



# Economics of Global Copyright Policies: Impacts on U.S. Multinational Investments

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December 2015

The statistical analysis of firm level data on U.S. multinational companies and their foreign affiliates was conducted at the Bureau of Economic Analysis, United States Department of Commerce, under arrangements that maintain legal confidentiality requirements. Views expressed in this paper are those of the author and do not necessarily reflect the official positions of the US Department of Commerce.

# Copyrights & Economic Development

## ▶ WHY? HOW?

- ▶ Art Works, Films, Books, Sound Recordings contribute to the stock of knowledge
- ▶ Software, Databases, Journals used in scientific research, R&D
- ▶ Copyright-Based Industries account for a significant share of GDP, trade, employment
  - ▶ Cf. World Intellectual Property Office (WIPO) studies on the contribution of copyright-based industries
  - ▶ Caution: Non-causal analyses
- ▶ Market Size Effects (Demand Spillovers)
  - ▶ *Expansion of Copyright Industries provides incentives for firms in complementary industries to develop or invest in inputs and products related to the production or consumption of creative works.*

# Copyrights in Brief

- ▶ Protect Creative works
- ▶ Protect Expression, not Ideas
  - ▶ Based on originality (not Novelty)
- ▶ By default
  - ▶ To waive specific rights, go to *Creative Commons*
- ▶ Registration is not mandatory
- ▶ Big Issues: Piracy (relative ease), Access (fair use), and Rent-seeking

# State of Research

- ▶ Basic Theory:
  - ▶ Stronger copyright protection and enforcement increases cost of reproduction, reduces imitation, increases return to rights holder, and generates incentives for creation and product launches
  - ▶ But increases costs of access and creates transactions costs (burden of clearing rights and/or working around existing rights, especially if limited modes of expression exist)
- ▶ Empirical Evidence (few)
  - ▶ Single country (US or Canada)
  - ▶ Single product (books, music (operas), film)
  - ▶ Piracy, File-sharing studies find crowding out is not 1:1
  - ▶ Limited investigations beyond copyright industry
    - ▶ *Pamela Smith et al. (2009) study effect on relevant Infrastructure*
    - ▶ *Lerner (2011) studies effect on cloud computing*

# State of Research

- ▶ Copyright Systems are founded upon a balance:

Rights



Exceptions

- ▶ Most studies are skewed towards research on “Rights”
- ▶ Exceptions refer to ability to copy or use copyrighted works without permission (e.g., format-shifting, time-shifting, data mining)
- ▶ Background: Fair Use vs. Fair Dealing
  - ▶ U.S. style fair use provides broad principles for adjudicating
  - ▶ E.U. style fair dealing provides an enumerated list of exceptions
  - ▶ TRIPS Article 13 requires national laws to meet the Berne “Three-Step” test

# Limitations & Exceptions (L&E) Issues

## ▶ Transactions Costs

- ▶ i.e., market failure if costs of negotiation, licensing, search, monitoring, and obtaining permission > value of trade

## ▶ Economic Benefits & Costs

- ▶ L&E may enhance the value of the creative work, inspire new uses, spur transformative works, reduce the cost of creative activity, and alleviate market power
- ▶ Or displace sales of copyright owner, create confusion with original work, and reduce incentives for future creativity

## ▶ Policy Front:

### ▶ Three-Step Test

- ▶ Exceptions must be confined to special cases
- ▶ Not interfere with the normal exploitation of the work
- ▶ Not unreasonably prejudice the legitimate interests of the rights holder

### ▶ Intermediary Liability

### ▶ Safe Harbor

### ▶ Voluntary Initiatives

- ▶ Notice & Take down

# GAPS

- ▶ Need to understand better how copyright protection and user rights (such as limitations & exceptions) interact to affect creativity and the diffusion of works
- ▶ Need to broaden the scope of the potential impact of copyright systems beyond the traditional copyright sector (such as incentives for investment in complementary industries).
- ▶ This current study explores U.S. multinational firm data
  - ▶ U.S. companies are the leading holders of copyrighted works
  - ▶ Markets for creative works have expanded across the world
  - ▶ Copyright reforms, including standards for L&E, have occurred under international agreements and are coordinated inter-governmentally
  - ▶ Intellectual property concerns arise especially in developing countries (USTR)
  - ▶ Access to creative works is important for global economic development

