Work: Evidence from the Movies 1-2 (Apr. 2009) (unpublished working paper) (on file with the Nat'l Univ. of Sing.) (finding that copyright term extension and the European Rental Directive had no discernable impact on movie production). There are a handful of studies on the impact of copyright "strength". See C. Ann Hollifield et al., Copyright Consequences: Central European and U.S. Perspectives ch. 13, at 163-197 (Lee B. Becker & Tudor Vlad eds., 2003) (finding that stronger international copyright protection has been associated with the production of more print media).

market failure takes no position on the particular shape of user rights that may better serve that limited purpose.⁴ The benefits of different formulations of user rights in copyright law may be diffuse, and therefore hard to measure.⁵ But at least two major hypotheses one frequently hears in copyright debates appeared to us as testable. It is often claimed that adopting U.S.-style “fair use” rights may drive innovation and growth in the technology sector. It is also frequently claimed that user rights that are more open may create larger stockpiles of inputs for creators, leading to more local production of works of creativity. Before explaining our methodologies for testing these claims, we review some of the most useful literature we found on these topics.

A. *Innovation and Growth in the Technology Sector*

Those who rely on fair use often claim it is better for innovative businesses. Google, for example, has frequently and publicly explained that a core reason it grew its business in California instead of the UK is that fair use is more conducive to innovative enterprise than fair dealing. Why?

Fair use and fair dealing look a lot alike. They are both general exceptions in the sense that they apply to multiple different uses and purposes in a single user right. There is no real difference in the law between a fair “use” versus a “dealing.” Both broadly cover any potential use/dealing with a work that may be covered by a copyright protection (e.g. reproduction, display, communication, etc.). The main difference between them is that the UK right operates on a closed list of purposes. To be a fair dealing in the UK statute, one must be using the work *only* for the purposes of non-commercial research or study, criticism or review, or for the reporting of current events. The problem with this for innovators is that it does not include many modern purposes for which works are frequently – and fairly – used, such as indexing the Internet, reverse engineering software to create interoperable products, or

However, there is little literature studying the converse.

⁴ See Wendy Gordon, Fair Use as Market Failure: A Structural and Economic Analysis of the “Betamax” Case and Its Predecessors, 82 Colum. L. Rev. 1600, 1605 (1982) (noting that market failure literature generally finds theoretical economic justifications for free use rights when (and perhaps only when) markets lack sufficient mechanisms for information sharing and transaction-free exchanges to enable licensing on a willing buyer–willing seller model. Permitting free uses in such a context produces net gains to social welfare – transactions occur for no loss to the copyright owner); ; see also Dan Burk & Julie Cohen, Fair Use Infrastructure for Rights Management Systems, 15 Harv. J.L. & Tech. 42, 42-83 (2001) (considering rights management statutory infrastructure as a means to enable public access to works secured by rights management systems and how to overcome statutory design challenges posed by fair use). A related stream of literature theorizes that even piracy can produce net social benefits where it does not displace actual sales. See Carlos A. Primo Braga & Carsten Fink, Reforming Intellectual Property Rights Regimes: Challenges for Developing Countries, 1 J. Int'l Econ. L. 537, 537-54 (1998). But the justifications for user rights are much broader than market failure, even if we focus on its economic aspects. See Mark A. Lemley, Property, Intellectual Property, and Free Riding, 83 Tex. L. Rev. 1031, 1076 (2005) (describing the fallacy of overprotecting rights to eliminate all “free riding” and calling for a focus instead on the ultimate utilitarian justification of the minimum scope of exclusive rights consistent with giving due reward to creators to incentivize production and innovation).

⁵ Brett M. Frischmann & Mark A. Lemley, Spillovers, 100 Colum. L. Rev. 101, 101-43 (2006).

mining content for meta-data to create translation and other tools. Fair use is preferred because its list of permitted purposes is open.

This theme – that the openness of fair use is helpful for innovation and modern technology industries – appears in the literature. The basic idea is that laws that permit a larger scope for new technologies to use works in new ways, without previous approval by the legislature, promote investments in technological innovation.⁶ For the most part, this literature is theoretical rather than empirical. However, there is a small body of policy change studies in single countries and over a comparatively short period of time.⁷

A related literature describes the massive investments in the US economy from these so-called “fair use industries.”⁸ These industry studies do not actually claim that changes in fair use will necessarily alter the fair use industries in any way. The implication is made but not tested. Most of this literature also supports, but does not actually seek to test, that it is the openness of fair use that leads to the benefits they find.

B. Creativity and New Works

Another major argument in favor of fair use-like provisions is that they promote more and better works of creativity. It has been posited, for example,

⁶ See Fred von Lohmann, *Fair Use as Innovation Policy*, 23 *Berkeley Tech. L.J.* 1, 8 (2008) (describing “fair use” rights, by which he means generally any private copying rights, as providing a “reservoir of incentive” to the development of private copying technology industries from the VCR to the I-Pod); see also Michael Palmedo, *R&D Spending and Patenting in the Technology Hardware Sector in Nations With and Without Fair Use* (PIJIP Research Paper Series, Working Paper No. 02, 2017) (finding that technology hardware firms in countries with fair use spent more on research and development and received more patents); Joshua Lerner, *The Impact of Copyright Policy Changes on Venture Capital Investment in Cloud Computing Companies*, Computers and Communication Industry Association (2014), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.732.839&rep=rep1&type=pdf> (demonstrating how a court ruling clarifying copyright user rights increased venture capital funding to American cloud technology firms); Michael A. Carrier, *Copyright and Innovation: The Untold Story*, 891 *Wis. L. Rev.* 893, 894-959 (2012) (focusing on the strength of copyright enforcement rather than exceptions, finding that aggressive online enforcement deterred venture capital funding for new technologies related to online music sharing).

⁷ See Roya Ghafele & Brooke Friedman, *A Counterfactual Impact Analysis of Fair Use Policy on Copyright Related Industries in Singapore*, 3 *Laws* 327, 328-49 (2014) (finding that technology hardware firms in Singapore enjoyed faster growth after the nation’s introduction of fair use in 2006); see also Lerner, *supra* note 7 (finding that clarification of fair use of remote DVR providers led to an explosion of investment into what is now the cloud storage industry); Barbara Biasi & Petra Moser, *Effects of Copyright on Science: Evidence from the WWII Book Replication Program* (Sept. 14, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2542879 (using a natural experiment to test the relationship between unfettered access to science knowledge and research output; the U.S.’s suspension of copyright on German science publications during World War II drove subsequent innovations that can be found in patent citations to these German works).

⁸ Andrew Szamosszegi & Mary Ann McCleary, *Fair Use in the U.S. Economy*, Computers and Communication Industry Association (2017), <https://www.cciinet.org/wp-content/uploads/2017/06/Fair-Use-in-the-U.S.-Economy-2017.pdf> (employing WIPO’s methodology for the study of copyright industries to those that rely on copyright exceptions, in the U.S., finding that they employ 18 million workers and accounted for 16% of the U.S. economy).

that scholars and firms engaged in research will produce more in countries that allow greater rights to access and use published works.⁹ Others explain how greater user rights may contribute to the quality or value of creative output.¹⁰ However, little of this literature zeros in on the particular attributes of user rights that may be better or worse at promoting the ends they identify.

There is a small-but-growing body of empirical (as opposed to theoretical) work in this area. Studies have shown that more text and data mining research is published from countries that have adopted rights to use works for these purposes.¹¹ Survey evidence has shown that knowledge of fair use rights among US filmmakers leads to higher production values of their films;¹² and correlatively that lack of knowledge of user rights (namely

⁹ Andrew Gowers, *Gowers Review of Intellectual Property*, HM Treasury (2006), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/228849/0118404830.pdf (asserting that stronger research exceptions "create greater scope for research on protected material by universities and business and expand the stock of knowledge"); see also Joanna Adcock & Edward Fottrell, *The North-South Information Highway: Case Studies of Publication Access Among Health Researchers in Resource-Poor Countries*, Global Health Action, Coaction Publ'g (2008) (surveying health researchers from nine low income countries, finding that poor access to current literature in their fields lessened their published output); Ana Langer et al., *Why Is Research from Developing Countries Underrepresented in International Health Literature, and What Can Be Done About It?*, 82 *Bull. World Health Organ.* 797, 797-803 (2004) (highlighting limited access to published literature as a barrier to further research into diseases prevalent in poor countries); Biasi, *supra* note 9 (using a natural experiment to test the relationship between unfettered access to science knowledge and research output; the U.S.'s suspension of copyright on German science publications during World War II drove subsequent innovations that can be found in patent citations to these German works).

¹⁰ Christophe Geiger, *Promoting Creativity through Copyright Limitations: Reflections on the Concept of Exclusivity in Copyright Law*, 12 *Van. J. Ent. & Tech. L.* 515, 515-16 (2010) (arguing that broader rights to use copyrighted materials may lead to higher production values in creative communities); see also Matthew J. Baker & Brendan M. Cunningham, *Court Decisions and Equity Markets: Estimating the Value of Copyright Protection*, 49 *J.L. & Econ.* 567, 567-596 (2006) (testing the effect of court cases on the value of copyright works); Yauhiro Arai & Shinya Kinukawa, *Copyright Infringement as User Innovation*, 38 *J. Cult. Econ.* 131, 131-144 (2014) (studying Japanese Dojinshi and finding value created by these derivative works. It is notable that in Arai and Kinukawa's model, producers of originals can maximize their welfare by ignoring Dojinshi even if transactions costs fall).

