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ISSUES IN ASSESSMENT OF THE ECONOMIC IMPACT OF COPYRIGHT

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Abstract. This article explores methods and issues in measuring the contributions of copyright industries to national economies. It reveals the importance of copyright value creation, identifies copyright industries and activities that make economic contributions, discusses problems of measurement, compares methods used and reveals difficulties in comparability of existing research, and provides suggestions for improving and undertaking future research.

1. Introduction

Copyrighted works and material and the industries that exploit the value of these works and material are important contributors to the economies of industrialised countries. The value of copyrighted works is important in economic terms and its significance is increasing dramatically because information and communications technologies have become the fundamental bases for value creation in a wide variety of industries in developed societies.

The shift from industrial society to information society that is dependent upon knowledge creation and the development, processing, and use of information places copyright at the very centre of economic development, because the industries that produce copyrightable works provide the central communications links and content that are used in other economic sectors of the information society.

Copyrighted works and materials have different influences on and importance in different sectors of the economy. For some sectors or industries they have fundamental importance, that is, the industries that would not exist without copyrighted works and other matter. These industries are called core copyright industries. Other industries utilising copyright-protected material in value creation are divided into categories according to the importance of copyright to them. Table 1 classifies copyright industries into three categories: core copyright industries, copyright-dependent industries, and other copyright industries.

Core copyright industries operate nearly exclusively with copyrighted works and other subject matter. The task of these industries is to create, produce, or distribute copyrighted works and other subject matter. All activities in these industries are tied to copyrighted works and other subject matter. All activities of these industries should be included in measures of the economic importance of copyright.

Copyright-dependent industries are largely dependent on copyrighted works and other subject matter, producing either production or consumption goods for copyright protected material. In some studies the industries in this category are called

copyright hardware industries because they include industries manufacturing hardware to be used in the creation, production, or consumption of the copyrighted works.[1]

Table1: Copyright Industries		
Category	**Definition**	Industries
Core Copyright Industries	Industries that produce copyrighted works and other subject matter. Industry that would not exist without copyrighted works and other subject matter	Literature and press, music, theatre, film and video, photography, visual arts, radio and TV, software and databases, architecture, advertising, industrial design
Copyright Dependent Industries (required hardware)	Industries whose operations essentially depend on copyrighted works. Industries that would be considerably smaller without copyrighted works and other subject matter.	Manufacture and distribution of electronics (TV sets, radios, VCR and CD players, etc.), manufacture and distribution of computers, manufacture and distribution of musical instruments, photographic and cinematographic equipment
Other copyright industries	Industries whose operations are related to production, distribution or use of copyrighted works. Part of industry's output is copyright related. Industries that would be moderately smaller without copyrighted works and other subject matter.	Jewellery, furniture, household china and glass, clothing and footwear, toys and games, wallcoverings and carpets, engineering.

The industries in which activities and production partially depend on copyrighted works and other subject matter are called "other copyright industries". Copyrighted works and other subject matter generate, to a varying degree, part of the production value of these industries.[2]

Classifications similar to these have been used in the studies of the economic importance of copyright. All the studies identify core copyright industries and

[1]The World Intellectual Property Organisation has now begun to call these Interdependent Industries (World Intellectual Property Organisation, 2003). For the purposes of this article, which reviews previous measurements and assessments, the authors utilise the copyright-dependent term because its relational nature to core copyright activities was recognised in most previous studies.

[2]New WIPO definitions (World Intellectual Property Organisation, 2003) divide other industries into two categories: partial copyright industries (including furnishings, fabrics, wall paper which have some copyright materials) and non-dedicated support industries (such as trucking and retailing). In practice the contributions of these industries are nearly impossible to fix with any precision and, because they were excluded from most past studies, the authors use the more common "other" category for this article.

present the figures of the core copyright industries as the primary way of measuring the economic impact of copyright. The sub-branches included in the core copyright industry category, however, have varied to some degree in the different studies, as will be discussed later.

When the economic value of copyright is established and understood, policy makers and those producing copyrighted materials can effectively create legal and industrial development policies that promote the industries producing copyrights, protect the value of copyrighted material after its creation, and continue to support the transition from industrial to information society.

