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THE MEASUREMENT OF "COPYRIGHT" INDUSTRIES: THE US EXPERIENCE

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Abstract. This paper outlines the experiences of the economist who elaborated the studies on the economic importance of copyright for the US economy.

1. Introduction

In 2001, the US industries that produce or distribute copyrighted works or the products that are consumed directly with copyrighted works contributed at least $791.2 billion or 7.75% to the US Gross Domestic Product ("GDP").[1] In the same year, these industries employed nearly 8 million workers, or approximately 5.9% of the total US workforce.[2] These figures are contained in the most recent report published on behalf of the International Intellectual Property Alliance ("IIPA") under the title Copyright Industries in the U.S. Economy. The 2002 report is the ninth such document prepared on behalf of the IIPA since the first report was released in November 1990. Along with colleagues at Economists Incorporated, I have been directly involved in each of these studies as author or co-author of each report.

The IIPA was formed in 1984. Its current membership includes the Association of American Publishers ("AAP"), the American Film Marketing Association ("AFMA"), the Business Software Alliance ("BSA"), the Entertainment Software Association ("ESA"), the Motion Picture Association of America ("MPAA") and the Recording Industry Association of America ("RIAA"). These associations represent over 1,300 US companies that produce and distribute copyright-protected materials throughout the world. The products that are sold or rented by IIPA member companies encompass "all types of computer software including business applications software and entertainment software (such as videogames CDs and cartridges, personal computer CD-ROMs and multimedia products); theatrical films, television programs, home videos and digital representations of audiovisual works; music, records, CDs and audiocassettes; and textbooks, trade books, reference and professional publications and journals (in both electronic and print media)."[3]

US companies in the IIPA membership associations include the largest producers and distributors of copyright protected works in the world. Some member companies are focused on one or a few types of copyright-protected works but other companies compete in numerous product and geographic markets throughout the world. The fact that in 1984, so many diverse US companies and industry associations could join hands to form the IIPA is significant in itself. The continued support

[1] See Siwek (2002), Tables 1 and 3.
[2] See Siwek (2002), Tables 5 and 6.
[3] For more information about the IIPA, see http://www.IIPA.com.

for the IIPA by these companies clearly reflects the persistence and seriousness of a problem that they face in common. Whether diversified or not, each firm has long experienced theft of its intellectual property in US and particularly in foreign markets. The need to address the theft of intellectual property on a global basis has provided a strong and continuing motivation to support the ongoing activities of the IIPA.[4]

The member firms of the IIPA associations face the common problem of piracy because their "core" products consist largely of "public goods". Unlike say the consumption of an ice cream cone, one's consumption of a "pure" public good does not reduce the quantity of that good that is available to others. While national defense is the classic example of a "pure" public good, a television program might also be considered very nearly a "pure" public good. This is because the cost of producing the program is independent of the number of people who may eventually view it. Please note however that this example ignores the possibility that the production cost of a television program may well affect the number of people who might *want* to view the program. Some IIPA association members also produce mixed public/private goods in which the product's content is a public good that is delivered to consumers in the form of a private good. Significantly however, nearly all of these goods can easily be copied, at least in rudimentary form. These product characteristics create strong incentives for producers and distributors of public goods to take measure to restrict or exclude non-paying (i.e. free-rider) consumers from legitimate markets. Absent restrictions, non-paying viewers, listeners and users could consume public goods without making payment to the ultimate producer. Depending on the intensity and pervasiveness of free riding, these problems could serve to reduce, if not eliminate, a producer's overall return on investment.[5] Over time, lower returns could lead to the production of fewer original products, the production of lower quality products, or both.