# Nature of Dataset

- ▶ 1,223 U.S. Parent Firms
- ▶ Each has at least one or more affiliates in the
  - ▶ North (23 Developed countries) 69% of sample
  - ▶ South (65 Developing Countries) 31%
- ▶ 3 Main Industries
  - ▶ Copyright-related (Information) 24% of sample
  - ▶ Complementary (High-technology) 60%
  - ▶ Professional & Scientific Services 16%
- ▶ Annual Data: 1989 – 2011
- ▶ Source: U.S. Bureau of Economic Analysis, Annual Surveys of USDIA and Transactions in Services ...

# Industry Coverage (by NAICS codes)



## Copyright-related Industries

5111 Newspaper, periodicals, books, and directories  
5112 Software publishers  
5121 Motion picture and video industries  
5122 Sound recording industries  
5151 Radio and television broadcasting  
5152 Cable and other subscription programming  
5161 Internet publishing and broadcasting  
5171 Wired telecommunications carriers  
5172 Wireless telecommunications (excluding satellite)  
5174 Satellite telecommunications  
5181 Internet Service Providers, Web Search Portals  
5182 Data processing  
5191 Other Information Services  
7110 Performing Arts, spectator sports, and related  
7121 Museums, historical sites, and similar institutions

## Complementary Industries

3231 Printing and related support activities  
3341 Computer and peripheral equipment  
3342 Communications equipment  
3343 Audio and video equipment  
3344 Semiconductors, other electronic components  
3345 Navigational, measuring, control instruments  
3346 Making, reproducing magnetic/optical media  
3351 Electric lighting equipment  
3353 Electrical equipment  
3359 Other electrical equipment and components

## Professional and Scientific Services Industries

5415 Computer systems design and related services  
5416 Management, scientific, technical consulting  
5417 Scientific research and development  
5419 Other professional, scientific, technical services

# Distribution of U.S. Licensing by Type of Work and by Sector



COPYRIGHT-RELATED INDUSTRIES				Unaffiliated Licensing				
	Indus Proc	Books etc	Tmark	Films	Broad	Soft	Fran	Other
South	0.9%	1.0%	6.8%	32.6%	2.3%	56.2%	0.1%	0.1%
North	2.0%	2.2%	8.7%	39.9%	1.3%	45.9%	0.0%	0.1%
COMPLEMENTARY INDUSTRIES				Unaffiliated Licensing				
	Indus Proc	Books etc	Tmark	Films	Broad	Soft	Fran	Other
South	88.4%	0.4%	0.4%	8.5%	0.0%	2.3%	0.0%	0.0%
North	71.2%	0.2%	1.2%	19.8%	0.0%	7.6%	0.0%	0.1%
Ratio of Means (Copyright to Complementary)	0.06	21.38	23.65	6.29	>1000	21.20	7.91	5.80

# Distribution of U.S. Technology Transfer Across Sectors

Distribution of U.S. Unaffiliated Licensing, within-sector		NORTH Licensing Receipts	SOUTH Licensing Receipts
Naics	Copyright-related		
5111	Newspaper, periodical, book, and database publishers	2.71%	2.58%
5112	Software publishers	6.59%	9.14%
5121	Motion picture and video industries	86.03%	82.06%
5122	Sound recording industries	0.01%	0.07%
5151	Radio and television broadcasting	3.94%	3.03%
5152	Cable networks and program distribution	0.71%	3.11%
Naics	Complementary Industries	"	"
3231	Printing and related support activities	0.27%	0.27%
3341	Computer and peripheral equipment manufacturing	22.00%	24.88%
3342	Communications equipment manufacturing	73.59%	69.00%
3344	Semiconductors and other electronic components manufacturing	3.27%	5.70%
3345	Navigational, measuring, electromedical, and control instruments manufacturing	0.36%	0.09%
3346	Manufacturing and reproducing magnetic and optical media	0.16%	0.07%
3359	Other Electrical Equip	0.34%	0.00%
		North	South
Ratio of Licensing Means (Copyright to Complementary Industries)		1.05	0.34
		Copyright	Complem.
Ratio of Licensing Means (South to North)		0.18	0.57