2. Why Measure Copyright Value

Copyright is a limited monopoly provided by law to specified works. These works are the product of original creative activity by their creators (Takki, 1999). The purpose of copyright is to protect the work and create more innovation and economic value, as well as an incentive to produce a socially optimal number of works. The absence of copyright produces less wealth in societies than the existence of copyright (Richardson, Gans, Frances, Hanks, & Williams, 2000).

Copyright enforcement provisions are designed to stem the loss of economic value from theft, infringement, and piracy of copyrighted works. The amount of loss and effects of unauthorized uses varies among copyright sectors (Picard, 2004). There is a trade-off between copyright protection and the total amount of wealth created through copyrighted works. The total value created by copyrighted works increases as the protection increases from zero. However, as the protection increases, there is a point beyond which the total wealth produced by copyright begins to decrease. This occurs because as the level of protection increases, costs of enforcement and consumption rise. At some point market failure occurs in the form of increased piracy and decreasing demand for copyrighted works.

From the economic standpoint, the objective of policy makers is to achieve the optimal point at which the maximum amount of wealth is created by copyright. The challenge is that optimal conditions are contingent on and a function of a number of changing social conditions, therefore no stable point of optimal copyright policies can be identified and maintained.

One way to approach the problem of achieving optimal levels of copyright protection is to analyse the economic impact of copyright industries. This type of measurement is also useful to determine the need for and outcomes of development policies designed to encourage economic growth and wealth generation through the industries that produce copyrightable materials.

3. Means of Measuring Economic Impact

There are a variety of types of indicators of economic impact for industries and enterprises. These include measurements of turnover, employment provided, wealth generation (value added), contributions to gross domestic product and gross national product, increase in overall productivity, exports, and multiplier effects. The purpose of a particular impact study determines which indicators are appropriately employed.

Measuring the impact of economic sectors is important because policy aspects of neoclassical economics focus on how use of resources produces economic benefit to society. National economic policies in market economies focus on creating growth in

the economy, and the use of sectoral indicators help explain what industries add to the economy. This is typically done by focusing on the value added to the economy, that is, the increase in wealth resulting from the activity.

In recent years a number of studies have documented the economic impact of copyright on national economies. These studies have shown that the production value of industries based on copyrights exceeds that of many traditional industries in some nations and that, in several countries, copyrighted works have also become important means of producing export income (Hummel, 1989; Scheuch & Holzmüller, 1989; Price, 1989; Esala & Manni-Loukola, 1991; SEO, 1997; Siwek, 2000; Allen Consulting Group, 2001; Media Group, 2000; Media Group, 2002; Media Group, 2003). Despite the importance of copyright the full value of copyright to national economies has only been calculated in a few nations. Regular assessment of that value occurs only in the United States. The most expansive study undertaken to date is an assessment of the value of copyright in the 15 EU nations, which determined that the copyright industries in 2000 contributed more than 1.2 billion euros in turnover and added value of 450 billion euros to the EU economy while employing 5.2 million persons (Media Group, 2003).

Comparative studies of the importance of copyright in national economies are desirable; however, existing studies have used different methods for assessing the impact of the copyright industries. These differences limit comparability and need to be clearly understood. Later in this article the authors will review and compare the methods used to assess the value of industries based on copyrights and the implications of the differences.

3.1. **Data Issues in Measuring Impact.** Data on industries worldwide are based on national account statistics and, although there are continual efforts to standardise data, there are a great deal of national differences in the amount of data and specificity of data available. As statistics developed during the industrial age, nations focused their greatest efforts on producing data about specific industries that played important roles in their national economies. Although data on other industries was also collected and provided, the categories under which activities were recorded and the amount of data varied widely.

Historically, copyright industries have been recognised for their cultural, social, and political contributions to society. Research and policies have tended to focus on those functions. Although there has been some recognition of economic impact, the central economic activities in copyright content creation and dissemination were traditionally not given significant attention by policymakers or national statistical agencies.