¹¹ See Christian Handke et al., *Is Europe Falling Behind in Data Mining? Copyright's Impact on Data Mining in Academic Research*, (June 7, 2015), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2608513 (finding that data mining makes up a higher share of research output in countries with data mining user rights and vice versa for countries that require express consent of the rightsholder); see also Sergey Filippov, *Mapping Text and Data Mining in Academic and Research Communities in Europe*, The Lisbon Council (2014) (comparing the lack of text and data mining practices in Europe against countries like the United States and China who are leading the advancement of text and data mining publications); Ian Hargreaves et al., *Report from the Expert Group on Standardisation in the Area of Innovation and Technological Development, Notably in the Field of Text and Data Mining*, European Commission (2014) (finding that text and data mining tools are an important research technique that represents a significant economic opportunity for the European Union); see generally Jerome Reichman & Ruth Okediji, *When Copyright Law and Science Collide: Empowering Digitally Integrated Research Methods on a Global Scale*, 96 *Minn. L. Rev.* 1363, 1365-66 (2012) (justifying the need for extraction and reuse of pertinent scientific data); Ian Hargreaves, *Digital Opportunity: A Review of Intellectual Property and Growth* (2011) (illustrating the importance of text and data mining exceptions specifically to medical professionals).

¹² Patricia Aufderheide & Peter Jaszi, *Reclaiming Fair Use: How to Put Balance Back*

Table 1: Summary of Previous Literature

Theme	Author	Hypothesis
Investment, innovation, and technology firm performance	Von Lohmann	Fair use leads to greater innovation – non-empirical
	Palmedo	Fair use leads to more R&D spending & patents in tech hardware
	Lerner	Clarification of user right led to more venture capital in cloud sector
	Carrier	Aggressive copyright enforcement depressed innovative investments
	Biasi and Moser	Access to more works led to more innovations drawing on them
	Ghafele and Gilbert	Fair use led to positive outcomes in Singapore
Creativity and new works	Aufderheide and Jaszi	Utilizing fair use raises film production values
	Geiger	More robust copyright exceptions lead to more creative works
	Aria Kinukawa	Greater openness in copyright leads to more creative works
	Handke, Guibault, Vallbé	Copyright limitations for text and data mining shape research output
	Filippov	Copyright limitations for text and data mining shape research output
	Hargreaves 2014	Copyright limitations for text and data mining shape research output
	Hargreaves 2011	Copyright limitations for text and data mining shape research output
	Reichman & Okediji	Researchers need better access to research and data
	Adcock and Fottrell	Lack of access to copyrighted journals hinders medical research
	Langer et al	Lack of access to copyrighted journals hinders medical research

the quotation right) in South Africa has depressed production values.¹³

Both fields of empirical studies of copyright user rights – the study of innovation and of output – are relatively small especially compared to research on piracy or copyright strength. And both could benefit from cross-country, multi-period studies on the impact of particular definitions of copyright user rights.¹⁴

in Copyright, University of Chicago Press (2018) (recounting examples where knowledge and use of fair use by filmmakers led to increased value productions).

13 Sean Flynn & Peter Jaszi, *Untold Stories in South Africa: Creative Consequences of the Rights Clearance Culture for Documentary Filmmakers* PIJIP Research Paper No. 20, 2010) (illustrating the perceptions of South African filmmakers who believe that current copyright laws “discourage certain kinds of storytelling, and decreases production value because the “clearance culture” instills the concern that use of all copyrighted material needs to be cleared).

14 National Research Council, *Copyright in the Digital Era: Building Evidence for Policy* (Stephen A. Merrill et al. eds. 2013) (uncovering that empirical evidence on the effects of infringing copying and distribution to social welfare as varying across industries, countries, and times is lacking). For an example of the kind of work that is lacking in the area of user rights, see Walter G. Park, *The Copyright Dilemma: Copyright Systems, Innovation and Economic Development*, 64 *J. Int’l Aff.* 53, 64 (2010) (identifying that current research focuses on how patent protection and not copyright protection affects technological progress and economic development).

III. DEVELOPING THE USER RIGHTS DATABASE

In 2013, American University convened a group of copyright economists and policy researchers that study copyright user rights to discuss ways to state of the field, and areas where future research was needed.¹⁵ One problem stood out – there was no source describing changes in laws across countries and over time that one could use as an independent variable in empirical projects. Therefore, we decided to develop a database with this information.

A. Mapping Openness, Flexibility & Generality

We began our research by identifying countries with and without fair use rights modeled on Section 107 of the U.S. Copyright Act.¹⁶ These include some (but not all) countries that refer to “fair use” in their laws, as well as some countries with laws that refer to “fair dealing” – terminology alone could not define who did and did not have a “fair use” right. As Band shows, for example, some “fair dealing” countries, e.g. Singapore, have an open general exception that is more like the US fair use right than UK fair dealing.¹⁷ On the other hand, Bangladesh and Uganda both have provisions in their laws labeled “fair use” that are only applicable to certain purposes, and therefore do not meet our definition of the term.¹⁸

We collected and analyzed a large number of copyright laws from around the world,¹⁹ and we quickly realized that openness to purpose is not unique to fair use rights. For instance, South Africa’s quotation right permits the quoting of any work, in any other work, for any purpose, subject to compliance with “fair practice.” We found that many countries’ laws – indeed most – have one or more exceptions with at least one of the following elements often associated with fair use:

- *Openness*: the user right can be applied to an open, as opposed to a defined (aka closed), list of purposes, uses, works or users;
- *Flexibility*: the user right is applied through a flexible proportionality test that balances the interests of the rights holder with those of the user and general public;
- *Generality*: the exception promotes uniform application by applying a single flexible test to a group of uses or purposes.

¹⁵ Information regarding the meeting on the Law and Economics of Copyright User Rights held on September 26, 2013 is available at <http://www.pijip.org/events/law-and-economics-of-copyright-users-rights/>.

¹⁶ See note 6; Palmedo (2016) looking at R&D spending and patenting activity by tech firms in fair use countries.

¹⁷ Jonathan Band & Johnathan Gerafi, *The Fair Use/Fair Dealing Handbook* (March 2015), <http://infojustice.org/wp-content/uploads/2015/03/fair-use-handbook-march-2015.pdf>.

¹⁸ *Ibid.*

¹⁹ See Program on Information Justice and Intellectual Property, *Masterlist: Limitations and Exceptions Provisions in National Laws* (2017), <http://infojustice.org/wp-content/uploads/2017/07/Master-List-Version-06192017.pdf>. The project also reviewed past studies and convened legal and economic members of the Global Expert Network on Copyright User Rights in several workshops to discuss research methodologies.

Using these three concepts, we can distinguish between different operative elements of user rights without relying on their own terminology. The U.S. fair use right in Section 107 is open (in each dimension), flexible, and general. The UK fair dealing clause is a flexible, general exception – but it is not open to any purpose. The South African quotation right is open to any purpose and is flexible, but is not open to any kind of use and is not general.

B. Over Time

There are a small number of useful resources that distinguish elements in the design of user rights. There are extensive studies of differences in the formulations of common law (aka “fair use” and “fair dealing”) and civil law “closed list” exception systems.²⁰ Others have catalogued fine differences between the wording of laws within “fair use” and “fair dealing” countries – interestingly reporting the lack of difference between the two categories.²¹ However, none of these resources track changes in the elements they describe over time. To enable a range of empirical – especially econometric – methodologies, we want to know not only how policy contexts differ between countries now, but also how (and when) they have changed.

C. Through an Expert Survey

Since 2011, we have been coordinating the Global Expert Network on Copyright User Rights, a group of experts from around the world conducting research and providing technical assistance on the value of user rights to society.²² Our research program at American University is also an affiliate of the Creative Commons Affiliate Network, which has a “legal lead” in scores of countries around the world. From these networks, we sought individuals willing and able to chart the history of openness, flexibility and generality of copyright user rights in their countries’ laws through an extensive survey.²³

²⁰ See, e.g., Max Planck Instit. for Innovation and Competition; World Intellectual Property Organization (WIPO), Standing Comm. on Copyright and Related Rights (SCCR), Study on Copyright Limitations and Exceptions for Libraries and Archives, SCCR/30/3 (June 10, 2015); see also WIPO, SCCR, Draft Study on Copyright Limitations and Exceptions for Educational Activities, SCCR/32/4 (May 9, 2016); WIPO, SCCR, Updated Report on the Questionnaire on Limitations and Exceptions, SCCR/21/7 (Oct. 2, 2010).

²¹ See Band & Gerafi, *supra* note 17, at 55, 66 (reporting that the “fair use” general exception in Uganda is not open to application to a use for any purpose, but the “fair dealing” general exception in Singapore is).

²² The names of the founding network members are identified at <http://infojustice.org/flexible-use>. Currently the network is much larger – including over 80 individuals from over 50 countries.

²³ The names of the respondents and their completed surveys are available at <http://infojustice.org/survey>.

