UNITED STATES NAVAL ACADEMY
DEPARTMENT OF ECONOMICS
WORKING PAPER 2004-01

"COURT DECISIONS AND EQUITY MARKETS: ESTIMATING THE VALUE OF COPYRIGHT PROTECTION"

by

Matthew J. Baker
Department of Economics
United States Naval Academy

And

Brendan M. Cunningham
Department of Economics
United States Naval Academy

Court Decisions and Equity Markets: Estimating the Value of Copyright Protection

Matthew J. Baker and Brendan M. Cunningham

U. S. Naval Academy

Original Version: October 31, 2003
This Version: January 11, 2004

ABSTRACT

We use a novel database on U. S. federal court decisions to measure the changes in the state of copyright protection in both statute and case law. We combine an index of copyright breadth derived from this database with a quarterly panel of firms in creative industries over the years 1986-1998. Using this data, we measure the impact of changes in the breadth of copyright on the market valuation of firm equity. We maintain the assumption that equity markets will incorporate the value of copyright innovations into the price of equity. After controlling for a variety of fundamental determinants of firm-level excess returns to equity, we find that a court case broadening copyright is associated with a statistically significant 23-45 basis points increase in a firm's excess return. Our results obtain across both 4-5 year sub-samples and the size distribution of firms.

Keywords: Copyright, Asset Pricing, Intellectual Property, Law.
JEL Classification: C23, G12, K0, L82, O34, Z1.

PRELIMINARY DRAFT

*Address: Department of Economics, U. S. Naval Academy, 589 McNair Road, Annapolis, MD, 21402. This research was funded by a Naval Academy Research Council Grant.

1 Introduction

Creative and intellectual expression has long been afforded unique legal consideration in the United States. The centrality of copyright in U. S. federal law is easily established by its explicit inclusion in the original United States constitution. Copyright is even more deep-rooted in Europe; 1469 witnessed perhaps the earliest extension of intellectual property protection when the Republic of Venice began issuing exclusive rights to the publication of books.[1]

While it is certainly important to protect intellectual property, the degree of protection is a subject of some debate. In the U. S., a series of congressional acts have continually increased the length of copyright. The original Copyright Act of 1790, modelled on the English Statute of Anne, granted authors copyright protection for 14 years with a renewal period of 14 years.[2] In 1831, the initial term was extended to 28 years, and in 1909 the renewal period was also extended to 28 years. In 1976, the initial term was extended to 50 years (75 for joint works), in 1992 copyright renewal became automatic, and most recently in 1998, the Sonny Bono Copyright Term Extension Act established protection for the life of the author plus an additional 75 years. Congress has also passed acts which extend copyright protection to more modern forms of expression. In 1990, copyright law first prohibited commercial lending of software, while the Database Investment and Intellectual Property Anti-Piracy Act of 1996 offered increased protection to computer databases. In the past 20 years, the Berne Convention and the Uruguay Round Agreements have also served to coordinate U. S. copyright protection with international principals.[3, 4]

Recent changes in copyright law have caused some to wonder if protection has not become

[1] Khan (2001) provides a detailed description of the entire international history of copyright. Plant (1934) and Khan and Sokoloff (2001) provide a thorough discussion of the origins of British and American copyright, respectively.

[2] The statute was entitled "An Act for the Encouragement of Learning, by Securing the Copies of Maps, Charts, and Books to the Authors and Proprietors of Such Copies."

[3] The agreement was in fact part of GATT, which included a proviso called "Trade Related Aspects of Intellectual Property" (TRIPs).

[4] This information is summarized by the "Copyright Timeline" available at `http://www.arl.org/info/frn/copy/timeline.html`.

overly broad. A New York Times editorial, in response to the Supreme Court's decision upholding Congress' extension of copyright protection, claimed that "the court's decision may make constitutional sense, but it does not serve the public well."[5] This sentiment was widely echoed and prominent legal scholars have openly wondered whether or not the congressional and judicial extension of copyright has gone too far.[6]

The problem with repeated broadening of copyright protection is that it creates monopoly power. Ideally, the optimal breadth of copyright should balance incentives for creative expression with the welfare losses associated with monopoly. [7]

Rather than actually measuring the value of changes in copyright protection, most empirical work on copyright protection has focused on the relationship between infringement and protection. For example, Harbaugh and Khemka (2000) ask whether or not copyright protection increases piracy while Kranenberg and Hogenbrink (2003) study some of the international determinants of piracy. Chiang and Assane (2002) study software piracy among college students. Other work has attempted to more directly the incentive effects of changes in copyright protection. Towse (1999), Khan (2001), and Hui and Png (2002) assess, respectively, the impact of variations in copyright statutes on musician royalties, book publishers' returns, and movie industry output. Generally speaking, these studies have found that changes in copyright protection have had little impact on industry output; this is not surprising, however, given 1) incentive effects can only be fully displayed after a considerable time, and 2) the ambiguous predictions of theoretical models such as Landes and Posner (1989) concerning the response of copyright output and increased protection.

[5] See Anonymous (2003)

[6] See, for example, Epstein (1998) and Lessig and Samuelson (1998).

[7] The social costs and benefits of copyright protection are discussed in Landes and Posner (1989); see also Miceli and Adelstein (2003). Johnson (1985) considers the dynamic aspect of consumer welfare in the presence of copyright. However, Novos and Waldman (1984) claim that, from a theoretical perspective, any second-best welfare costs associated with copyright are not significant. In addition, Klein, Lerner and Murphy (2002) note that since copyright only extends exclusivity to the expression of an idea, and not to an idea itself, authors are granted something short of complete monopoly (for more on the distinction between protection of innovations and expressions, see Besen and Raskind (1991)).

Rather than trying to measure the impact of incentive effects in changing copyright law, or infer them indirectly from data on infringement rates, we attempt instead to measure the *discounted present value* of expanded copyright protection. We also develop a measure of copyright breadth which allows for higher-frequency change in the nature of copyright protection: we consider existing state of copyright as defined by both statute and case law. Over almost any period of time, court decisions will alter the practical boundaries of copyright protection far more frequently than statutory changes, thereby providing a richer background against which one can test for a range of possible effects of copyright on incentives. In order to conduct this exercise, we quantify the overall breadth of copyright via a novel case law index formed by cataloguing those U. S. federal court decisions which broaden and narrow copyright over the years 1986-98.