As a result of this context of data collection, data availability on industries based on copyright has lagged behind those of many industries and only low levels of industrial data are often available about these industries. It is not unusual for national account statistics to have far more data with much greater specificity about agriculture, fishing, leather, textile, automobiles, chemical, and metal industries than about copyright industries.

The problems surrounding the availability of data on these industries have gained increased notice in recent years. A recent EC report on publishing industries, for example, noted that "official data sources are currently of limited use in gathering publishing industry data. Few useful categories of data are employed for the publishing industries. When data are reported, they often contain gaps. Even

when data are available, they are rarely directly comparable because of significant national differences in how data are recorded and what is included" (European Commission, 2000, p. 68).

A special report on printing and publishing industries was produced by Eurostat recently to supplement its basic data and its Panorama of European Business (Eurostat, 2001). It was based on Eurostat data, the New Cronos database, other European statistics, and material from industry associations. It also noted gaps in reported data for many nations and problems with data on small − and medium − sized enterprises that make up the bulk of firms in media and communications.

Much of the data regarding industries based on copyrights also involves cultural statistics, and their insufficiency has been recognised for a number of years. The Council of European Ministers for Culture in 1995 passed a resolution urging improvement of statistics, and after national research and experimental data gathering, Eurostat established a working group on cultural statistics in 2000. Work is currently underway to create common definitions and data methods that will improve statistics in the future.

Jeannie Cardona, head of the statistics unit for the French Ministry of Culture and a member of the working group on cultural statistics, noted in 2002 that improvement of cultural statistics "greatly depends upon the capacity and willingness of National Statistical Institutes to provide sufficiently detailed data. There is one major obstacle to the pursuance of work given the uncertainty that reigns over the classification of cultural activities in the 2007 revised version of the NACE [Nomenclature de Activités économiques de la Communauté Européenne] currently underway" (Cordona, 2002, p. 21).

Data problems have also been recognised in the audio-visual industry. A recent report for the European Commission's Directorate General Education and Culture reported that "the national and European statistical instruments relating to the cinema industry, with a few rare exceptions, are inadequate or inappropriate in nearly all countries. The only reliable indication available at the European level is the number of cinema admissions" (European Commission, 2001, p.1).

These kinds of issues create significant challenges in compiling European-much less global-data on copyright industries and there are additional gaps and difficulties regarding employment statistics and value added. Even when cross-national data are available from statistical sources, the dates of the data often vary widely because some national statistical offices are slower in collecting and processing data or because it is not compiled annually.

The primary general sources of European economic data are Eurostat and national statistical offices that contribute to its work. Their data collection and reporting activities employ the NACE system of classification. The data are developed within the national accounts systems and statistical directives provide considerable flexibility to national statistics offices in gathering and reporting data.

NACE data often are reported within broad categories that co-mingle activities. Despite efforts to harmonise statistics, not all European nations use the NACE categories similarly. Even when data is available, they are often not rigorous because many copyright industries have traditionally been considered to be cultural rather than economic activities and only limited economic statistics have been gathered, or they have been gathered in broader categories that include a variety of activities that make the data inappropriate for assessing economic impact.