Table 2: Twenty Categories of Copyright User Rights

General Exception	Parody and/or Satire
Quotation	Incidental Inclusion
Education	Panorama Right
Research	Orphan Works
Personal or Private Uses	National Government Works
Use of Computer Programs	Exhaustion of Rights
Databases or Other Compilations of Non-Original Facts	Safeguards from Secondary/ISP Liability
Text and Data Mining	Temporary Copies for Technological Processes
Library Rights	Protection Against the Supremacy of Contracts
Disability Access	
Transformative Use	

Our survey asks detailed questions about twenty categories of user rights common in many copyright systems, listed in Table 2. For each user right, it asks when a country’s law permitted various dimensions of openness (e.g. to works, purposes and users), as well as whether and when the exception was subject to a flexible balancing test. An example of one page of the survey is included as Figure 1.

Our survey collects over 120 inputs about the construction of user rights in each country between 1970 and 2016, providing a rich source for measuring change.²⁴ The period 1970-2016 is intended to capture the modern period in copyright law reform, coinciding with the adaptation of technologies like the photocopy machine and videocassette recorder through the present.

The survey is designed to capture all relevant changes in the law, whether or not they were included in the statute itself.²⁵ It is designed to identify user rights protected by a “limitation,” “exception,” definition of the scope of protection, or elsewhere. Respondents are instructed to define both “law” and “user rights” “broadly to document the full range of legal permission to use copyright material without authorization that exists in all facets of law.”²⁶

²⁴ The instrument is available at <http://infojustice.org/survey>.

²⁵ In many countries, judicial or administrative rulings may change the openness of user rights. Canada is a place where this has happened recently. See Michael Geist, *The Copyright Pentology: How the Supreme Court of Canada Shook the Foundations of Canadian Copyright Law* (Michael Geist ed., 2013).

²⁶ We used the following definitions:

“Law” is meant to include all authoritative, published rules or interpretations. Such law may include statutory law, administrative regulations or directives, decisions by courts, enforcement agencies, or others.

“User rights” is defined as any functional permission to use copyright protected material without authorization of the right holder. User rights may exist in any part of the

Fig. 1: Screen shot of Question 1, PIJIP’s Copyright User Rights Survey

1. General Exception

Instructions:

Column#1) Enter the ranges of years since 1970, if any, when the law included a general exception for the use of copyrighted works

Column#2-6) Enter the ranges of years since 1970, if any, when the characteristics listed in the column headers applied to the general exception

Column#7) Provide citations to the law (including legislated law, regulations, and court cases) that support your answers

	(1) Exception recognized	(2) Open to any purpose	(3) Open to commercial uses	(4) Open to use of any type of work	(5) Open to any type of user	(6) Subject to a balancing test	(7) Citations
Clearly Included							
Mostly/Probably Included							
Mostly/Probably Not Included							
Not Included							

(8) Comments:

The survey is designed to capture the fact that “changes in the law often occur through periods of re-interpretation in which there may be periods of ambiguity.”²⁷ This is particularly, but not only, the case in common law countries.²⁸ We therefore asked respondents for their “judgment on the degree of clarity in the law in regard to each user right” on a four-point spectrum between “not included” and “clearly included.”

We actively recruited inputs from a diverse set of countries from different regions, legal systems, and development levels. To date, we have received usable responses from an initial 21 countries. Roughly half of the countries in the data set are middle-income countries.²⁹

law, including in limitations or exceptions to protection, in definitions of the scope of protection or of copyrightable subject matter, in automatic remuneration schemes (a.k.a. liability rules or statutory licenses), and in protections from liability or enforcement. User rights may exist within copyright specific statutes or decisions, or by virtue of other areas of law, such as constitutional rights, competition, consumer protection, or other fields of law.

²⁷ Program on Information Justice and Intellectual Property, Copyright User Rights Survey 1, 2 (2016), <http://infojustice.org/survey>.

²⁸ Although there may be formal distinctions in the treatment of judicial precedent between civil and common law countries, all of our civil law experts opined that judicial action can and does change the effective operation of the law in civil law countries. In Brazil, for example, a series of judicial decisions has had the effect of recognizing an open, flexible, and general exception even without statutory change or a formal system requiring the following of judicial precedent. See survey response of Allan Rocha de Souza from Brazil, available at <http://infojustice.org/survey>.

²⁹ The experts who contributed to the study include: Beatriz Busaniche, Argentina; Kimberlee Weatherall, Australia; Enyina S. Nwuhce, Botswana; Allan Rocha de Souza, Brazil; J. Carlos Lara, Chile; Hong Xue, China; Marcela Palacio-Puerta, Columbia; Taina Pihlajarinne & Anette Alén-Savikko, Finland; Shamnad Basheer & Pankhuri Agarwal, India; Tatsuhiko Ueno & Ayuko Hashimoto, Japan; Heesob Nam, Korea; Marco Caspers, Netherlands; Miguel Morachimo, Peru; Teresa Nobre, Portugal; Daniel Seng & David Tan, Singapore; Zuzana Adamová, Slovak Republic; Caroline Ncube, South Africa; Simon Schlauri, Switzerland; Maksym Naumko & Andriy Bichuk, Ukraine; Rami Olwan, United

Table 3: Completed Responses to Copyright User Rights Survey

11 High Income Countries	10 Middle Income Countries
Australia	Argentina
Chile	Botswana
Finland	Brazil
Japan	China
Netherlands	Colombia
Portugal	India
Singapore	Peru
Slovakia	South Africa
South Korea	Ukraine
Switzerland	Viet Nam
United States	

After receiving each completed survey, we reviewed them and corresponded with authors to clarify answers. Law student researchers cite-checked each response. We then coded completed surveys, giving a score of 0 where a law did not have a particular element, up to a 3 if the law “clearly” had the element.³⁰ The final survey responses are posted online in both original and coded form.³¹

The outcome is the User Rights Database. To our knowledge, it is the only compilation of information on change in the fine details of copyright user rights over time in a broad set of economies. We plan to expand the database with data on legal change in more countries over time – but our publishing this initial version fills a gap in available research tools for studying the impact of copyright policy. The remainder of the paper will demonstrate some of the uses of the data.

IV. RESULTS AND ANALYSIS

Having constructed the database, we set out to examine changes in copyright user rights law, and to run initial tests of these changes’ impacts.

Our findings indicate:

- There is a general trend toward more open user rights over time in all of the countries. However, the middle income countries in our sample have less openness in their law than the high income ones and are becoming more open at a slower rate;
- More open user rights environments have been associated with

Arab Emirates; Peter Jaszi, United States; Nhan T.T. Dinh, Vietman. The study and responses are available at <http://infojustice.org/survey>.

³⁰ 1 and 2 indicate it is “probably not” or “probably or mostly” present.

³¹ See <http://infojustice.org/survey>.

higher levels of R&D spending and patenting in the ICT industries in a subset of the countries represented in our database, but have *not* been associated with harm to copyright-intensive industries;

- Researchers in countries with more open user rights environments produce more scholarly works, though not higher-quality works (based on citations-based metrics of quality).

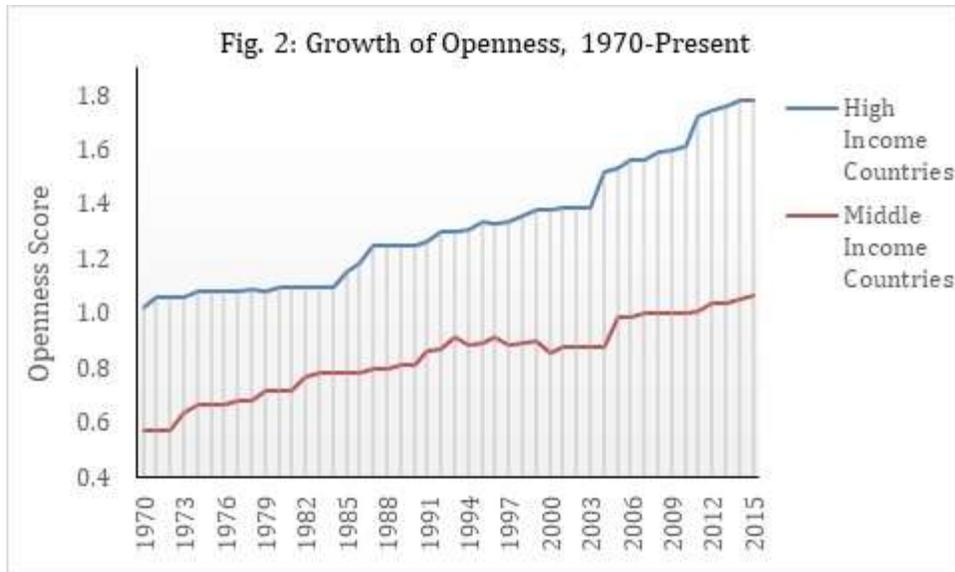
A. Trends in User Rights Reform

1. The Development Gap

In our sample, all of the countries have moved toward more open user rights over time.³² Even where countries focus on specific exceptions, such as those for education, there is a trend toward exceptions that are open to different works, uses, and purposes. All countries' laws, in this sense, are becoming more open, but they are not all becoming more open at an equal pace.