# Distribution of U.S. Technology Transfer Across Sectors

Distribution of U.S. Foreign Direct Investment, within-sector		NORTH:	SOUTH:
Naics	Copyright-related	FDI Stock	FDI Stock
5111	Newspaper, periodical, book, and database publishers	32.8%	41.5%
5112	Software publishers	15.3%	9.5%
5121	Motion picture and video industries	41.7%	45.0%
5122	Sound recording industries	4.2%	2.1%
5152	Cable networks and program distribution	0.8%	0.0%
5172	Wireless telecommunications carriers, non satellite	0.1%	0.2%
5181	Internet Service Providers and Web search portals	1.7%	0.0%
5182	Data Processing, hosting, and related services	0.2%	0.0%
5191	Other Information Services	3.2%	1.8%
Naics	Complementary Industries	"	"
3231	Printing and related support activities	4.7%	1.8%
3341	Computer and peripheral equipment manufacturing	31.4%	24.8%
3342	Communications equipment manufacturing	18.7%	27.9%
3343	Audio and video equipment manufacturing	0.0%	0.3%
3344	Semiconductors and other electronic components manufacturing	37.2%	42.6%
3345	Navigational, measuring, electromedical, and control instruments manufacturing	5.6%	0.5%
3351	Electric lighting equipment manufacturing	0.5%	0.1%
3353	Electrical equipment manufacturing	0.0%	0.0%
3359	Other Electrical Equip	2.0%	2.0%
		North	South
Ratio of FDI Means (Copyright to Complementary Industries)		0.44	0.21
		Copyright	Complem.
Ratio of FDI Means (South to North)		0.31	0.67