Motion pictures, television programs, recorded music, software including video game software and printed works all contain large public good components. In the US the common issues associated with protecting US produced public goods from free-rider problems and from other trade barriers led the industries that produce and distribute these products to combine forces. The IIPA was formed to respond to the public policy challenges that confront these producers and distributors with a single, unified front. The success of the IIPA in turn, led the individual industry representatives to the IIPA to ask a series of different, but related questions. Those questions were posed as follows in the Preface to the first "Copyright Industry" study in November 1990:[6]

> While each component of the overall copyright-based industry was achieving significant growth during the period reflecting the strong demand for its products around the world, each of us had only a general notion of how all the copyright industries taken together,

[4]In many markets, US firms that produce and distribute copyright-protected works also face trade barriers including TV program broadcast quotas and restrictions on repatriation of foreign earnings.

[5]For emerging artists, the availability of freely copied goods might provide certain promotional benefits in the short run. However, even these artists must ultimately find some way to restrict at least some free-rider consumption of their products in order to earn compensation for their creative expression.

[6]See Siwek and Furchtgott-Roth (1990), Preface, p. iii.

> united by their complete dependence on effective protection for intellectual property, fit into the U.S. economy as a whole. How important are our companies – part of the so-called 'new' service and information-based economy – to our future? How do we compare to the 'older,' so-called 'smokestack' industries?

In direct response to these and other related questions, the IIPA commissioned its first study of the "Copyright Industries" in the US economy in 1990.

From 1990 to the present, the copyright industry studies described in this paper have attempted to measure the economic contribution of US industries that depend on copyrights. The studies have not attempted to analyze the economic contribution of copyright protection itself. In other words, these studies do not purport to quantify differences between the US copyright industries, as they now exist, and the hypothetical economic performance of a set of US industries that, absent copyright protection, might (or might not) produce and distribute movies, recorded music and software. Legal protection for copyrighted works does exist and has existed in the developed world for many years. At the same time, the developed world and, in particular the United States, has emerged as a major producer, distributor and exporter of copyright-protected products throughout the world. Because of these parallel trends, there is little, if any sentiment in the United States to consider even the hypothetical abandonment of copyright protection for US products. The US copyright community has not therefore sought to predict how the theoretical removal of all copyright protection might transform the size, scale and character of the copyright industries in the United States. As noted above, the research task put to us had always focused on the more manageable question, "Taken together, how do the companies and industries that create and distribute copyright-protected works, fit into the US economy as a whole?"

2. Industry Classification

Certain industries, including the IIPA membership industries, fundamentally exist to create and sell copyright protected works. These industries generally produce copyright protected works and many (but not all) also distribute copyright-protected works to others. In the 1990 study, we concluded that these "core" copyright industries included newspapers, periodicals, book publishing, radio and television broadcasting, record and tape production, motion picture production, distribution and exhibition, theatrical productions, advertising, computer programming and software development.[7]

Our original choices in this regard reflected both our own assessment of the nature of each industry's output and the conclusions reached in two earlier studies of US copyright industries with which we were familiar. The two earlier studies, both published in 1984, were: United States Copyright Office (1984) and Rubin (1984). Despite their age, these studies provided useful checks on various industry classification issues that we faced in the 1990 study.

We chose to define the core copyright (and indeed all copyright) industries using the Standard Industrial Classification ("SIC") definitions that had, for many years, been employed by the US government in a variety of statistical reports and measures. We decided that 100% of each "core" industry, as defined by SIC code,

[7]My co-author in the original 1990 study and in four subsequent copyright industry reports for the IIPA was Harold Furchtgott-Roth.

should be classified as a core copyright industry. This decision gave precedence to classification over function. It meant that some "core" copyright industries (such as motion pictures) would include, within the core industries, a distribution component while other "core" copyright industries (such as recorded music) would not. For those core copyright industries for which the SIC definition was limited solely to production, the associated distribution component would not be identified separately. For these industries then, distribution would only be captured as part of the overall copyright distribution industry factor to be discussed below.[8]

Beyond the "core" copyright industries, we established three additional industry classifications to be followed in all subsequent studies. First, we recognized that a number of US industries produce output of which only a part is protected by copyright under US law. These "partial" copyright industries range from fabric manufacturing to the production of costume jewelry and dolls. The extent to which each "partial" copyright industry depends specifically on copyright protection could not be empirically determined in our study or in prior studies. The Rubin study however, set forth specific, industry-by-industry factors that could be applied in our own efforts. In addition, we consulted IIPA member company representatives and, for several partial copyright industries, reviewed industry-published sources in order to validate the Rubin assumptions where possible. For individual "partial" copyright industries, further research into this issue could prove beneficial in future studies in the United States and in foreign markets.