To study the openness of copyright laws in our respondent countries, we combine the 76 questions pertaining to openness of various exceptions into an "Openness Score," the unweighted average of the coded answers for each year. Figure 2 reports the average scores of two subsets of respondent countries – the 11 high-income and 10 middle-income countries in our set. A value of 3.0 would indicate that every user right is fully open to all works, uses, and users. On average, there is a clear upward (toward more open) trend for both the high- and middle-income subsets, indicating a greater opening of user rights provisions across the board. However, the high-income countries in our study have more open user rights in their laws, and the gap between them and developing countries has been growing since the early 1990s.

³² For a recent discussion of this trend, see Peter K. Yu, *Customizing Fair Use Transplants* (Tex. A&M Univ. Sch. of Law Legal Studies Research Paper No. 17-78, 2018).

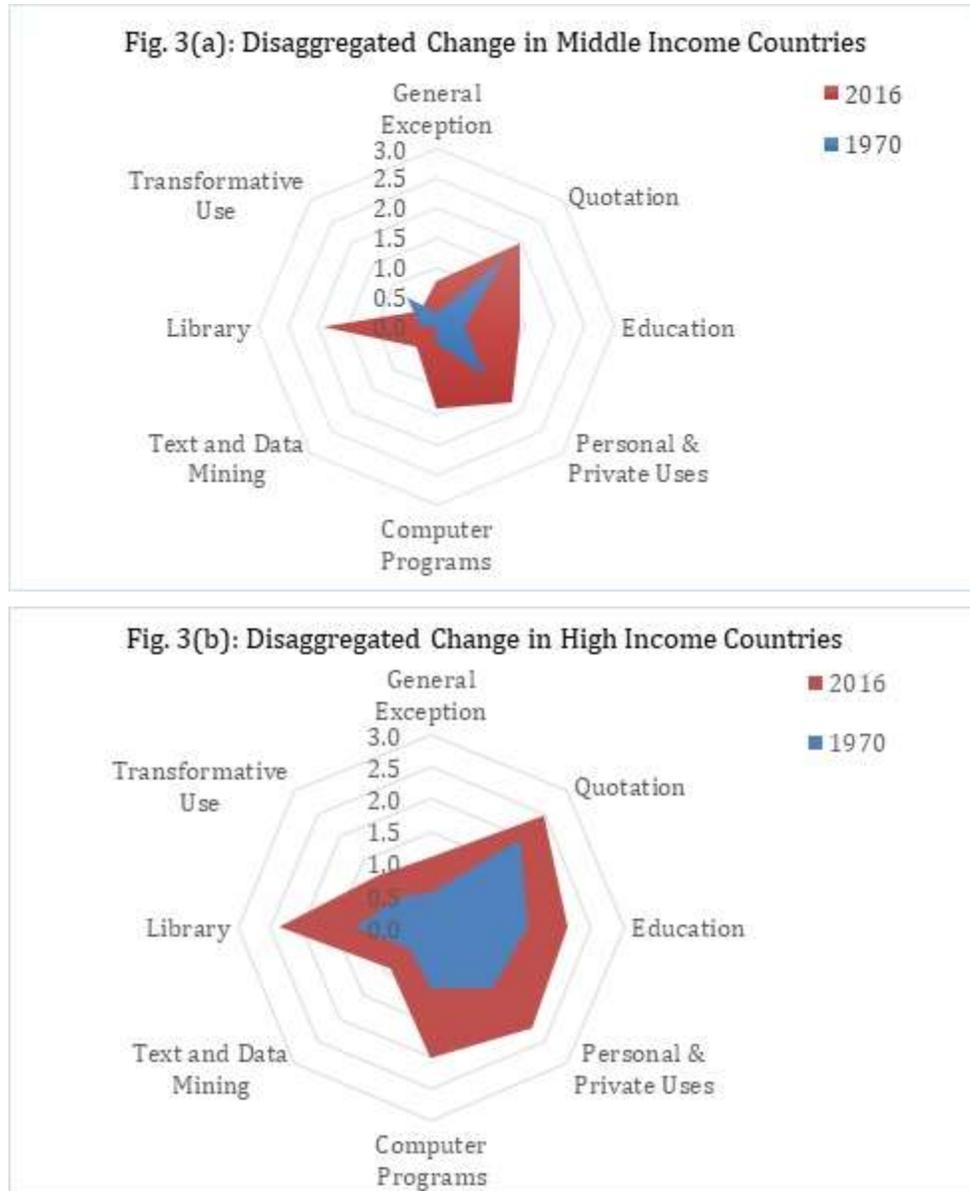


2. The Digital Gap

This section demonstrates another use of the dataset. Instead of looking at an aggregate Openness Score built on information about many different copyright exceptions, here we focus on the openness of eight specific copyright limitations related to the tech sector.

It is commonly posited by policy makers and advocates that it is the digital environment that is demanding change. One might therefore expect to see in the data a trend toward adoption of some of the categories of user rights that are most enabling of digital technology and Internet culture. We searched for trends toward adopting new digital rights, including rights to transformative uses – uses that transform material into totally new works, like a mash-up – and to use works for “non-expressive” purposes, such as for text and data mining.³³ But adoption of such rights is rare, and is concentrated in the countries with open general exceptions.

³³ See Matthew Jockers et al., *Digital Archives: Don't Let Copyright Block Data Mining*, 490 *Nature* 29-30 (October 4, 2012); see also Matthew Sag, *Copyright and Copy-Reliant Technology*, 103 *Nw. Univ. L. Rev.* 1607, 1607–82 (2009).



Figures 3(a) and 3(b) show the average openness in eight subsections of the overall openness score. The origin of each is zero. The center of the radar graph thus represents an openness score of zero for each area of user rights. The maximum value for each is three, which would indicate that a particular limitation is fully open to any user, any type of work, and for any purpose. Figure 3(a) shows the average from the middle-income countries in our sample, and figure 3(b) shows the average for the high-income countries. In each, the blue area represents the scores from 1970 and the orange represents the scores from 2016. In both subsets of countries, there is more openness in quotation, education, personal use, and library exceptions. Few countries, and almost no developing countries, have sufficient user rights most needed to support the digital economy, including for transformative use or text- and datamining, or a general exception that can adapt to new technologies.

B. The Impact of Open User Rights

Having established the upward trend of our Openness Score, we set out to test two hypotheses about the potential effects of countries' adaptation of more open copyright user rights.

First we explore the relationship between openness in user rights and innovation in the ICT industries. ICT firms, already known to be reliant on copyright user rights, will be free to engage in more types of research and to develop more types of products when they are less likely to run afoul of copyright laws. Therefore, we hypothesize that greater openness in copyright user rights will lead to more innovative activities, and ultimately more innovative outputs, by firms in these industries. In this section, we also seek evidence of harm to the copyright industries in the same set of countries.

Second, we look at the relationship between openness in user rights and the creation of new works of scholarship. In the field of academic writing, the knowledge found in existing journal articles and books is an input into creation of new works, and access to this input can be expensive. We hypothesize that greater openness in copyright exceptions will allow greater access to existing works and will therefore assist the creation of new ones.

1. The Impact of Openness on the Information and Communications Technology Industries

- a. Openness and R&D Spending by Business Enterprises

To test the hypothesis that greater openness in copyright limitations is associated with more innovative activities, we first look at its relationship with R&D spending by ICT business enterprises using country-level data from the European Union's PREDICT dataset.³⁴ This source contains data from "official sources (such as National Accounts and R&D statistics from Eurostat and OECD)" for all EU countries, as well as 12 other comparator countries. This overlaps with 12 of the countries in PIJIP's Copyright User Rights Database: Australia, Brazil, China, Finland, India, Japan, Korea, the Netherlands, Portugal, Slovakia, Switzerland, and the United States. The countries from database which are not represented in this set of R&D data are the smaller non-European economies. Annual data is generally available from 2000 on, though data as far back as 1995 is available for some countries. Additionally, Brazil has data only for 2008 and 2011, and Switzerland has data only available for 2008 and 2012. Though PREDICT presents data in current Euro, all monetary data used in these regressions has been converted to constant Euro using the deflator from the St. Louis Fed.