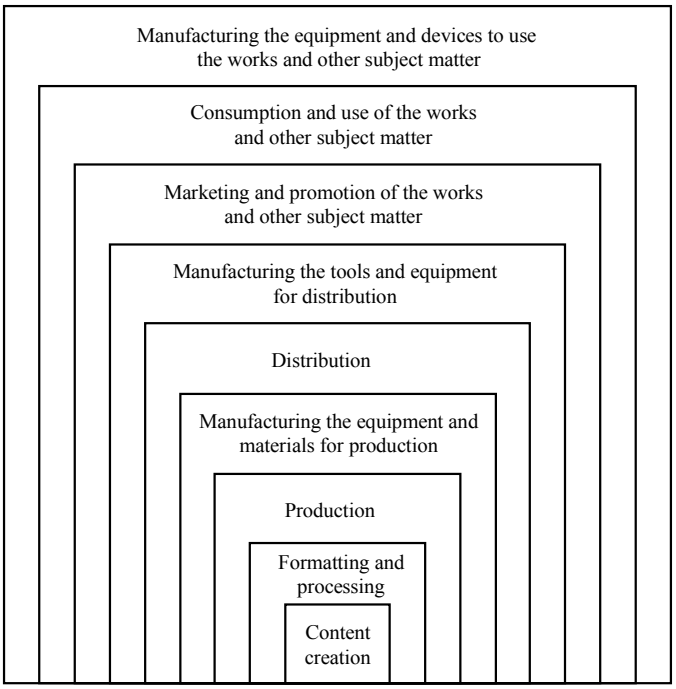

FIGURE 1. Layers of Economic Activities Related to the Production, Packaging and Distribution of Material Protected by Copyright and Related Rights

4. Economic Activities Covered by Copyright

The creation of copyrighted works and materials constitutes only a starting point for the economic impact of the copyright. After their creation, the works are modified, packaged, reproduced, and distributed to the consumers. Layers of economic activities are involved between development of an original idea and consumption, as illustrated in Figure 1. Copyrighted works radiate their effects throughout the economy when they are produced, distributed, and used.

An example of the radiating effects can be seen in the case of publishing books on economics. Activities begin with the author creating a manuscript and the effects radiate outward, creating economic activity involving the publisher, printing firm, distribution chain, marketing, and consumption of the book, as illustrated in Figure 2. Because books are physical products that do not require hardware for use, they do not have an effect on the manufacturing of equipment and devices (such as television sets manufacturing that is a requirement for reception of copyrighted television programme content), unless the content is published as an electronic book and some sort of electronic book reading device is required.

Activities related to production, distribution, and use of copyrighted works and matter thus differ by type of content. Although these differences produce separate value chains, the economic measurement techniques employed are similar.

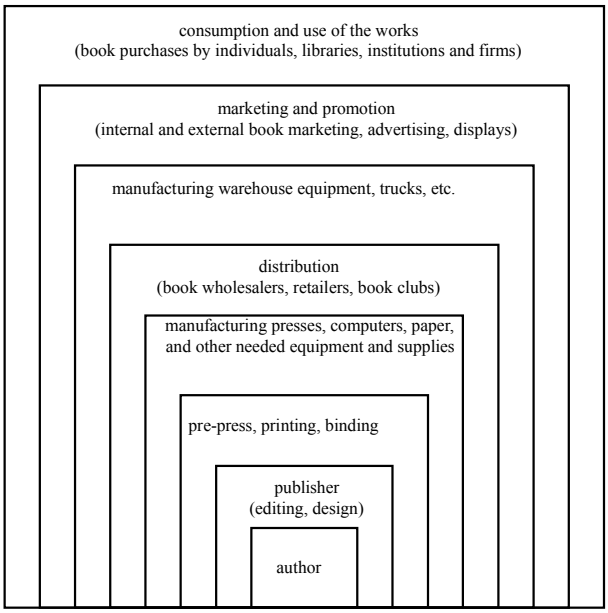

FIGURE 2. Example of the Radiating Effect of Economic Book Publishing

5. The measurement of the contribution of copyright in national economies

As noted above, there are multiple ways of assessing the size and importance of an industry. The number of employees in an industry and its share of the total workforce, for example, can be used as a justification for public support or industrial development efforts. Turnover of an industry can be used to point out its importance in the economy. Turnover, however, measures the gross output of an industry, including inputs from other industries in a way that results in duplication and skewing of the results.

As a result, in assessing the economic importance of industries, the most common measurement is value added or gross value added (GVA). Value added measures the contribution of a particular industry to a good or a service. It is defined as turnover (or production value) less the cost of all inputs from other industries. The sum of the GVA of all industries equals GDP.

The use of value added in economic impact studies provides a useful indicator of the wealth that an industry adds to the economy.

The major studies on copyright industries worldwide have used generally similar approaches based on the identification and classification of copyright industries and calculation of their value added. In some studies turnover (revenues), number of employees, and exports have also been assessed.