In addition to "core" and "partial" copyright industries, we also established a third category known as copyright "distribution" industries. These were industries that devoted at least a portion of their output to the distribution of copyrighted works to businesses and ultimate consumers. The basic copyright distribution industries included major transportation industries such as railroad, trucking, air and water transit services, wholesale distribution and retail distribution. While each of these industries was involved in the distribution of copyright-protected works, each industry also distributed non-copyright protected works as well. Unfortunately, the government statistics that we reviewed did not suggest any obvious method to estimate how much distribution output could reasonably be assigned to copyright vs. non-copyright-protected works.

We addressed this problem through the creation of a formula. Using aggregate statistics from the US Census and the Bureau of Economic Analysis, we derived non-distribution copyright industry value-added as a percentage of non-distribution GDP for the United States as a whole. The basic premise of our formula was that the share of distribution that could reasonably be assigned to the copyright industries should be proportional to the copyright industries' share of the rest of the economy. In this way, we could estimate the percentage of overall distribution that could be considered copyright distribution for purposes of our study.

The "copyright-related" industries represented the final category of copyright industry that we established in the 1990 study. These industries produce and distribute works that are used wholly or principally in conjunction with copyrighted materials. Computer hardware represents a classic example of a copyright-related industry. In our original study, we conservatively included only computer and television and radio set manufacturers as copyright-related industries. Our decision

[8]For many industries, the adoption in the US of the North American Industry Classification System (NAICS) improves this situation dramatically. Many NAICS industries are defined and reported in a more disaggregated form than the industries defined in the SIC classification system.

to limit the copyright-related industries provides one of several instances where we adopted extremely conservative assumptions in the conduct of these studies. Two other such instances included our classification decisions with regard to the output of academic institutions and with respect to the in-house production, by non-copyright industries, of copyright protected works. Our industry classification system excluded all academic schools, colleges and universities from any inclusion among the copyright industries. This decision was made even though these entities are both consumers and major producers of copyright-protected works. Our system also excluded any fractional recognition of industries that create or distribute copyright protected works as part of their overall efforts to sell non-copyright protected products and services. For example, our study ignores both corporate in-house data processing services and the in-house production efforts of durable goods manufacturers who create and distribute manuals for their products.

3. Economic Measures

Having identified and classified the copyright industries, we then turned to the question of measurement. The size or economic importance of an industry can be measured in many ways. Revenues, market value of assets and net profits represent only a few of the many possible alternatives. In this study however, in order to assess the "importance" of the copyright industries in the US economy, we decided on three separate measures that more closely conform to published US government statistics on the economy as a whole. These measures were value-added to GDP, employment and foreign sales. In our view these measures each emphasized different aspects of the economic contribution produced by the US industries that depend on copyright protection.

3.1. **Value Added.** Value added is the most common method used to measure an industry's contribution to the national economy. Value added is "the difference between a firm's sales and its intermediate purchases of materials and services from other firms. It is equal to the contributions of capital and labor to the firm's sales as measured by the incomes that they receive. Because value added includes only the firm's own contribution to output, the sum of value added, and of the sums of the incomes earned in production, equals Gross Domestic Income ("GDI") and Gross Domestic Product ("GDP")."[9] Since value added measures *each* industry's contribution to GDP, it is of particular value when comparing industries that differ in the degree to which they rely on intermediate purchases of materials and services from other industries. One industry could report lower sales but higher value added than another industry solely because the first industry does not rely significantly on inputs purchased from other industries.