In order to avoid the second pitfall of empirical analysis (unknown lags in the economic impact of legal innovations), we rely upon the forward-looking nature of equity markets. Our maintained assumption is that, for publicly-traded firms that primarily rely upon creative intellectual property, the net present discounted value of a change in the nature of copyright protection will be incorporated into the current price of equity. This re-pricing of equity should follow close on the heels of legal innovations, regardless of delays in their transmission to the return on copyrightable works. To control for the non-legal determinants of equity valuation, we estimate a standard quarterly fundamentals-based model of returns to equity in excess of the risk-free rate. After applying this approach to a panel of firms, we find that one federal court case broadening copyright protection, all else equal, is associated with a statistically significant increase in the excess return to equity of 22-45 basis points, or approximately $4 million - $8.4 million for a given firm.[8] In keeping with prior research, we fail to obtain a statistically significant response of excess returns to variations in copyright statutes. Given that courts are the ultimate arbiters of intellectual property protections

[8]The monetary value of this estimate is measured in 1998 dollars. The value is obtained by taking the product of the relevant coefficients and the average market value of equity for the firms in our sample in 1998:Q4 ($1.86 billion).

in practice, and that future decisions are based on precedent, this result seems reasonable. Our results are stable across sub-samples, robust to the inclusion of a broad cross-section of firms, and coherent across the size spectrum of firms.

The rest of this paper is organized as follows: Section 2 discusses the details of our procedure for organizing case law and statutory law into indices measuring changes in breadth of copyright. Section 3 discusses our estimation framework and empirical results, and Section 4 concludes.

2 Measuring Copyright Protection

The breadth of copyright law evolves over time in two complementary ways: through statutory changes, and through court decisions. As in many areas of law, in copyright law, statutes describe the nature of the law in general terms, while court decisions describe how statutory decisions are implemented and enforced. Thus, our empirical methodology captures not only the impact of changes in the law's intent, but also the impact of changes in the degree and extent to which the law is enforced.

Our approach, in which we relate "news" about changes in the breadth of copyright decisions to the market valuation of firms, is forward looking. As a copyright is essentially an asset which generates a flow of future returns, all previous information concerning the breadth of copyright protection should already be reflected in the current valuation of firms. To the extent that case law is driven by precedent, one would expect that cases which broaden copyright protection by ruling in favor of the possessor of intellectual property (we give some examples below) expand the level of copyright protection that firms may expect in the future. Of course, there are both practical and theoretical difficulties in measuring changes in case law. Before discussing some of the difficulties and nuances of constructing indices of breadth of copyright, it is helpful to discuss our basic method. Our approach is as follows:

1. **Catalogue changes in copyright law.** - We begin by developing a list of "important" court decisions or new statutes relating to copyright protection. We focus on decisions made between 1986 and 1998; a time limitation imposed by firm level data availability from the firm level data source. We catalogue all decisions pertaining to copyright law over the time period made in the twelve United States Circuit Courts of Appeals, The Court of Appeals for the Federal Circuit, and the Supreme Court.

2. **Date the change.** We next matched court decisions with a decision or filing date, and grouped the case law into quarters. We followed a similar procedure in cataloguing statutory changes, using the date at which the President signed the bill into law.

3. **Assess the impact of the decision on breadth of copyright.** After reading each case in our list of important decisions, we recorded whether or not the outcome of the case could be said to broaden or narrow the breadth of copyright protection that firms may expect in the future.

4. **Construct a quarterly index capturing the nature of news on copyright protection.** For each quarter from 1986-1998, we used the data resulting from the first three steps to count the number of cases which "broadened" and "narrowed" copyright protection. The difference between these two numbers gives us an index of common law broadening of copyright protection net of cases which narrowed copyright.

Of course, our resulting index is far from perfect. Our baseline index makes no judgement as to the relative importance of different cases, but instead assumes that every high court decision is created equally. When a court decision is released, a general consensus may emerge that the case is somehow marginal. It is difficult to perfectly measure this type of historical assessment. However, in order to achieve some differential weighting on cases, we also use *ex post* information

to identify more important decisions. Our comprehensive list of cases is derived from publications which summarize copyright law developments in "real time." As is further described below, we use a more recent synopsis of federal copyright law to eliminate cases which are retrospectively less important, thereby obtaining a second index of *ex post* influential cases. This should allow us to approximately capture sentiment regarding the importance of individual court decisions.

Our index also does not include what might have been important decisions pertaining to copyright emanating from lower courts. We chose to focus decisions issued by federal appellate and higher courts for two reasons, one practical and one theoretical. As it stands, the time frame for our analysis required reading some 600 cases; if we had also included decisions from lower courts, this number would have expanded (by a conservative estimate) approximately tenfold. However, in our favor, by focusing on decisions from higher courts, it is likely that we have captured those decisions which are truly important at the margin, because cases which have been appealed a number of times are likely to address difficult and newer issues of legal interpretation.

We were also confronted with a number of practical difficulties in construction of the index. A non-negligible portion of cases simply could not be classified as broadening or narrowing copyright protection. Figuring most prominently in this subset, were three types of cases: work-for-hire cases, joint authorship cases, and jurisdictional cases. Work-for-hire cases result from disputes between workers and employers over who is truly the author of a work: the worker or the employer. In these cases, the breadth of copyright itself is not in question, but the ownership of it is. While one might draw some intuition about how, for example, future valuation of a software development firm might change if the court decided that copyright in software rested with the employee, this we judged was more of a distributional issue than an issue of copyright breadth.[9] Similarly, joint authorship cases

[9]In any case, the question as to how firm market valuation should be affected by changes in work for hire precedents becomes much more difficult to answer when two firms such as a software development company and a publishing company dispute ownership in copyright of software.

also do not pertain directly to breadth of copyright, but to the distribution of ownership rights. Jurisdictional cases do not involve issues of copyright breadth, but only whether or not the court in question (or some lower court) has the authority to rule in the case.

To give the reader a better feel for the exact nature of our indices, we now turn to discussion of some of the details of our indices. We first discuss the nature of the resulting index for statutory decisions, and then discuss the nature of our index resulting from an assessment of the path of common law copyright. We then discuss some of the reservations one might have with this approach.

2.1 Statutory Copyright Changes

Statutory changes in the U. S. generally occur relatively infrequently, and have without exception broadened the extent of copyright protection. Over the period 1985-1998, one can identify 6 important statutory decisions, listed below with the dates and a brief description of the legislation:

- October 31, 1985 - Berne Convention Implementation Act
- December 1, 1990 - Computer Software Rental Amendments Act
- June 26, 1992 - Copyright Amendment act of 1992
- Dec 8, 1994 - Uruguay Round Agreements Act
- October 27, 1998 Sonny Bono Copyright Term Extension Act/Fairness in Musical Licensing Act of 1998
- October 28, 1998 Digital Millennium Copyright Act

The Berne convention and the Uruguay Round Agreements expanded international enforcement of copyright law, the Sonny Bono act extended the term of copyrights substantially, the computer software rental amendment placed restrictions on the possibility of renting computer software,

thus broadening the copyright protection of software, and the Digital Millennium Copyright Act pronounced the deliberate circumvention of encryption designed to prevent unauthorized access an infringement. In the quarters corresponding to these changes, our index of statutory changes received a value of one, and was zero otherwise. There are, of course, some important (implicit) assumptions about the nature of statutory changes in the law, some of which we alluded to above in reference to case law. For one, this methodology effectively treats all innovations in statutory rules as identical. Second, it assumes that information about the timing of statutory decisions was not known substantially before the legislation was enacted.