The PREDICT Dataset includes data for the "comprehensive" ICT sector and the "operational" ICT sector. The comprehensive sector adheres to the

³⁴ The data is available at <https://ec.europa.eu/jrc/en/predict/ict-sector-analysis-2018/data-metadata>

Table 4: Industries included in the PREDICT database’s operational definition of the ICT sector

ICT Manufacturing industries
Manufacture of electronic components and boards
Manufacture of computers and peripheral equipment
Manufacture of communication equipment
Manufacture of consumer electronics
ICT Service industries
Telecommunications
Software publishing
Computer programming, consultancy and related activities
Data processing, hosting and related activities; web portals
Repair of computers and communication equipment

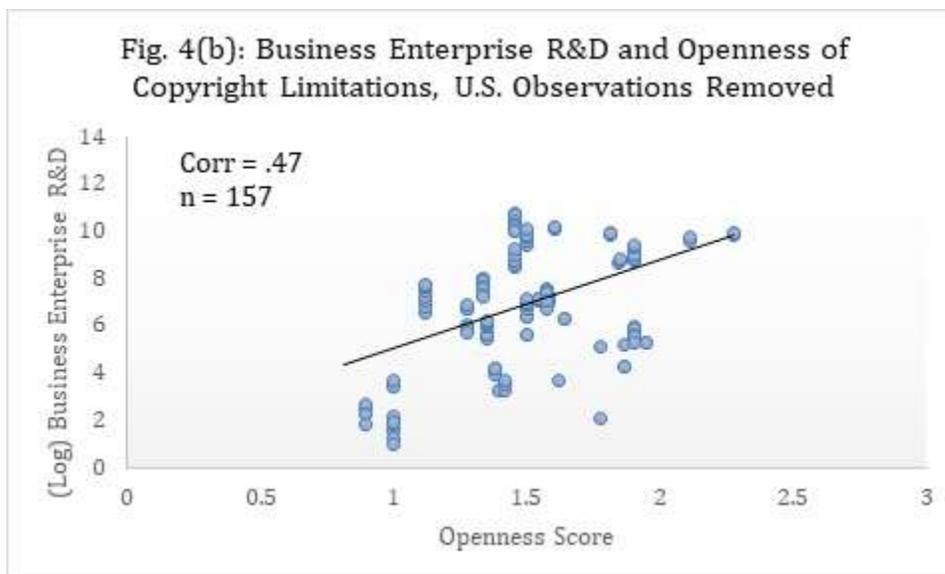
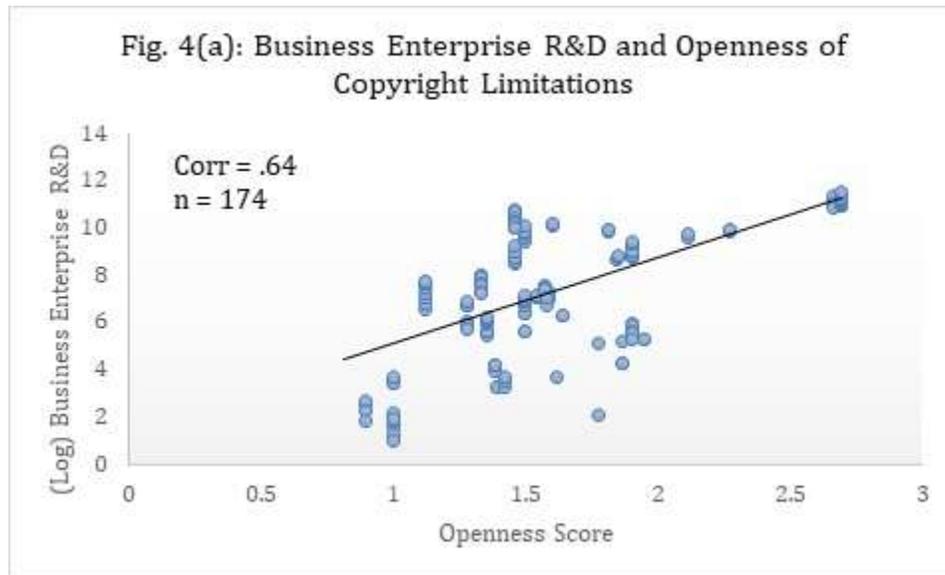
OECD definition of the ICT industries, which includes ICT manufacturing industries, ICT trade industries and ICT services industries. The operational ICT sector is a subset of the comprehensive, which omits the manufacture of optical media and the ICT trade industries (such as wholesale and retail specializing in hardware). The operational dataset is less disaggregated, but it is available for more periods, especially for the non-EU countries. For this reason, the following analysis uses the operational definition of the ICT sector. Table 4 shows the industries included in the national ICT business enterprise R&D figures.

Figure 4(a) shows the correlation between the logged value of Business Enterprise Research and Development (BERD) spending and the Openness Score described in the previous section. The cluster of points in the upper right are from the U.S., which may be somewhat of an outlier. Therefore Figure 4(b) shows the correlation with U.S. observations removed. In both cases, there is a clear positive relationship between the variables ³⁵

We next run panel regressions with country and year fixed effects to test the general correlation with controls for other major factors that could account the level of R&D spending by firms. The independent variable of interest, *Openness*, is our survey-based Openness Score. Employment controls for the size of the sector and previous-period gross output controls for the income of the ICT industries. We use EU data on GDP and World Bank data population to control for country wealth and size (the former is converted to GPD per capita).

We also want to control for the strength of copyright, because copyright

³⁵ Note that a one-unit increase in our openness score is a very substantial increase in the actual openness of limitations in a country’s copyright law, since our Openness Score runs from 0 to 3.



limitations may be more important in countries with stronger copyright laws. To do this, we use a variable based on an index of copyright strength developed by AU economics professor Walter Park and Tad Reynolds.³⁶ The index is comprised of 21 factors related to duration, usage, and enforcement of copyright, and membership in various copyright treaties. It covers the strength of copyright in 118 countries (not including the United States) from

³⁶ Available online at http://fs2.american.edu/wgp/www/?_ga=2.33750561.1651042385.1528731157-1650226975.1521642567

Table 5: Ordered List of Country by Park-Reynolds Copyright Index

Country	Copyright Index, 1995	Country	Copyright Index, 2011
Slovakia	1.69	India	2.27
China	2.04	Slovakia	2.78
India	2.27	China	3.12
Portugal	2.37	Brazil	3.18
Brazil	2.71	Australia	3.44
Australia	2.80	Portugal	3.48
Netherlands	2.85	Netherlands	3.58
Finland	3.18	Switzerland	3.61
Japan	3.18	Japan	3.7
Korea	3.21	Finland	3.75
Switzerland	3.38	Korea	3.89

1989 through 2011. On average, the countries' index scores tend to rise over time, and the developed countries tend to have higher scores than the developing ones – qualities similar to our copyright index.

In order to avoid problems related to multicollinearity, we order the countries from lowest to highest in 1995 (the first year of data from the PREDICT dataset) and 2011 (the last year of data in the copyright index). Table 5 shows the ordering. Though there is change in the placement from one country to the next, the countries with the five highest scores are the Netherlands, Switzerland, Japan, Finland and Korea in both time periods. We create a dummy variable *StrongCopyright* which is equal to one for these countries in each year from 1995 to 2015. In order to include the United States, we note that the U.S. Chamber of Commerce Global Intellectual Property Index³⁷ ranks the U.S. as having the strongest copyright protection out of the 50 countries it reviews, and we set *StrongCopyright* equal to 1 for the observations from the U.S.

Table 6 reports the regressions results. Columns (1) to (3) do not include the control for copyright strength, and columns (4) to (6) include it in the interaction variable *StrongCopyright*.

In each specification, the coefficient on *Openness* is positive and significant at the 90% level or better, despite the fact that the number of observations is low. The results suggest that a one-unit rise in the openness score is associated with large increases in R&D by businesses in the ICT sector, though it bears repeating that a one “unit” increase in the openness score is substantial given the scale of 0-3. The interaction term *Open*CopyrightStrength* is insignificant in the second three specifications. The coefficient on logged employment is positive and significant at the 95% level or better, as expected, but none of the other controls are significant.

³⁷ Available at <https://www.uschamber.com/report/us-chamber-international-ip-index>

Table 6: Dependent Variable – Logged Business Expenditure on R&D in the ICT Sector

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Openness	1.309*** (0.533)	1.304** (0.529)	1.105* (0.580)	1.632*** (0.453)	1.685*** (0.463)	1.448** (0.650)
Openness*StrongCopyright				-0.757 (0.937)	-0.896 (0.999)	-0.686 (1.054)
(Log) Employment	1.664*** (0.361)	1.322*** (0.331)	1.348** (0.488)	1.549*** (0.318)	1.132** (0.382)	1.178** (0.508)
L. (Log) Gross Output		0.162 (0.216)	-0.108 (0.239)		0.186 (0.239)	-0.079 (0.251)
(Log) GDP per capita			0.322 (0.488)			0.329 (0.474)
(Log) Population			1.477 (1.444)			1.330 (1.450)
Constant	-4.982** (1.944)	-4.725* (2.352)	-26.16 (26.10)	-4.078* (2.002)	-3.586 (2.217)	-22.74 (25.99)
Observations	174	171	164	174	171	164
Within Entity R ²	0.432	0.402	0.400	0.440	0.412	0.405
Country & Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