Unfortunately, in practice, value added is more easily measured for some industries than for others. In 1990, the US Bureau of Census reported shipment data (in dollars) and value added on a reasonably current basis for the major manufacturing industries in the United States. These industry-specific data however, were not generally published for most non-manufacturing industries and for service industries in the 1990 time frame. Moreover, even in the manufacturing industries, the underlying sales figures reported by the US government frequently differed dramatically from industry sales data made available to us from industry sources.

[9]See Lawson et al. (2002), p. 19.

In addition to these sources, in 1990, the Bureau of Economic Analysis of the US Department of Commerce generated detailed measures of value added by industry in its published reports on the Input-Output structure of the United States.[10] While these data ultimately proved useful for our report, they suffered from two infirmities: First, the Input-Output ratios focused on broad industry categories that generally encompassed more than the copyright industries that we had identified. Second, the Input-Output studies were generally out of date by five years or more.

We attempted to resolve these data problems by analyzing multiple measures of both industry output and industry value added from both government and industry sources. These multiple measures were arrayed and compared for consistency and timeliness. We sought to identify a consensus figure from these disparate data sources so that our ultimate selection of industry-by industry value added could be validated at least in a general sense.

In the 1990 study, we concluded that, in 1989, the value added of the "core" copyright industries in the United States was $173.7 billion (in 1989 dollars) or 3.3% of US GDP.[11] By 2001, the value added by these core industries had risen to $535.1 billion (in 2001 dollars) or 5.24% of GDP.[12] We also concluded that the value added by the total copyright industries had risen from $302.7 billion (in 1989 dollars) or 5.8% of US GDP to $791.2 billion (in 2001 dollars) or 7.75% of US GDP.

3.2. **Employment.** Employment (i.e. number of employees) in the copyright industries also represented an obvious measure of the importance of these industries to the US economy. In the United States, the US Bureau of Labor Statistics ("BLS") publishes various measures of employment by industry. Even in 1990, these data were generally available on a reasonably current basis (i.e. within the last year) and were often available at the three and even the four-digit SIC level. When the BLS data did not report employment for an industry to the level of detail needed for purposes of our study, the value was estimated by applying to the employment measure of the broader category, the ratio of the value added of the narrower category to the value added of the broader category. For the partial copyright and copyright distribution industries, the copyright employment value for each industry was calculated by multiplying total employment for each industry by the corresponding partial and distribution copyright factors discussed above.

In the 1990 study, we concluded that, in 1989, total employment in the "core" copyright industries in the United States was 2,620,000 or 2.2% of total employment in the US.[13] By 2001, employment in the core industries had risen to 4,711,200 or 3.49% of total US employment.[14] We also found that US employment in the total copyright industries had grown from 5,430,000 in 1989 or 4.6% of US employment to 7,972,700 in 2001 or 5.90% of total employment in the US.

3.3. **Foreign Sales.** Many of the US industries in the "core" achieve substantial revenue from sales in non-US markets. These industries also confront serious issues of intellectual property theft in overseas markets. For these reasons, the importance of the copyright industries as major US "exporters" represented a critical area to be explored in all of these studies.

[10]See, for example, Planting (1984) and Planting (1987).
[11]See Siwek and Furchtgott-Roth (1990), Charts 1 and 2.
[12]See Siwek (2002), Appendix A, Tables 2 and 3.
[13]See Siwek and Furchtgott-Roth (1990), Charts 3 and 4.
[14]See Siwek (2002), Appendix A, Tables 5 and 6.

Unfortunately, in 1990, US government statistics on trade flows and trade deficits were not sufficiently disaggregated to shed light on copyright industry performance in foreign markets. Data from the US Department of Commerce separated US trade flow data into merchandise (goods) imports and exports, services imports and exports and investment income flows.[15] Within the services category, these data were further disaggregated as between royalties and licenses, other private services, travel related services and other. Within these categories in turn, the Commerce Department reported, by industry, other private services receipts and payments but these data were provided only for unaffiliated transactions. Moreover, industry-by-industry breakdowns were not available for investment income flows. Finally, these limited industry-by-industry receipts differed markedly from the non-government data that we could obtain from industry sources at the same time. For these reasons, we did not attempt to derive foreign sales or receipts data for the copyright industries from US trade flow statistics.