2.2 Court Decisions and the Breadth of Copyright

Our case law index draws from the cases reported in Copyright Law Decisions.[10] This publication is a comprehensive summary of all copyright decisions made over roughly two year periods. For each of the two-year periods between 1984 to 1998, we obtained the corresponding volume, catalogued the dates of the cases and the nature of decisions, and tabulated the results.[11] From each of these measures, the result was X important decisions. Y of these broadened copyright, while Z narrowed copyright.[12] It is worth emphasizing that our methodology captures those innovations in copyright case law which were viewed as significant at the time our source was published. This implies that our measure of copyright case law innovation indicates important common law developments as determined in "real time" (contemporaneously rather than retrospectively). The comprehensive list of cases which is obtained from this source is further refined using recent scholarship. Brown and Denicola (2002) present a contemporary synopsis of prominent federal court decisions pertaining to copyright. If a cases is contained in both this source as well as our first source, we include that case

[10]The first volume of this publication is Commercepace.5emClearing House (1981). We employed the two-year volumes 1983-4 through 1997-8.

[11]We use Lexis-Nexis to identify the initial filing date for each of the cases.

[12]Each copyright case, accompanied with the court, and a brief description of the case, can be accessed at the following address: `http://www.usna.edu/Users/econ/bcunning/baker_cunningham_copyright_cases.xls`

in a second index. This index captures *ex-post* influential federal copyright cases. To the extent that interested parties were able to anticipate the retrospective importance of cases, this second index should provide a more accurate measurement of perceived changes in copyright case law.

To better illustrate our method, the following are some samples of the cases which entered into our indices. The sample serves also to illustrate the diversity of the cases considered by court. Perhaps some of the difficulties in judging whether or not a case in fact expanded the breadth of copyright protection will also become apparent to the reader. We categorized the following as decisions that narrowed the breadth of copyright protection:

- **Feist Publications v. Rural Telephone Service Co.** (499 U. S. 340, 111 S.Ct. 1282 (1991)) - The Supreme Court ruled that the partial copying of entries in a telephone directory did not constitute infringement of copyright.

- **Wallace International Silversmiths v. Godinger Silver Art Co.** (Certiorari Denied 499 U. S. 976, 111 S.Ct. 1622 (1991)) - The Supreme Court rules that baroque silverware produced by the defendant did not infringe the plaintiff's copyright in similar silverware because the design similarities were primarily the result of functional similarities in baroque silverware.

- **Lotus Development Corp. v. Borland International** (49 F.3d 807 (1995)) - The court found that the menu hierarchy of the Lotus 1-2-3 system is a functional aspect of design, and therefore not copyrightable.

- **Campbell v. Acuff-Rose Music** (510 U. S. 569, 114 S.Ct. 1164 (1994)) - The Supreme Court reversed a lower court in ruling that a version of the popular Roy Orbison Hit "Pretty Woman" produced by the rap act "2 Live Crew" is fair use.

- **Leibovitz v. Paramount Pictures Corp.** (137 F.3d 109 (1988)) - The court finds that a

parody of a popular photograph of then-pregnant actress Demi Moore featuring Leslie Nielsen used in advertising a movie was covered by fair use and did not constitute infringement.

Decisions that broadened copyright protection include:

- **Mason v. Montgomery Data** (967 F.2d 135 (1992)) - The court found that maps created and supplemented to include additional information compiled by the plaintiff were sufficiently original to warrant copyright protection.

- **Castle Rock Entertainment v. Carol Publishing Group** (150 F.3d 132 (1998)) - The court found that a quiz book on material deriving from the popular TV show "Seinfeld" constituted an infringement in spite of the defendant's protests that the book related only objective facts about the show.

- **Princeton University Press v. Michigan Document Service** (99 F.3d 1381 (1996)) - The court found that production of "course packets," which consist of collections of copyrighted articles arranged in booklet form for student use by a local copy service constitutes copyright infringement.

- **West Publishing Co. v. Mead Data Central** (799 F.2d 1219 (1986)) - The court prohibited Mead, producers of Lexis software for legal research, from adding West's "star pagination" to output, as the star pagination was novel enough to warrant copyright protection.

- **Los Angeles News Service v. Tullo** (973 F.2d 791 (1992)) - The court found that a service which marketed video clippings from television news broadcasts infringed broadcasters' copyrights.

Some specifics of the nature of the copyright case index are presented in Table 1. The first column of the table reports aggregate information about the index. Of higher-court cases over

the 15 year period, 542 allowed definitive judgement as to whether they broadened or narrowed copyright; of these decisions, 13 were made by the Supreme Court. The Supreme Court made 6 decisions which could be said to broaden copyright protection, and 7 which narrowed copyright protection. Generally speaking, this balance extends to the case law as a whole; high courts have not had a substantial tendency to either broaden or narrow copyright protection. Figure 1 shows the progress of the index over time by tracing the cumulative sum of the net decisions broadening copyright each quarter.[13] The cumulative count shows that there may be at best some small upward trend towards broadening copyright decisions in the case law, but by and large there was no definitive trend in the case law.

We have also categorized each case according to its relevance to a particular industry or industries. The last three columns of Table 1 break down the cases by 2-digit industry SIC code, and may help further clarify the nature of our index. SIC code 27 is the designation for publishers, including newspapers, books, magazines, and periodicals. We also included in this count cases pertaining to activities which could be construed as "miscellaneous" publishing, such as map production and duplication and greeting card manufacturing. SIC code 73 is reserved for firms which engage in software production or programming industries, and SIC code 78 refers to motion picture production and distribution. In each case, our data do not reveal any pronounced tendency for court decisions to broaden or narrow the breadth of copyright protection. We also experimented with further breaking down the data into 4-digit SIC codes, or including additional SIC codes, but found that the value-added of doing this was low, either because the results were too thin to be useful or enlightening, or because complementary financial data was not available.[14]

We now turn to specifying an empirical framework for assessing the impact of news about

[13] To aid in understanding the figure, for example, if 5 broadening decisions were made in a quarter and 2 narrowing decisions were made in a quarter, the cumulative count would increase by 3.

[14] After our first three industries, the most frequently represented industries were radio and television broadcasting, toy manufacturing, and garment manufacturing.

copyright protection on the market valuation of firms.