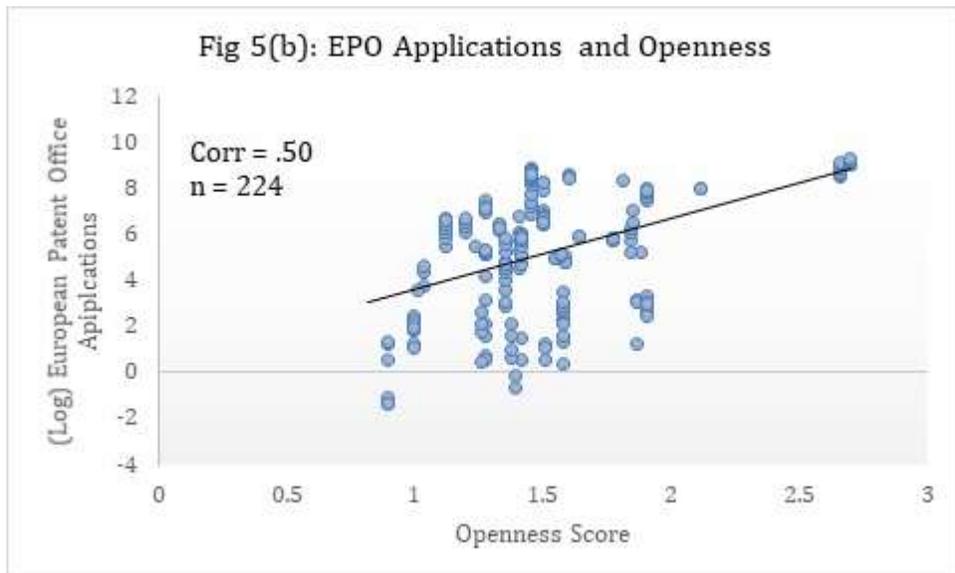
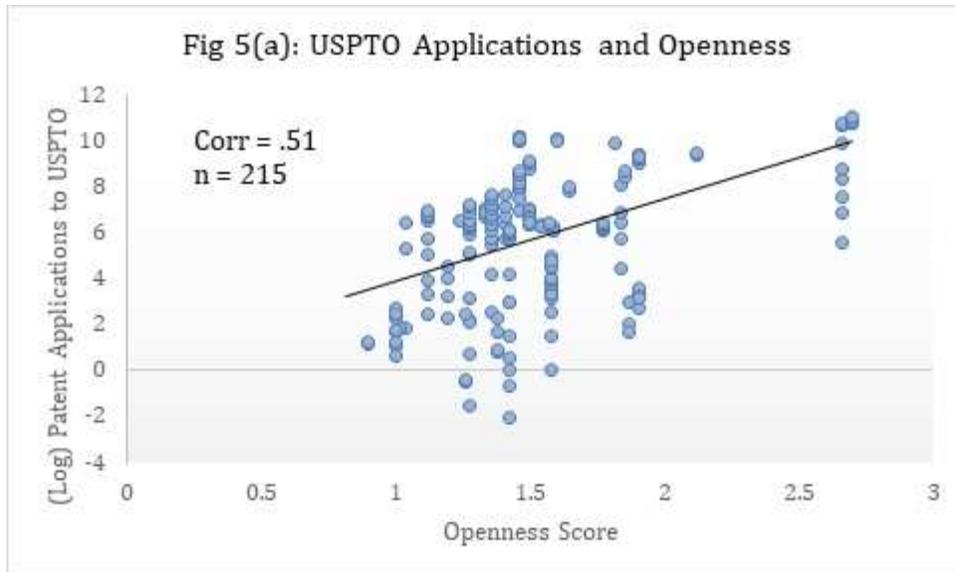
*** p<0.01, ** p<0.05, * p<0.1

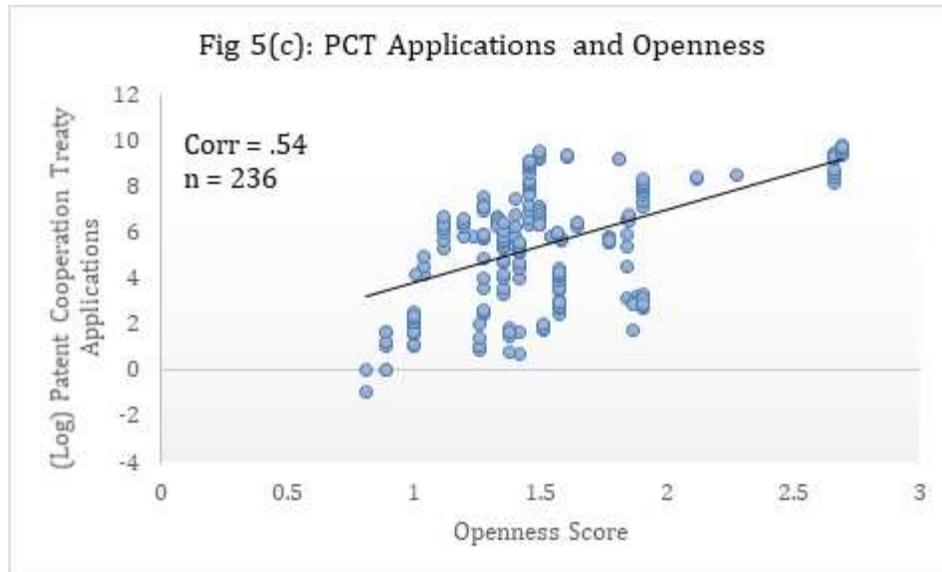
The within-entity R-squareds indicate that the model describes about 40% of the variation within the panels. However, most of the variation in the dataset is due more to unobserved differences between countries rather than changes in either copyright law or the controls. There is an interclass correlation of 96% or higher for each of the specifications.

Overall, the results suggests that, for the 12 countries for which we have data, the positive association between openness of copyright and business enterprise R&D in the ICT sector is significant and robust to the inclusion of controls.

In order to gauge the relationship between openness and innovative outputs, we look at the relationship between openness and patenting activity by ICT firms in the same set of countries. We use data from the OECD, which matches technology class codes to ICT industry codes and publishes the data online. The data is annual-by-country, and it is based on the patents' priority dates.

Figures 5(a-c) show positive correlations between our openness score and patent applications filed with (a) the US Patent and Trademark Office, (b) the European Patent Office, and (c) the Patent Cooperation Treaty.





We next use a two-stage fixed effect panel regression to gauge whether the innovative activity by firms (R&D spending) yields innovative outputs, proxied by the data on patent applications. However, we must acknowledge an apples-and-oranges problem. The OECD has matched technology classes to the industry codes for the *comprehensive* ICT sector, while our data on R&D spending, firm size, firm and firm sales comes from firms in the *operational* ICT sector. We still test the relationship between R&D spending and subsequent patent applications, but the results should be interpreted with care.

In the first stage of our tests on patents, we regress the previous-period Business Enterprise R&D (*BERD*) on previous period *Openness* and controls. In the second stage, we regress patent application counts on the predicted values of *BERD*.³⁸

Columns (1) and (2) report the results of the regression with data on applications to the USPTO. The observations from the United States have been removed to eliminate home-country bias. However, the test based on applications to the EPO, reported in columns (3) and (4), do not eliminate European countries, because doing so would eliminate 5 of 12 countries from the dataset. Columns (5) and (6) report the results of tests based on PCT applications and the full set of 12 countries.

³⁸ We tested the general model with various lags. Additional regressions (not shown) applying three year lags to the model produced similar results, though regressions applying two year lags to the model did not. We currently lack a theoretical reason to apply lags of a certain period over lags of another. One future area of inquiry is to identify the lags most likely to reflect the true time between research decisions and patent applications.

TABLE 7: Dependent Variables – Logged Business Enterprise R&D (First Stage), and Logged Patent Applications (Second Stage)

VARIABLES	(1) Stage 1	(2) Stage 2	(3) Stage 1	(4) Stage 2	(5) Stage 1	(6) Stage 2
	Dep Var: (Log) L.BERD	Dep Var: (Log) PTO Applications	Dep Var: (Log) L.BERD	Dep Var: (Log) EPO Applications	Dep Var: (Log) L.BERD	Dep Var: (Log) PCT Applications
L.Open	1.618*** (0.428)		1.571*** (0.423)		1.250** (0.513)	
L.(Log) BERD		1.046** (0.452)		0.880 (0.794)		0.946* (0.573)
L. (Log) Employment	1.745** (0.743)	2.235** (1.100)	1.967** (0.527)	-1.031 (2.459)	1.759** (0.651)	-0.063 (1.607)
L. (Log) Gross Output	-0.450 (0.496)	1.013* (0.528)	-0.571 (0.527)	1.189 (1.110)	-0.486 (0.525)	0.875 (0.864)
L. (Log) GDP per capita	0.231 (0.657)	-1.189** (0.520)	0.253 (0.686)	-0.422 (0.984)	0.364 (0.690)	-0.793 (1.194)
L. (Log) Population	1.260 (2.077)	-4.960* (2.842)	1.098 (1.539)	-1.272 (2.807)	1.384 (1.349)	-0.744 (2.746)
Constant	-21.74 (34.22)	55.91 (47.95)	-19.07 (26.29)	13.07 (43.45)	-22.85 (23.49)	-0.259 (44.51)
Observations	123	123	137	137	146	146
Within Entity R ²	0.441	0.559	0.433	0.022	0.398	.
Country & Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In the first stage of all three tests, the coefficients on *Openness* and logged employment are positive and significant, as expected based on the subsection above. In the second stage, the coefficient on lagged *BERD* is significant for USPTO and PCT applications, but not for applications to the EPO. None of the control variables in the second stage of the regressions are significant.

The results suggest that a fairly strong association between the openness of copyright user rights and private sector R&D spending is linked to subsequent patenting activity. However, the results describing the link between R&D and patenting may be suspect because they combine data from a samples of firms based on the comprehensive and operational definitions of the ICT sector.