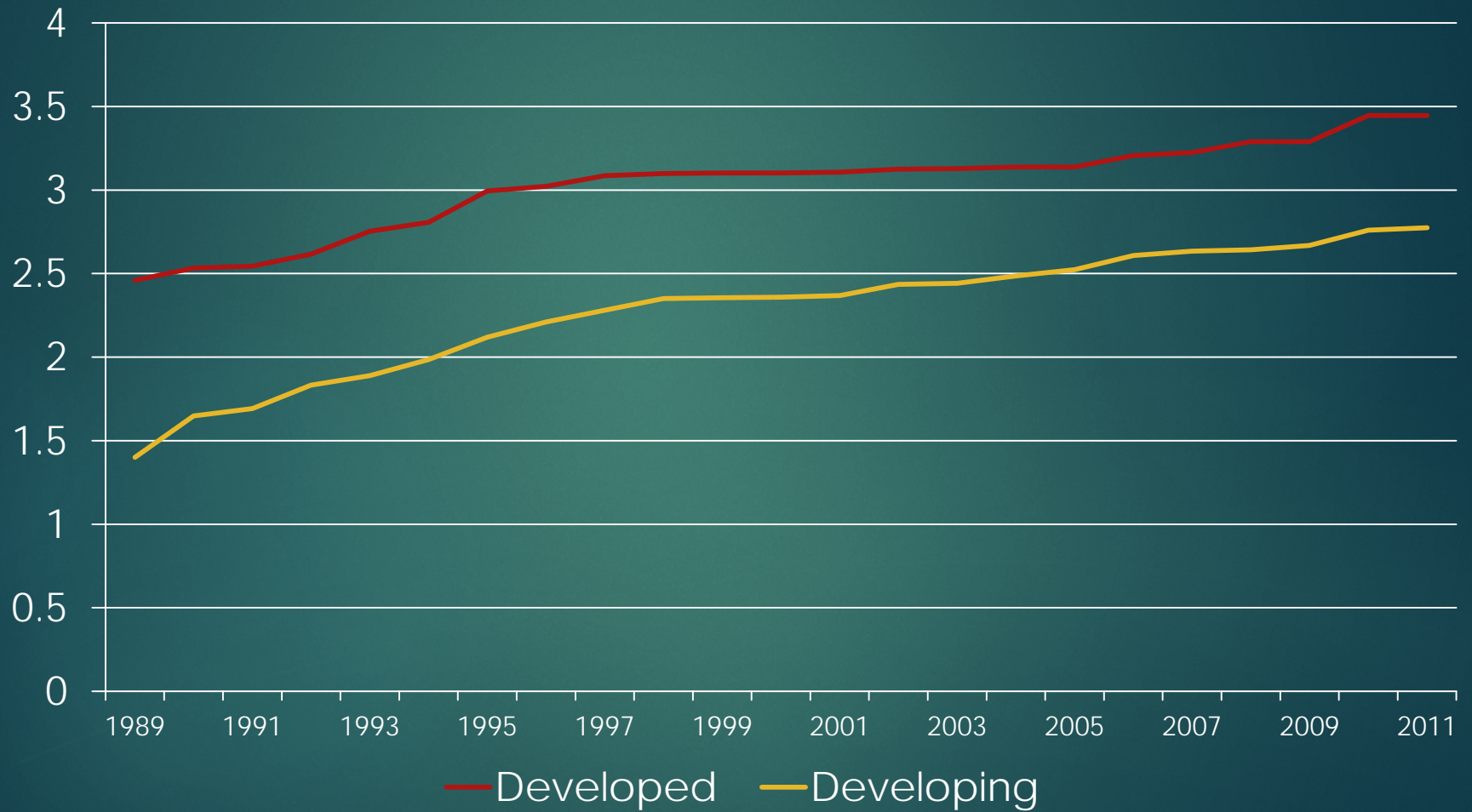
# Objectives of Analysis:

- ▶ How dependent are U.S. copyright firms' FDI and international licensing on **copyright regimes** abroad?
- ▶ Do expansions in foreign copyright **markets** influence investments by firms in the complementary industries?
- ▶ How do copyright protections and **limitations and exceptions** (L&E) interact?

# Index of Copyright Protection

- ▶ Park (2005) and Reynolds (2003), updated
- ▶ Index covers 120 countries from 1965 – 2013 (annually, where available).
- ▶ Four Components (measuring strength of protection)
  - ▶ Duration (Copyrights and Related Rights)
  - ▶ Usage (Private Use, Collective Licensing)
  - ▶ Enforcement (Injunction, Criminal Penalties, Anti-circumvention)
  - ▶ International Agreements/Treaties/Conventions
- ▶ Overall Index varies from 0 – 4.
- ▶ Source of Information: Statutes, Case Laws, and Commentaries

# ... Trends



# I. Copyrights and U.S. Tech Transfer

Dependent Variable: Unaffiliated Licensing				
	North	North	South	South
Copyright index	0.736	0.483	0.323	0.147
Copyright index x M		0.613***		0.382***
Observations	4931	4931	6694	6694
M: dummy variable = {0, 1} for Below/Above Median Industry Sale Rank in the U.S. market (proxy for sensitivity to copyright protection)				

Sample: U.S. Parent Firms in the Copyright Industry, 1992 - 2011

Control Variables: Destination GDP, Capital per worker, Indexes of Free Trade, Inward Capital Restrictions, Quality of Legal Regime, Property Rights, and Income tax rate.

Other: Firm Fixed Effects, Country Fixed Effects, Host-country specific time trends.

Standard errors are robust and clustered by country x year (and are omitted to conserve space. Variables are **logged**, unless Indicated otherwise.

\*\*\*, \*\*, \* indicate p-values of 0.01, 0.05, and 0.10 respectively.