3 Empirical Specification and Results

In order to implement our approach for estimating the value of copyright protection, as priced by equity markets, we require a reduced-form specification. Vuolteenaho (2000, 2002) establishes a framework for estimating a dynamic system (VAR) containing excess returns, cash-flow news, and expected return news at the firm level. We focus on the excess returns equation in this specification and adapt it in order to: 1) ascertain the determinants of equity valuation at a higher (quarterly) frequency and 2) include measures of innovations in federal statutes and case law pertaining to copyright. The fundamental financial variables in the specification are:

R_{jit} – monthly % increase in price of common stock, quarterly average

F_{jit} – yield to maturity on three month Treasury bill, quarterly average

B_{jit} – book value of firm within quarter

M_{jit} – market value of firm within quarter

X_{jit} – earnings of firm, within quarter

where $j = 1, \ldots, J$ is an index of firms, $i = 1, \ldots, I$ is an index of industries, and $t = 1, \ldots, T$ is a quarterly index of time. From these fundamentals, we calculate the primary financial variables employed in the estimation framework. The log return on stock in excess of the risk-free rate is defined according to $r_{jit} \equiv \ln(1 + R_{jit} + F_{jit}) - \ln(1 + F_{jit})$. The log return on equity is calculated according to $e_t \equiv \ln(1 + X_{jit}/B_{jit-1})$ while the log book-to-market ratio is obtained from $\theta_{jit} = \ln(B_{jit}/M_{jit})$, as in Vuolteenaho.

We employ two final variables in order to measure alterations in the legal environment. The

first is a simple dummy variable, σ_t, taking on a value of one if there has been a change in federal statutes pertaining to copyright within the quarter. The second, γ_t, is a count of the number of cases broadening copyright in all branches of the federal judiciary, minus those cases narrowing copyright. Our specification explains the log excess return on equity as a function of these innovations in copyright law as well as lagged values of firm financial variables and an autoregressive process:

$$\begin{aligned} r_{jit} = \beta^0 \quad & + \textstyle\sum_{s=1}^{2}(\beta_s^\theta \theta_{jit-s} + \beta_s^e e_{jit-s} + \beta_s^\sigma \sigma_{t-s} + \beta_s^\gamma \gamma_{t-s}) + \sum_{i=1}^{I-1} \beta_i^d d_i \\ & + \beta^\tau \tau + \textstyle\sum_{s=1}^{3} \beta_s^q q_s + \sum_{s=1}^{4} \beta_s^r r_{jit-s} + \varepsilon_{jit} \end{aligned} \tag{1}$$

where d_i is an industry dummy variable, τ is a year trend and q_s is a quarterly dummy variable. We allow for firm-level heteroscedasticity in the error term.[15] It is important to note that we assume there is no role for firm-level fixed effects in our specification. This is consistent with prior techniques for predicting firm-level excess equity returns and implies that the presence of lagged dependent variables will not hamper the reliability of our results.[16, 17] In addition, this specification implicitly assumes that there are significant spillovers in copyright case law decisions so that the aggregate number of decisions in a quarter (lagged) has an impact on individual firms, regardless of whether the firm was directly involved in the case.[18] The book-to-market ratio is included in (1) to control for short-run undervaluation of equity which leads to subsequent increases in excess returns. Likewise, the return-on-equity captures the impact on excess returns of innovations in a firm's cash flow. In the late 1990s, aggregate and firm-level excess returns exhibited a significant increase. A time trend is included in order to control for this trend behavior in excess returns.

[15] Likelihood ratio tests regularly rejected the null hypothesis of homoscedasticity at a 1% level of significance.

[16] For a detailed analysis of the difficulties associated with fixed effects in the presence of lagged dependent variables, see Baltagi (1995), p. 125.

[17] There are solid theoretical reasons for believing that fixed effects are inappropriate in our estimation framework. Over long periods of time, the excess equity returns of one firm should not consistently and predictably be above or below the returns of other firms (equity traders should eliminate such persistent returns at the firm level). We also have an empirical rationale for excluding fixed effects: when our specification is estimated with firm fixed effects we fail to find a statistically significant improvement in the fit of the specification.

[18] We explore the robustness of this assumption.

Because of possibly delays in the transmission and processing of information in equity markets, we include a number of lags of the independent variables (the autoregressive terms are included to control for possible serial correlation). All results are obtained through feasible generalized least squares estimation.

Our firm-level equity market and financial data comes from the quarterly files in the combined COMPUSTAT / CRSP database. We obtained this information for industries which are primarily focused on the production of copyrighted material.[19] All common stock prices were adjusted for splits. In addition, missing book values were calculated from financial flow statistics and adjusted for tax considerations where possible.[20] Our information on copyright law was obtained through the process described above. We restricted our sample to the 1985-98 time period in order to obtain a reasonable cross-section of 29 firms in our sample.[21] Descriptive statistics, calculated from both the entire sample and the industry subsets, are presented in Table 2. Excess stock returns vary quite significantly across industries, with computer programming services exhibiting one of the highest returns and motion picture / videotape production the lowest. The dispersion in book-to-market ratios across industries is equally striking, with book printing and motion picture / videotape production exhibiting the highest and lowest book-to-market ratios, respectively.

Our primary empirical results are presented in Table 3 (firm and industry subscripts have been dropped). Coefficients in the first column of this table come from baseline estimates in which copyright measures are omitted from the specification. In general, our financial variables predict excess returns in a manner which is consistent with prior findings: the book-to-market and return on equity variables are associated with excess returns in a positive and statistically significant manner

[19]The SIC major group codes for those firms which we had an *a priori* reason for including in our sample are: 27 (Printing, Publishing and Allied Industries), 73 (Business Services) and 78 (Motion Pictures).

[20]The exact procedure used for identifying the variables above in the raw data and eliminating missing values is outlined in Vuolteenaho (2002) p. 238.

[21]Earlier and later time periods were characterized by relatively large gaps in the relevant financial variables and a rapid decline in the number of firms in our sample. We present results from a larger cross-section below.

with the coefficient on the latter variable exhibiting higher precision. The statistical significance of the coefficients on the first two lags of r provides evidence of persistence in equity returns, moreover, the roots of the autoregressive process are consistent with stability in equity returns over time (net of trend).

The results reported in the second column of Table 3 are obtained when the statutory and case law copyright variables are included as explanatory variables. Measures of legal innovations improve the fit of the fundamental financial model in a statistically significant manner (a likelihood ratio test establishes the joint significance of the four coefficients on statutory and case law innovations at a 99% confidence level). All coefficients take on a theoretically plausible sign suggesting that a broadening of copyright law is associated with an increase in equity returns. However, the statutory coefficients are not individually significant at conventional levels. The inability of statutes to meaningfully predict outcomes in copyright industries is not a unique finding. In marked contrast, the coefficient on the second lag of the case law variable obtains a 1% level of significance while the first lag of the case law variable is marginally significant (p-value of .13). These coefficients imply that excess returns for a firm in our sample increase by a total of 23 basis points two quarters after federal case law broadens copyright. The remaining columns in Table 3 provide a more detailed picture of the relationship between copyright law and the equity value of firms. In the third column, we include a contemporaneous measure of the net cases broadening copyright. The coefficient estimate on this variable could be unreliable if there is any reason to believe that high excess returns simultaneously increase the likelihood that case law would broaden copyright, so these results should be interpreted with caution. With the inclusion of this variable, the coefficient on the first lag of copyright becomes significant at the 10% level and our results imply a 32 basis point impact of case broadening.