2. The Impact of Openness on Traditional Copyright Industries

We next test whether the gains to technology firms come at a cost to traditional copyright intensive industries. We use the PREDICT dataset's combined data on the “Media and Content” sector, defined according to the OECD definition.³⁹ It encompasses “Publishing of books, periodicals and

³⁹ <http://www.oecd.org/science/sci-tech/38217340.pdf>

TABLE 8: Dependent Variable - (Log) Gross Output

VARIABLES	(1)	(2)	(3)
Openness	0.796 (0.555)	0.554 (0.354)	-0.182 (0.111)
Openness*StrongCopyright	-0.593 (0.616)	-0.267 (0.434)	-0.0358 (0.244)
(Log) Employment		0.920* (0.414)	0.334* (0.180)
(Log) GDP per capita			0.793*** (0.071)
(Log) Population			0.220 (0.353)
Constant	8.573*** (0.432)	4.585** (1.835)	7.424 (6.192)
Observations	230	209	209
Within EntityR ²	0.147	0.216	0.817
Country & Time F.E.	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

other publishing activities (581), Audiovisual and broadcasting activities (59-60) and Other information service activities (639). It corresponds to the definition given by OECD in 2007.” PREDICT does not include data on gross output from the media and content sector in China. Nor does it include employment data for this sector in either China or India. Therefore, our results on media and content countries are based on data from a subset of the countries than our results on the ICT countries.⁴⁰

We run tests to see if there is a negative relationship between gross output (in constant euros) with our Openness Score. Again, we use employment to control for industry size, and we use GDP per capita and population to control for the wealth and size of the national market. We apply country and time fixed effects.

Column (1) one includes no controls other than the country and year fixed effects. We report this specification because it has the most complete dataset, with data from 11 countries. Column (2) adds logged employment to control variable for industry size, but the addition of this control comes at the cost of observations, including all observations from India. Column (3) adds controls for GDP per capita and population. None of the specifications indicate a significant negative relationship between openness. The coefficients on both *Openness* and *Openness*StrongCopyright* are all insignificant. However, one might reasonably point to the small sample sizes and reason that significant negative results could be yielded with larger samples – the analysis would benefit from a larger sample of countries. Controls for industry employment

⁴⁰ Regressions on BERD with the observations from India and China omitted yield similar results to those reported above, though they are not included in this working paper. The regression tables are available upon request

and national GDP per capita appear to be significant, though the control for population does not.

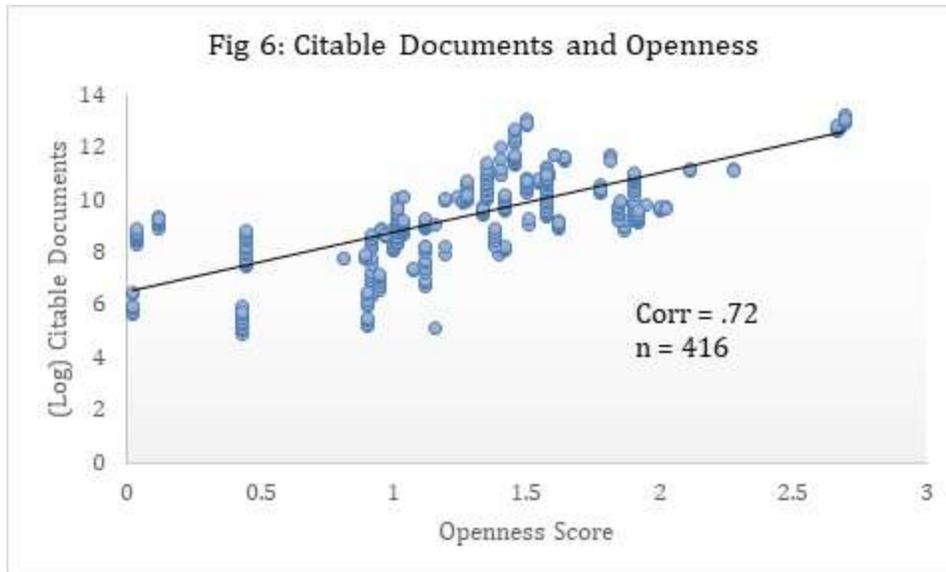
Finally, the low R-squareds in the first two specifications of the model indicate that most of the variation in the data is unaccounted for. The R-squared rises to 0.817 with the addition of logged GDP per capita as a control variable. For this sample of countries, market wealth seems to have had a much more important role in determining returns to the Media and Content industries than the copyright variables.

3. The Impact of Openness on Scholarship

Our last tests of copyright openness address the hypothesis that more open copyright user rights are associated with the creation of more and better new works. We focus on scholarly writing because of the clear relationship of scholarship to access to previous works, and find that more open copyright user rights are positively associated with the quantity scholarly production in these fields in our set of countries. However, there is also a negative, sometimes significant relationship between openness and proxies for quality of publications based on citations data.

Data on the number of citable documents produced annually by researchers in each country is taken from the SCImago Journal & Country Rank website, which aggregates citations data from the Scopus database. The Scopus database draws citation data from over 21,500 titles from more than 5,000 international publishers.⁴¹ The data gives us publication counts and citations data for all countries in our dataset except for Botswana from 1996 through 2015. (It has data from Botswana from 2000 through 2015.) Figure 6 shows the positive relationship between our openness score and the logged number of citable documents produced by scholars in each of the 21 countries in the User Rights Database.

⁴¹ The citable documents, data, and other citations data including the H index, is available for download from SCImago at <http://www.scimagojr.com>.



We test the relationship with controls for GDP per capita and population, the interaction term capturing the openness score in countries with stronger copyrights, and GDP per capita and population data from the World Bank website. We add specifications with lags on both copyright variables in order to account for the time between the research and writing of a paper and its publication. As before, we include fixed effects for country and year. Table 9 reports the results. The first column reports results before lagged values of the openness score and the interaction terms are added. Columns (2) through (5) report the results of specifications with lags.

The coefficients on *Openness* are positive and significant in all specifications, and the coefficients on *Openness*StrongCopyright* are positive and significant in all but one. Lagged coefficients on *Openness* become significant when the lag is three or four periods, though not earlier, and further F tests (not shown) confirm they are jointly significant. None of the coefficients on the interaction term are significant. Control variables behave as expected. In all, the results suggest a positive association between openness and the quantity of scholarly works produced, which is more pronounced in countries with stronger copyright laws. There is some evidence to suggest a lag between the effect of openness (when writers would be doing early research) and subsequent publications, though the significant lags are long.

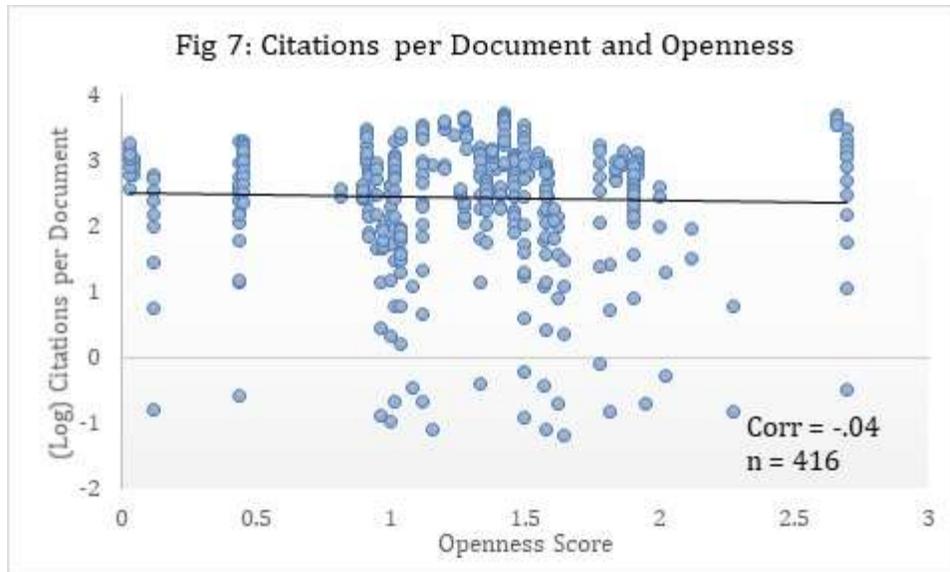
Table 9: Dependent Variable – (Log) Citable Documents

VARIABLES	(1)	(2)	(3)	(4)	(5)
Openness	0.218*	0.148**	0.158**	0.163**	.0162**
	(0.124)	(0.065)	(0.0613)	(0.061)	(0.064)
L.Openness		0.101	-0.010	-0.011	0.001
		(0.130)	(0.030)	(0.030)	(0.021)
L2.Openness			0.136	-0.067	-0.062
			(0.150)	(0.056)	(0.055)
L3.Openness				0.261**	0.119***
				(0.100)	(0.038)
L4.Openness					0.192**
					(0.080)
Openness*StrongCopyright	0.216	0.345*	0.303**	0.253**	0.223***
	(0.428)	(0.166)	(0.123)	(0.103)	(0.077)
L.Openness*StrongCopyright		-0.152	-0.007	-0.038	-0.075
		(0.355)	(0.124)	(0.086)	(0.081)
L2.Openness*StrongCopyright			-0.100	0.141	0.079
			(0.473)	(0.161)	(0.131)
L3.Openness*StrongCopyright				-0.146	-0.130
				(0.428)	(0.164)
L4.Openness*StrongCopyright					0.130
					(0.375)
(Log) GDP per capita	1.652***	1.657***	1.692***	1.753***	1.77***
	(0.173)	(0.178)	(0.185)	(0.195)	(0.206)
(Log) Population	3.090***	3.069***	2.928***	2.588**	2.325*
	(0.892)	(0.961)	(1.020)	(1.085)	(1.189)
Constant	-60.69***	-60.39***	-58.28***	-52.99***	-48.65**
	(15.11)	(16.29)	(17.30)	(18.38)	(20.09)
Observations	396	376	356	336	316
Within Entity R ²	0.846	0.842	0.838	0.833	0.824
Country & Time F.E.	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

While the number of citable documents published by a country is an indicator of the quantity of scholarly output, it does not address the quality. To measure the relationship between openness and the quality of scholarly output, we turn to two citations-based measures: citations per document and the “H-index.” Both are available from the SCImago website. Figure 7 shows the weakly negative relationship between citations per document and openness.