# I. Copyrights and U.S. Tech Transfer

Dependent Variable: FDI Stock				
	North	North	South	South
Copyright index	1.405**	1.408**	2.097***	2.153***
Copyright index x M		-0.007		-0.120
Observations	12387	12387	6389	6389
M: dummy variable = {0, 1} for Below/Above Median Industry Sale Rank in the U.S. market (proxy for sensitivity to copyright protection)				

Sample: U.S. Parent Firms in the Copyright Industry, 1992 - 2011

Control Variables: Destination GDP, Capital per worker, Indexes of Free Trade, Inward Capital Restrictions, Quality of Legal Regime, Property Rights, and Income tax rate.

Other: Firm Fixed Effects, Country Fixed Effects, Host-country specific time trends.

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\*\*\*, \*\*, \* indicate p-values of 0.01, 0.05, and 0.10 respectively.

# I. Copyrights and U.S. Tech Transfer

## Dependent Variable: Unaffiliated Licensing by Type of Work

	Books etc.		Films		Broadcasting		Software	
	North	South	North	South	North	South	North	South
Copyright index	-0.726	0.382**	0.034	0.260	0.320	0.352**	0.437	-0.244
Copyright index x M	0.733***	0.332***	0.173***	0.152***	0.029	-0.003	0.024	0.004
Observations	4931	6694	4931	6694	4931	6694	4931	6694

M: dummy variable = {0, 1} for Below/Above Median Industry Sale Rank in the U.S. market (proxy for sensitivity to copyright protection)

Sample: U.S. Parent Firms in the Copyright Industry, 1992 - 2011

Control Variables: Destination GDP, Capital per worker, Indexes of Free Trade, Inward Capital Restrictions, Quality of Legal Regime, Property Rights, and Income tax rate.

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Standard errors are robust and clustered by country x year (and are omitted to conserve space). Variables are **logged**, unless Indicated otherwise.

\*\*\*, \*\*, \* indicate p-values of 0.01, 0.05, and 0.10 respectively.

## II. Market Size and Complementary Industries

### ► Inter-sectoral Linkages:

- U.S. Parent companies in the 'complementary' industries have affiliates abroad operating not only in the complementary industries, but also in other industries, including copyright. And *vice versa* (parent firms in copyright industries have affiliate firms in non-copyright industries).

### ► First look:

Ratio: Post-Copyright Reform Episode to Pre-Copyright Reform		
Affiliates in:	FDI by Parent Firm in Complementary Industries	Affiliates SALES of Parent Firm in Complementary Industries
Complementary Industries	4.53	4.39
Copyright-related Industries	2.50	5.79
Professional & Scientific Industries	3.92	5.81

## II. Market Size and Complementary Industries

### NORTH

Dep Variable	Unaffiliated Licensing	FDI Stock	Affiliate R&D	Affiliate Capital Stock	Affiliate Sales
Market Size	-0.215	0.351**	-0.142**	-0.071	-0.025
Market Size x W	-0.971	0.092***	0.230***	0.274***	0.200***
Observations	1197	30981	11858	11863	11863

Market = Sales of firms in the copyright-related industries in the Host country (source: Thomson Datastream Worldscope)  
W: weight, the share of the firm's value added in a country to the firm's global value added in each year

Sample: U.S. Parent Firms in the Complementary Industry, 1992 - 2011

Control Variables: Destination GDP, Capital per worker, Indexes of Free Trade, Inward Capital Restrictions, Quality of Legal Regime, Property Rights, and Income tax rate.

Other: Firm Fixed Effects, Country Fixed Effects, Host-country specific time trends.

Standard errors are robust and clustered by country x year (and are omitted to conserve space). Variables are **logged**, unless indicated otherwise.

\*\*\*, \*\*, \* indicate p-values of 0.01, 0.05, and 0.10 respectively.