One might be concerned that these results could be spurious. For example, it could be that

regularity in the timing of court decisions is arbitrarily synchronized with increases in excess returns. If this were the case, a broadening decision and a narrowing decision should exhibit a similar relationship to excess returns. In order to investigate this possibility, counts of the number of cases broadening and the number of cases narrowing copyright are entered separately as explanatory variables. We employ two lags of each of these variables. We obtain positive coefficients on the number of cases broadening copyright, these results are significant at the 10% level. According to these estimates, one case broadening copyright is associated with a 34 basis point increase in equity returns. In contrast, the coefficients on the case narrowing variables are negative with the second lag exhibiting a 10% level of significance. These results suggest that our case count variable does seem to represent a factor which drives equity valuation in a theoretically plausible and statistically significant manner. In the last column of Table 3, we differentiate between the origin of court decisions. The number of net cases broadening copyright decided by the Supreme Court (γ^{sup}) and the Circuit Court of Appeals (γ^{circ}) are employed as separate explanatory variables. In general, we obtain more precise results with Supreme Court decisions indicating that broadening by the high court is associated with a 110 basis point increase in excess returns. Our results suggest there is an anomalous and small short run *decrease* in excess returns one quarter after a Supreme Court decision but that equity values more than compensate for this drop one quarter later. As one might expect, Circuit Court decisions have a relatively smaller, but significant, positive impact on equity valuation.

In Table 4 we explore whether our results hold when we employ a more narrow set of cases which ex-post legal scholarship have identified as influential.[22] The results in the first column of this table indicate that the coefficients on these influential cases are larger in their point values with the first lag exhibiting relatively greater precision. Both coefficients are significant at conven-

[22]We have not presented all of the coefficients from estimating in this table, these results are available upon request from the authors.

tional levels and suggest that excess returns by 38 basis points in response to case law broadening copyright. The second column of results indicates that this result does not drastically change when contemporaneous case law counts are included in estimation (the new coefficient is associated with a p-value of .19). The third column of results, in which broadening and narrowing case counts are entered separately, yields the largest point estimate for the impact of broadening court decisions. The coefficients on γ^b are significant at a 5% level and imply that excess returns increase by 47 basis points two quarters after case law broadens copyright. The coefficients on the narrowing case count variables are not statistically significant at conventional levels.

In order to test the assumption implicit in our specification that a case directly pertaining to one narrow group of parties spills over to the equity valuation of a broader range of related firms we have matched each decision to those industries which are most directly associated with the focus of each case (we create this variable using the broad group of cases employed in the estimates from Table 3). The estimates from this exercise are presented in the fourth column and are generally consistent with the previously described findings of a positive and statistically significant relationship between equity valuation and copyright broadening case law. In the fifth column, we attempt to test the relative strength of the channels by which case law exerts an impact on excess returns, that is, whether the spill-over effect is stronger or weaker than the industry-level effect. When we include the original copyright count variable alongside the industry-matched case count variable, the relatively larger point value and statistical significance of the coefficient on the second lag of γ, in light of the imprecision in the coefficients on γ^{ind}, suggests that the spill-over effect across firms is relatively stronger. In general, the findings presented in Table 4 suggest that our original results are robust to a re-definition of our case count variable and may represent a conservative estimate of the relationship between equity valuation and case law.

The relatively limited number of firms in our sample may cause some concern over whether our

results would continue to hold across the wider cross-section of firms in copyright industries. In order for a firm to be included in our sample, we require that it has a continuous time series for each of the financial variables over the years 1986 - 1998. In Table 5 we present summary statistics for total sales in the years 1987, 92 and 97 for the 29 firms which meet our sample selection criterion. We are concerned that these firms are drawn from the larger, more stable, portion of the copyright industry population. In order to investigate this possibility, we divide our sample into three sub-periods (1986-89, 90-94, and 95-98). A continuous time series for all variables could be obtained for 30, 53, and 122 firms, respectively in these sub-samples. Sales summary statistics presented in Table 5 confirm that our narrow cross-section consisted of larger firms, average sales are consistently lower in the larger cross-sections. In 1997, average sales among the larger cross-section was less than half of the average for the 29 firm sample.

In Table 6 we attempt to investigate whether our baseline results obtain when smaller firms are included in our sample. The results reported in column (1) suggest that our fundamental reduced form specification performs quite poorly in forecasting excess returns: book-to-market and return on equity are not related to equity valuations in a statistically significant manner. Similarly, copyright law is very imprecisely related to excess returns. Turning to the second column of results, we find that earnings are related to equity valuations in a positive and statistically significant manner among the 53 firms in the 1990-94 period. In addition, the second lag of the copyright case law variable is positive and statistically significant at the 10% level. In the final sample of 122 firms, we obtain coefficients on both lags of the copyright variable which are positive and statistically significant at the 1% level.[23] Despite overall poor performance of our model in the first sub-period, the qualitative implications of our results are generally robust to the inclusion of smaller firms in our cross-section.

[23]The statutory variables are dropped from estimation in this sub-period since no major statutory innovations occurred.

There is one important qualification to this finding. The coefficient estimates reported in the first three columns of Table 6 deviate from prior estimates due to two considerations: the broader cross-section of firms and any possible instability over time in our model's parameters. In order to eliminate the latter influence, we split the 122 firm cross-section from the 1995-98 sub-period into three size categories (small, medium, and large) according to the size of total sales (small firms are those with sales below percentile 25 in 1997, medium - sales between percentile 25 and 75, large - sales above percentile 75). The results of this sample split are reported in the last three columns of Table 6. The coefficients on γ are positive among the smallest firms, but are not statistically significant. We also find that a broader copyright case law is related to excess returns in a positive and statistically significant manner among the 75% of firms in the medium and large ranges. In general, these results suggest that copyright is an important determinant of equity valuation across much of the size distribution of firms.

4 Conclusion

Existing research has provided limited empirical evidence that the state of copyright law is a significant determinant of the flow of copyrighted works or the return to copyright activity. The lack of such quantitative information hampers an understanding of whether current law has appropriately balanced incentives for creation with the distortions caused by an author's grant of excludeability. In this paper, we have presented measures of copyright law derived from both statute and case law. We find that, within a standard model of firm-level equity valuation, excess returns to equity in copyright industries are driven, in part, by the breadth of copyright as determined by courts. Our results are robust across the size distribution of firms and suggest that the state of case law is potentially one of the non-tangible assets effecting the value of equity (for more on this topic, see Chan, Lakonishok and Sougiannis (1999)).