In other data sources published by the Department of Commerce, it was possible to identify "imports" and "exports" for certain industry-specific producers of copyright "products" including newspapers and periodicals. Similar data were also available for US exports of books although export book shipments of less than $2,500 were not counted as book exports by the Department of Commerce. We attempted to correct for this underreporting problem after consultation with industry sources and consultants.

These government data did not extend to other core industries including motion pictures, records and tapes and software. For the motion picture and recorded music industries, we obtained foreign sales data directly from the industry associations themselves. With respect to prepackaged software, we reviewed various industry studies and periodicals in order to derive a conservative estimate of US software sales in foreign markets.

In the 1990 study, we concluded that foreign sales of the following selected core copyright industries: pre-recorded records and tapes, motion pictures, TV programs and home video, computer software, newspapers, books and periodicals were at $22.3 billion.[16] By 2001, we estimated that the same selected core copyright industries generated at least $88.97 billion in overseas sales.[17]

4. Measurement Issues and Emerging Solutions

As set forth above, the most serious problems encountered in the original, 1990 US copyright industry study generally affected industry classification, non-core industry reliance on copyrights and/or copyrighted products and timeliness of underlying data. These problems were addressed with the best information available but judgments invariably were made. Where possible these judgments were designed to reflect conservative assumptions throughout.

In 2004, much has changed with regard to the data problems originally encountered in 1990. The US industrial classification system itself has now been revised significantly through the adoption of the North American Industry Classification System ("NAICS"). In contrast to the SIC system, NAICS identifies hundreds of new and emerging industries, particularly in the advanced technology sectors.

[15] See US Department of Commerce (1990), Table 1.
[16] See Siwek and Furchtgott-Roth (1990), Table 13.
[17] See Siwek (2002), Appendix A, Table 9.

These new industries include industries that reproduce computer software, industries that manufacture compact disks, the cable television network industry and the satellite communications industry. Over the last several years, NAICS has been adopted by individual government agencies including the US Census Bureau and the US Bureau of Labor Statistics. In future studies, the adoption of NAICS should help address many of the most pressing industry classification issues from the past. NAICS codes may also permit more precise recognition of the industries that specifically distribute copyright protected works.

Recent efforts by the World Intellectual Property Organization ("WIPO") may also help address questions of industry classification particularly with respect to comparisons across nations. In 2003, WIPO released its first *Guide on Surveying the Economic Contribution of the Copyright-Based Industries*.[18] This publication reflects the efforts of a working group of economists,[19] experienced in the preparation of these studies, who, under the guidance of the Chairman of the WIPO Standing Committee on Copyright and Related Rights, sought to reach consensus on the myriad issues involved in creating an internationally accepted standard for these studies. The *Guide* commits these discussions to a specific format and set of guidelines for the preparation of copyright industry studies generally. While the ultimate recommendations for industry identification and classification that appear in the *Guide* do not follow precisely the outline of the US studies, there is sufficient commonality between the two standards that future studies in the US will almost certainly reflect aspects of the WIPO effort.

Ultimately, as a result of the adoption of both the NAICS system and the international standard set forth in the WIPO *Guide*, industry classification for the copyright industries will become more detailed and, for that reason alone, more reliable. Other changes, including more timely publishing of input-output studies by the US Bureau of Economic Analysis, will also produce data that is both more current and more consistent internally. These changes too, should improve reliability and accuracy of future copyright studies around the world. Finally, with more current and more finely disaggregated data by industry, our ability to conduct supplemental studies of specific industries is also likely to improve. The need for better information as to the partial copyright industries has already been mentioned. In addition, as the list of copyright-related industries expands beyond those first chosen in 1990, more precise information as to the degree to which output from copyright-related industries is correlated with output from specific core copyright industries may well become possible.

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[18] See World Intellectual Property Organisation (2003).

[19] Mr. Siwek was the US member of the Working Group.

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