## II. Market Size and Complementary Industries

### SOUTH

Dep Variable	Unaffiliated Licensing	FDI Stock	Affiliate R&D	Affiliate Capital Stock	Affiliate Sales
Market Size	-0.154	-0.126**	0.157***	0.057	0.013
Market Size x W	0.151	0.250***	0.109***	0.336	0.249
Observations	454	12825	5858	5856	5858

Market = Sales of firms in the copyright-related industries in the Host country (source: Thomson Datastream Worldscape)  
W: weight, the share of the firm's value added in a country to the firm's global value added in each year

Sample: U.S. Parent Firms in the Complementary Industry, 1992 - 2011

Control Variables: Destination GDP, Capital per worker, Indexes of Free Trade, Inward Capital Restrictions, Quality of Legal Regime, Property Rights, and Income tax rate.

Other: Firm Fixed Effects, Country Fixed Effects, Host-country specific time trends.

Standard errors are robust and clustered by country x year (and are omitted to conserve space. Variables are **logged**, unless indicated otherwise.

\*\*\*, \*\*, \* indicate p-values of 0.01, 0.05, and 0.10 respectively.

### III. Role of Limitations & Exceptions

- ▶ First look: Consider AFFILIATE SALES under four regimes (above/below median copyright strength; with/without codification of L&E standards)

North	Three-step Test: No	Three-step Test: Yes	Safe Harbor: No	Safe Harbor: Yes	Intermediary Liability: No	Intermediary Liability: Yes
Below Median Copyright	1*	0.40	1	8.81	1	0.43
Above Median Copyright	1.95	0.54	24.7	17.4	1.10	1.4

\* Normalized to this "case"

Note: using the sample of firms in the copyright-related industries

### III. Role of Limitations & Exceptions

- ▶ Repeat for Affiliate Sales in Developing Countries

South	Three-step Test: No	Three-step Test: Yes	Safe Harbor: No	Safe Harbor: Yes	Intermediary Liability: No	Intermediary Liability: Yes
Below Median Copyright	1*	0.51	1	1.24	1	0.48
Above Median Copyright	5.58	0.73	3.88	8.39	1.78	3.10

\* Normalized to this "case"

Note: using the sample of firms in the copyright-related industries

### III. Role of Limitations & Exceptions

Dep. Variable	FDI Stock	FDI Stock	Unaffiliated Licensing	Unaffiliated Licensing	Affiliate Sales	Affiliate Sales	Affiliate Capital Stock	Affiliate Capital Stock
Region	North	South	North	South	North	South	North	South
Copyright index	0.342	0.683*	-0.103	0.954***	1.629	-0.560	2.976***	-0.814
Copyright index x M	-0.017	-0.314**	0.582***	0.719***	-0.115	-0.815***	-0.285***	-0.708***
Step	1.211	0.052	0.434	1.144***	-0.735	1.539	2.856*	0.449
Step x Copyright index	-1.364	0.156	-0.704	-0.949***	-0.166	-1.424	-3.562**	-0.403
Step x Copyright index x M	0.257	0.130	-0.059	-0.174	-0.052	1.091***	0.076	1.115***

Sample: U.S. Parent Firms in the Copyright Industry, 1992 - 2011

Control Variables: Destination GDP, Capital per worker, Indexes of Free Trade, Inward Capital Restrictions, Quality of Legal Regime, Property Rights, and Income tax rate.

Other: Firm Fixed Effects, Country Fixed Effects, Host-country specific time trends.

Standard errors are robust and clustered by country x year (and are omitted to conserve space. Variables are **logged**, unless indicated otherwise. M = dummy variable {0,1} indicating relative copyright sensitivity (based on industry rank in U.S. market). STEP = {0, 1} indicating whether the 3-step is a general provision of copyright L&E. \*\*\*, \*\*, \* indicate p-values of 0.01, 0.05, and 0.10 respectively.

# Main Highlights

- ▶ Importance of copyright systems has expanded with increased global trade in information goods/services
- ▶ Copyright-related industries account for a significant share of U.S. international technology transfer
- ▶ Economic impacts of copyright systems go beyond the traditional copyright sector (e.g., complementary industries)
- ▶ The impacts depend upon the mixture of protections for copyright **owners** and limitations and exceptions for copyright **users**

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