While these findings are one of the few signs that law does have an important role in determining outcomes in copyright industries, a number of open questions remain. The response of equity value to case law may be driven by a host of possible considerations. When copyright case law is broadened, equity market participants may anticipate a larger flow of new and profitable copyright works due to the additional incentives provided authors and re-price equity accordingly. Alternatively, an equity market may incorporate into prices the additional "monopoly" returns which firms might derive from the existing body of copyrighted works. This paper has not determined which of these considerations underly the results. However, pursuing this topic is clearly important for future research.

The findings of such research may have been anticipated by an *amicus curiae* brief filed by seventeen prominent economists (29% of whom were Nobel laureates) as part of a Supreme Court case determining the constitutionality of the 1998 Sonny Bono Copyright Term Extension Act.[24] The authors of this brief conclude that lengthening the term of copyright by statute provides minimal additional incentive for the creation of new works, due to the length of time over which authors must discount the additional returns from excludeability. In contrast, such extensions significantly increase the return to existing works and represent a toll for "standing on the shoulders of giants" in the sense that the cost of creating derivative works rises in the length of copyright term.[25] This analysis suggests that the incentive effects of copyright case law may be less relevant in determining the response of equity valuation to copyright case law.

[24]The economists are George A. Akerlof, Kenneth J. Arrow, Timothy F. Bresnahan, James M. Buchanan, Ronald H. Coase, Linda R. Cohen, Milton Friedman, Jerry R. Green, Robert W. Hahn, Thomas W. Hazlett, C. Scott Hemphill, Robert E. Litan, Roger G. Noll, Richard Schmalensee, Steven Shavell, Hal R. Varian, and Richard J. Zeckhauser. The brief is Akerlof et. al. as Amici Curiae in support of Petitioners at 12, Eldred v. Ashcroft, No. 01-618.

[25]See Liebowitz and Margolis (2003) for a retort to this argument.

Table 1
Summary Statistics - Case Law

Court Branch			SIC Code 27	73	78
All	Broadening	278	79	61	27
	Narrowing	264	91	44	29
	Total	542	170	105	56
Supreme	Broadening	6	2	1	2
	Narrowing	7	1	0	0
	Total	13	3	1	2
Circuit	Broadening	272	77	60	25
	Narrowing	257	90	44	29
	Total	529	167	104	54

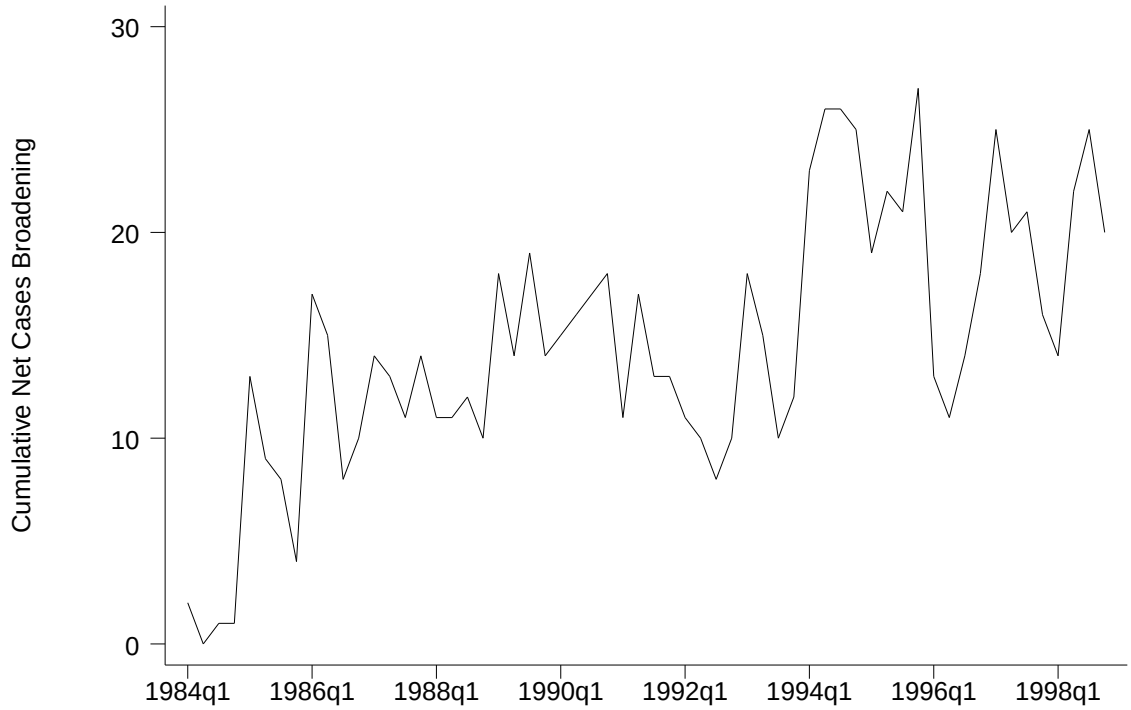

Figure 1
Copyright Case Law Over Time

Table 2
Summary Statistics, 1986:Q1 -1998:Q4

Variable	Mean	Std. Dev.	Min.	Max.	N
r	0.016	0.106	-0.489	2.483	1508
e	0.015	0.07	-0.714	0.961	1508
θ	0.505	1.534	-2.785	6.057	1508
γ	0.154	3.411	-8	7	1508
Newspapers (2711)					
r	0.011	0.049	-0.136	0.328	468
e	0.035	0.048	-0.714	0.259	468
θ	-0.324	0.705	-2.132	1.64	468
Periodicals (2721)					
r	0.014	0.079	-0.217	0.351	156
e	0.006	0.122	-0.682	0.961	156
θ	0.02	0.934	-1.723	1.48	156
Books (2731)					
r	0.015	0.071	-0.196	0.328	156
e	0.028	0.038	-0.203	0.146	156
θ	2.536	1.403	-0.267	5.628	156
Book Printing (2732)					
r	0.008	0.065	-0.153	0.173	52
e	0.014	0.029	-0.111	0.065	52
θ	3.639	0.652	2.4	5.478	52
Computer Programming Services (7371)					
r	0.028	0.099	-0.214	0.353	156
e	0.014	0.049	-0.19	0.082	156
θ	0.868	1.965	-2.397	6.057	156
Prepackaged Software (7372)					
r	0.019	0.158	-0.489	2.483	468
e	-0.002	0.074	-0.634	0.488	468
θ	0.426	1.206	-2.785	4.633	468
Motion Picture / Videotape Production (7812)					
r	0.001	0.107	-0.258	0.367	52
e	-0.007	0.098	-0.383	0.093	52
θ	-0.197	0.481	-0.876	0.834	52

Notes:

1. Variable definitions: r - log excess stock return, e - log return on equity, θ - log book to market ratio, γ - number of court decisions broadening copyright net of decisions narrowing copyright.
2. The newspapers, periodicals and books industry groups (2711, 2721, 2732) include firms which publish as well as firms which print and publish.
3. Each firm has observations over 52 quarters; there are a total of 29 firms across all industries.