Again, we test the relationship through a series of regressions that include control variables for GDP per capita and population as well as lagged variables. The results, presented in Table 10, show a significant negative relationship between the *Openness* and logged citations per document when *Openness* is lagged two or three periods. Joint F tests of the lagged variables indicate joint significance as well. When a fourth-period lag is added to the model, none of the coefficients on *Openness*, whether lagged or unlagged, are significant.

Table 10: Dependent Variable – (Log) Citations Per Document

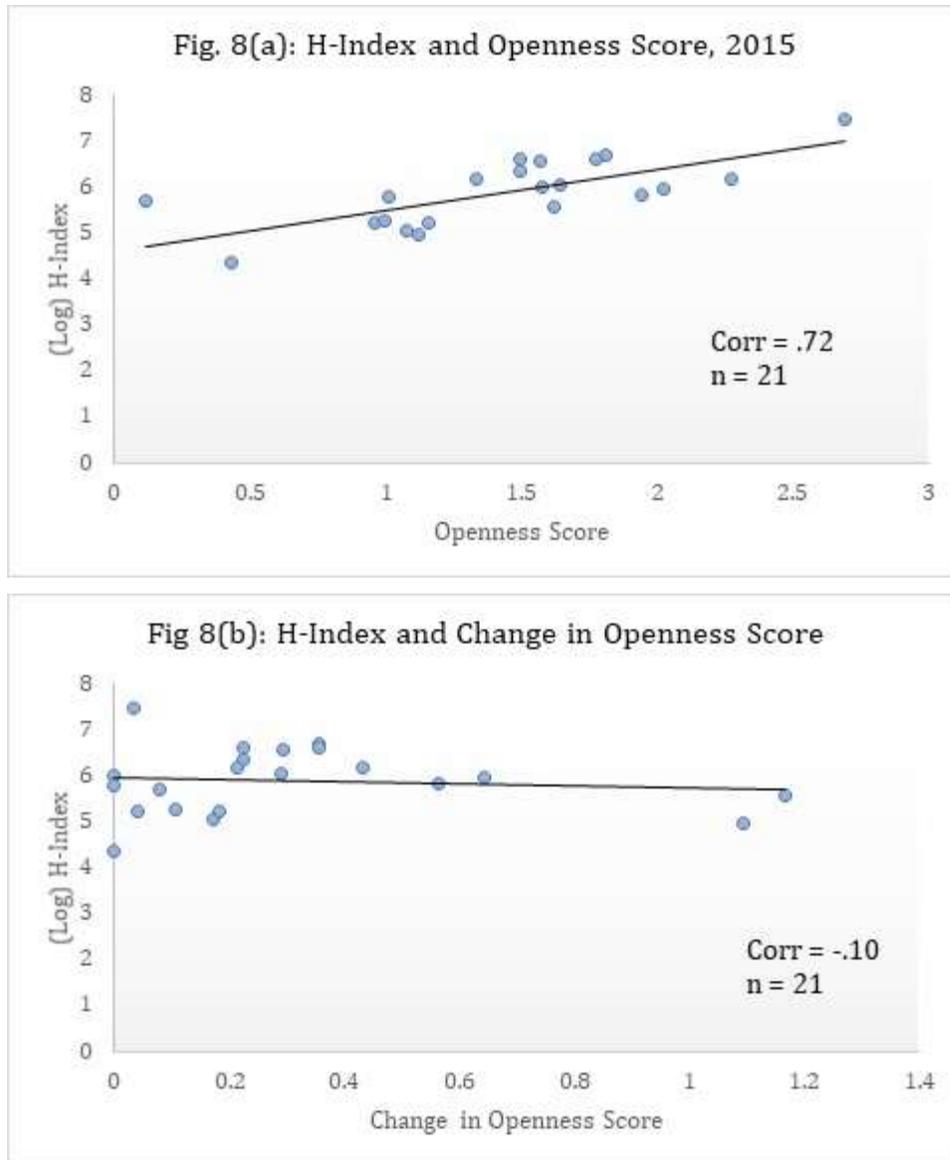
VARIABLES	(1)	(2)	(3)	(4)	(5)
Openness	-0.357 (0.355)	0.007 (0.292)	-0.044 (0.271)	-0.086 (0.257)	-0.095 (0.251)
L.Openness		-0.423* (0.203)	0.111 (0.172)	0.123 (0.175)	0.090 (0.172)
L2.Openness			-0.607*** (0.165)	-0.077 (0.109)	-0.061 (0.111)
L3.Openness				-0.624*** (0.250)	-0.404 (0.269)
L4.Openness					-0.281 (0.281)
Openness*StrongCopyright	-0.747 (0.947)	-0.511 (0.582)	-0.785 (0.589)	-0.591 (0.654)	-0.618 (0.634)
L.Openness*StrongCopyright		-0.288 (0.700)	-0.318 (0.533)	-0.671 (0.629)	-0.396 (0.673)
L2.Openness*StrongCopyright			0.291 (0.932)	0.268 (0.523)	-0.079 (0.516)
L3.Openness*StrongCopyright				0.180 (1.151)	0.833 (0.726)
L4.Openness*StrongCopyright					-0.756 (1.135)
(Log) GDP per capita	-1.017*** (0.340)	-1.101*** (0.362)	-1.187*** (0.377)	-1.336*** (0.422)	-1.465*** (0.501)
(Log) Population	-5.266*** (1.489)	-5.820*** (1.746)	-6.327*** (1.968)	-6.729*** (2.333)	-7.029*** (2.802)
Constant	105.4*** (23.93)	116.0*** (28.12)	125.9*** (31.74)	134.6*** (37.54)	141.3*** (44.98)
Observations	396	376	356	336	316
Within Entity R ²	0.411	0.435	0.459	0.475	4.84
Country & Time F.E.	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The interaction term *Openness*Strong Copyright* is insignificant across all specifications, both lagged and unlagged. The control variables are significant and negative, indicating that countries in this dataset tended to produce less-cited papers as they grew larger and wealthier, even after controlling for year fixed effects. The results are unexpected, but could indicate that scholars in countries that are beginning to publish on a greater scale are not yet as heavily cited as scholars from countries that have published extensively for longer periods of time.

A preferred metric to measure the quality of publications is the H-index. At the national level, the H index is defined as the highest number of papers “h” published by researchers in a given nation that have been cited at least h times. The metric was designed specifically to capture both the quantity and



importance of a country's scholarly output, and is available from SCImago. However, SCImago's data on the H-index is cumulative for the 1996-2015 periods, so annual observations are impossible. Nevertheless, we show two raw correlations. Figure 8(a) shows a positive relationship between the H-index and the openness score using the 2015 value of all variables. It provides some support for the hypothesis that scholars in countries with higher levels of openness publish higher quality scholarly works. However, Figure 8(b) shows a negative relationship between the H index and the change in countries' openness score between 2000 and 2015, undercutting that hypothesis.⁴² Regressions on the tiny samples yield unsurprisingly

⁴² The year 2000 is chosen as the first year, because it is the first year for which we have data from all countries. For 1996-1999, we lack data from Botswana.

insignificant results, and they are not shown in this paper.

In sum, greater openness in copyright user rights has been associated with a higher volume of scholarly works in our sample of countries. The association between openness and the quality of scholarly output is more mixed. Countries with greater openness in copyright user rights law seem to produce more highly-cited papers, but the number of citations per document and highly cited papers has declined as laws have become more open.

V. CONCLUSION

This paper has presented a new open access resource for researchers seeking to test the impact of user rights on society – the User Rights Database. It is a tool for identifying and measuring change in nations’ laws protecting copyright user rights. Though the test described above focus on an Openness Score derived from the data, one can slice the information in Database in different ways to focus on different aspects of the law. For instance, one could examine survey data that is particularly relevant to educators or libraries. There are many ways to use the data to test the impact of legal changes on people and firms.

Our tests using the Openness Score from the Database indicate that greater openness in copyright user rights has been associated with positive outcomes in our samples of countries. Firms in the ICT industries invested more in research and development when their home countries had more open copyright user rights. Greater R&D by businesses was followed by an increase in patent applications. On average media and content industries in the same countries did not seem to suffer adverse consequences as the copyright laws became more open. We also find that scholars in countries with more open user rights environments publish more papers, though evidence suggests a negative relationship between openness and the quality of publications, as measured by citations.

The Copyright User Rights Database is still a work in progress. In the coming year we hope to expand it to include data from approximately 20 more countries. To further our analysis of copyright issues utilizing the Database, we will develop more complete models (including dynamic panel models) that capture other determinants of innovative activities and creative outputs, such as public sector research funding. Finally, we plan to use the data to identify shocks to copyright law that present opportunities for natural experiments. It is our hope that other researchers will make use of the Database as well.