Table 3
Dependent Variable - Log of Excess Returns

	(1)	(2)	(3)	(4)	(5)
θ_{t-1}	.001	.0004	.0003	.0005	.0007
	(.004)	(.004)	(.004)	(.004)	(.004)
θ_{t-2}	.007	.008	.008	.008	.007
	(.004)*	(.004)*	(.004)*	(.004)*	(.004)*
e_{t-1}	.148	.158	.157	.158	.16
	(.026)***	(.027)***	(.027)***	(.027)***	(.026)***
e_{t-2}	-.005	-.003	-.004	-.002	-.001
	(.026)	(.027)	(.027)	(.027)	(.026)
σ_{t-1}	.	.003	.004	.004	.003
		(.006)	(.006)	(.006)	(.006)
σ_{t-2}	.	.007	.005	.004	.012
		(.006)	(.007)	(.007)	(.006)*
γ_t	.	.	.0007	.	.
			(.0005)		
γ_{t-1}	.	.0007	.0009	.	.
		(.0005)	(.0005)*		
γ_{t-2}	.	.002	.002	.	.
		(.0005)***	(.0005)***		
γ^b_{t-1}	.	.	.	.002	.
				(.0008)*	
γ^b_{t-2}	.	.	.	.002	.
				(.0008)**	
γ^n_{t-1}	.	.	.	-.000	.
				(.0007)	
γ^n_{t-2}	.	.	.	-.001	.
				(.0007)*	
γ^{sup}_{t-1}	.	.	.	.	-.005
					(.004)*
γ^{sup}_{t-2}	.	.	.	.	.016
					(.004)***
γ^{circ}_{t-1}	.	.	.	.	.001
					(.0005)**
γ^{circ}_{t-2}	.	.	.	.	.0008
					(.0005)

Table 3
Dependent Variable - Log of Excess Returns

	(1)	(2)	(3)	(4)	(5)
r_{t-1}	-.079	-.085	-.088	-.084	-.083
	(.028)***	(.028)***	(.028)***	(.028)***	(.028)***
r_{t-2}	-.123	-.129	-.13	-.131	-.129
	(.027)***	(.027)***	(.027)***	(.027)***	(.027)***
r_{t-3}	-.041	-.045	-.043	-.046	-.034
	(.026)	(.026)*	(.026)*	(.026)*	(.026)
r_{t-4}	-.025	-.023	-.025	-.022	-.018
	(.026)	(.026)	(.026)	(.026)	(.026)
J	29	29	29	29	29
T	52	52	52	52	52
N	1508	1508	1508	1508	1508
L	1829.815	1837.253	1838.151	1838.105	1847.238
χ^2	117.472***	132.575***	134.783***	134.124***	154.71***

Notes:

1. Standard errors in parentheses, ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.
2. Variable definitions: r - log excess stock return, e - log return on equity, θ - log book to market ratio, σ - statutes broadening copyright, γ - number of court decisions broadening copyright net of decisions narrowing copyright, γ^b - number of decisions broadening copyright, γ^n - number of decisions narrowing copyright, γ^{sup} - net broadening decisions from the supreme court, γ^{circ} - net broadening decisions from appellate circuit courts.
3. All estimates obtained using Feasible Generalized Least Squares which adjusts for firm-level heteroscedasticity. Sample: 1986:Q1-1998:Q4. All specifications include a time trend as well as quarterly and industry dummy variables. These results are not reported but are available upon request from authors. Time trend, one quarterly dummy (Q3), and two industry dummies (for SIC 2731 and 2732) are significant in all specifications.
4. J - number of firms, T - number of quarters, N - number of observations, L - value of log-likelihood function, χ^2 - Wald test of joint significance of all coefficients (with degrees of freedom 18, 22, 23, 24, and 24 for each of the five specifications).

Table 4
Ex-Post Influential Cases & Industry Specific Estimates

	(1)	(2)	(3)	(4)	(5)
γ_t	.	-.0008	.	.	.
		(.0007)			
γ_{t-1}	.001	.001	.	.	.001
	(.0007)*	(.0007)			(.0003)
γ_{t-2}	.003	.003	.	.	.002
	(.0007)***	(.0007)***			(.0007)***
γ^b_{t-1}	.	.	.002	.	.
			(.0008)**		
γ^b_{t-2}	.	.	.003	.	.
			(.0008)***		
γ^n_{t-1}	.	.	.0006	.	.
			(.001)		
γ^n_{t-2}	.	.	-.001	.	.
			(.001)		
γ^{ind}_{t-1}	.	.	.	.002	.001
				(.001)	(.001)
γ^{ind}_{t-2}	.	.	.	.002	-.0003
				(.001)*	(.001)
J	29	29	29	29	29
T	52	52	52	52	52
N	1508	1508	1508	1508	1508
L	1839.9	1840.773	1841.256	1834.545	1837.161
χ^2	137.639***	139.431***	139.47***	126.207***	132.332***

Notes:

1. Standard errors in parentheses, ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.
2. Variable definitions: γ - number of court decisions broadening copyright net of decisions narrowing copyright, γ^b, γ^n - number of decisions broadening and narrowing copyright, respectively. In columns (1) through (3), these variables only capture those cases discussed by Brown and Denicola (2002), we therefore view these cases as ex-post influential. γ^{ind} - net broadening decisions matched to the relevant industry by two-digit SIC code; this variable captures all cases.
3. All estimates obtained using Feasible Generalized Least Squares which adjusts for firm-level heteroscedasticity. Sample: 1986:Q1-1998:Q4. All specifications include a time trend as well as quarterly and industry dummy variables. These results are not reported but are available upon request from the authors.
4. J - number of firms, T - number of quarters, N - number of observations, L - value of log-likelihood function, χ^2 - Wald test of joint significance of all coefficients (with degrees of freedom 22, 23, 24, 22, and 24 for each of the five specifications).

Table 5
Summary Statistics - Total Sales (millions)

29 Firm Cross-Section				**Large Cross-Section**			
Average	**Min.**	**Max**	**Year**	**Firms**	**Average**	**Min**	**Max**
140.25	.022	835.39	1987	30	135.90	.02	835.39
161.95	0	935.09	1992	53	112.86	0	935.09
238.31	.17	1318.82	1997	122	109.17	.12	1318.82

Table 6
Sub-Sample Estimates

	(1) 1986-89	(2) 1990-94	(3) 1995-98	1995-98 (4) Small	1995-98 (5) Medium	1995-98 (6) Large
θ_{t-1}	-.001	.003	-.001	0	-.0006	-.004
	(.007)	(.009)	(.003)	(.016)	(.004)	(.004)
θ_{t-2}	.006	.008	.01	.032	.007	.01
	(.007)	(.008)	(.003)***	(.016)**	(.004)	(.004)**
e_{t-1}	-.006	.092	.071	.071	.057	.088
	(.032)	(.03)***	(.017)***	(.036)**	(.025)**	(.032)***
e_{t-2}	-.006	-.021	.009	-.003	.019	-.013
	(.031)	(.034)	(.018)	(.034)	(.028)	(.031)
σ_{t-1}	.017	.002	.	.	.	.
	(.018)	(.006)				
σ_{t-2}	.023	-.001	.	.	.	.
	(.016)	(.007)				
γ_{t-1}	.0005	0	.002	.002	.0003	.003
	(.001)	(.001)	(.0005)***	(.002)	(.0008)	(.0006)***
γ_{t-2}	.002	.001	.003	.001	.004	.004
	(.002)	(.0008)*	(.0005)***	(.002)	(.0008)***	(.0006)***
r_{t-1}	-.129	-.13	-.148	-.215	-.117	-.167
	(.051)**	(.03)***	(.027)***	(.063)***	(.037)***	(.052)***
r_{t-2}	-.172	-.07	-.046	-.111	-.014	-.053
	(.046)***	(.027)***	(.027)*	(.057)**	(.037)	(.053)
r_{t-3}	-.146	.05	.05	-.013	.08	.029
	(.044)***	(.027)*	(.026)*	(.056)	(.036)**	(.054)
r_{t-4}	.014	.02	-.04	-.036	-.07	.008
	(.043)	(.026)	(.025)	(.054)	(.035)**	(.052)
J	30	53	122	31	62	29
T	16	16	12	12	12	12
N	480	848	1464	372	744	348
L	586.563	1105.02	1392.979	203.046	701.071	513.422
χ^2	59.924***	112.35***	179.131***	50.028***	67.391***	121.796***

Notes:

1. Standard errors in parentheses, ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.
2. Variable definitions: r - log excess stock return, e - log return on equity, θ - log book to market ratio, σ - statutes broadening copyright, γ - number of court decisions broadening copyright net of decisions narrowing copyright.
3. To categorize firms by size, sales were averaged across the four quarters of 1997. Those firms with sales below the 25th percentile of this value were categorized as small, those firms with sales greater than or equal to the 25th percentile and less than the 75th percentile were categorized as medium and those firms with sales greater than or equal to the 75th percentile were categorized as large.
4. All estimates obtained using Feasible Generalized Least Squares which adjusts for firm-level heteroscedasticity. All specifications include a time trend as well as quarterly and industry dummy variables. These results are not reported but are available upon request from authors.
5. J - number of firms, T - number of quarters, N - number of observations, L - value of log-likelihood function, χ^2 - Wald test of joint significance of all coefficients (with degrees of freedom 22, 23, 21, 19, 21, and 19 for each of the six specifications).

References

Anonymous, "The Supreme Court Docket; The Coming of Copyright Perpetuity," *The New York Times*, January 16 2003, p. A. 28.

Baltagi, Badi H., *Econometric Analysis of Panel Data*, New York: John Wiley and Sons, 1995.

Besen, Stanley M. and Leo J. Raskind, "An Introduction to the Law and Economics of Intellectual Property," *Journal of Economic Perspectives*, Winter 1991, *5* (1), 3–27.

Brown, Ralph S. and Robert C. Denicola, *Cases on Copyright: Unfair Competition, and Related Topics Bearing on the Protection of Works of Authorship*, 8th ed., New York: Foundation Press, 2002.

Chan, Louis K. C., Josef Lakonishok, and Theodore Sougiannis, "The Stock Market Valuation of Research and Development Expenditures," Working Paper 7223, National Bureau of Economic Research 1999.

Chiang, Eric and Djeto Assane, "Software Copyright Infringement among College Students," *Applied Economics*, January 2002, *34* (2), 157–166.

Commerce Clearing House, *Copyright Law Decisions*, Chicago: Commerce Clearing House, 1981.

Epstein, Richard A., "Congress's Copyright Giveaway," *Wall Street Journal*, December 21 1998, p. 1.

Harbaugh, Rick and Rahul Khemka, "Does Copyright Enforcement Encourage Piracy?," Clarement Colleges Working Papers 2000-14, Clarement McKenna College 2000.

Hui, Kai-Lung and I. P. L. Png, "One the Supply of Creative Works: Evidence from the Movies," *American Economic Review*, May 2002, *92* (2), 217–220.

Johnson, William R., "The Economics of Copying," *Journal of Political Economy*, February 1985, *93* (1), 158–174.

Khan, B. Zorina, "Do Property Rights Matter? Evidence from U. S. International Copyright Law, 1790-1910," Discussion Paper, Bowdoin College 2001.

Khan, Zorina and Kenneth L. Sokoloff, "The Early Development of Intellectual Property Institutions in the United States," *Journal of Economic Perspectives*, Summer 2001, *15* (3), 233–246.

Klein, Benjamin, Andres V. Lerner, and Kevin M. Murphy, "The Econonomics of Copyright Fair Use in a Networked World," *American Economic Review*, May 2002, *92* (2), 205–208.

Kranenberg, Hans Van and Annelies Hogenbrink, "Determinants of Multimedia, Entertainment, and Business Software Piracy: a Cross-National Study," Maastricht Research School of Economics of Technology and Organization Research Memorandum 039, METEOR 2003.

Landes, William M. and Richard A. Posner, "An Economic Analysis of Copyright Law," *Journal of Legal Studies*, June 1989, *18* (2), 325–63.

Lessig, Lawrence and Pamela Samuelson, "In Defiance of the Public Interest," *The Washington Post*, July 13 1998, p. A. 21.

Liebowitz, Stan and Stephen Margolis, "Seventeen Famous Economists Weigh in on Copyright: the Role of Theory, Empirics, and Network Effects.," Working Paper, Social Science Research Network 2003. available at `http://papers.ssrn.com/sol3/papers.cfm?abstract_id=488085`.

Miceli, Thomas J. and Richard P. Adelstein, "An Economic Model of Fair Use," Department of Economics Working Paper 2003-38, University of Connecticut 2003.

Novos, Ian E. and Michael Waldman, "The Effects of Increased Copyright Protection: an

Analytic Approach," *Journal of Political Economy*, April 1984, *92* (2), 236–246.

Plant, Arnold, "The Economic Aspects of Copyright in Books," *Economica*, May 1934, *1* (2), 167–195.

Towse, Ruth, "Copyright and Economic Incentives: an Application to Performer's Rights in the Music Industry," *Kyklos*, 1999, *52* (3), 369–390.

Vuolteenaho, Tuomo, "Understanding the Aggregate Book-to-Market Ratio and Its Implications to Current Equity-Premium Expectations," Working Paper, Harvard University 2000.

__ , "What Drives Firm-Level Stock Returns?," *Journal of Finance*, 2002, *57* (1), 233–264.