Measurement and comparability become more complex as the number of elements measured increases. Challenges associated with this issue quickly become obvious when one reviews existing copyright studies, in which some differences appear in the industries that are regarded as core copyright and copyright-dependent industries and the statistics that are available from national statistics institutes.

Ideally, longitudinal data should be available to assess the development of copyright industries' contributions to the economy, but it is absent in many studies.

5.1. **Issues in Methods of Measurement.**

5.1.1. *Value creation.* A majority of the existing studies on the importance of copyright industries broadly adopt the same basic method for measuring value creation. Their point of departure is gross domestic product (GDP), which measures the total annual output of goods and services produced by the residents of a particular country in a given year. GDP includes exports but excludes property income from abroad.

When property income from abroad is added to GDP, the result is gross national product (GNP). Gross domestic product and GNP include the output of capital goods, but these measures overstate the value of resources unless a deduction is made for depreciation of existing assets. Depreciation is, however, to some extent arbitrary and therefore hard to measure. GNP and GDP are therefore normally used as measures of the economy's output. They are measured at factor cost, excluding taxes. Gross domestic product has been chosen in all previous studies on the national impact of copyright as the figure against which the copyright industries' value creation are measured.

In assessing an industry's value creation, gross output can be used to measure the industry's value of sales in a year, adjusted for changes in stock. It is normally measured at wholesale prices. Gross output of an industry, however, overestimates an industry's contribution to national income because it includes the value of inputs produced by other industries. As a result, gross value added (GVA) is used to represent the true contribution to the national economy. It is the value of gross outputs less the value of inputs from other industries.[3]

5.1.2. *Employment.* Another widely used method to assess the economic importance of industries based on copyright is measuring the number of persons employed. These figures should include persons employed by firms in the copyright industries as well as self-employed persons who play significant roles. Economic importance is expressed as the proportion of total employment in the economy provided by the industries.

Assessment of industry employment is problematic, however, because statistical data in most nations do not make distinctions between full-time and part-time labour or reported full-time person years that adjusts for part-time employment.

5.1.3. *Trade balance.* Some studies on copyright impact have included the foreign trade of copyrighted material. Some studies included only the export of copyrighted material (for example, Siwek & Mosteller, 1999); others count the trade balance for copyright and copyright-dependent industries respectively (see, for example, Allen Consulting Group, 2001).

[3]An Australian copyright impact study (2001) uses a somewhat different term for the value created in industries. Industry value added represents the value added by an industry to the intermediate inputs used by that industry. From 1997-98, IVA has replaced industrial gross product (IGP) as the official measure of the contribution by industries to GDP.

6. Comparability of Research

6.1. **Problems of Comparability.** The most common way of studying the economic contribution of industries based on copyright to the national economy is to calculate the value created by the industries and to measure it against GDP or the number of employees against the total workforce. The data required for the comparison is acquired from national statistical institutes. This method has some shortcomings. First, statistical categories include all activities and employees within the selected industries, even those whose work is not copyright-related. The share of non-copyright work varies between sub-branches of the relevant industries and also between the individual businesses in a given sub-branch.

The mirror problem is that industries included in assessment typically exclude copyright-related activities that are not in the core or dependent categories. A small portion of value created in such industries as furniture, clothing, and engineering is derived from copyrightable matter, but the value is not segregated in national statistics.

Among the most important hindrances to good international comparability of the economic contributions of copyright to national economies are differences in national statistics gathered and published. A notable problem is that there are 'blanks' in national statistics. Existing studies have tried to solve this problem either by making sample analyses or other kinds of estimation methods. The former consumes a great deal time and money and the latter poses reliability issues. Even if problems of available national data and differences in counting indicators were solved, internal problems of the actual contribution of copyright to the value added in different industries based on copyright remains unsolved.

Table 2: Methods Used in Major Studies (year indicates data year)

	Value creation	**Employment**	**Foreign trade**
Austria 1986	Value added/GDP	n^{o}employees	no
Finland 1988	Value added/GDP	n^{o}employees	export, import of copyrighted works and copyright fees
UK 1990	Gross value added/GDP	n^{o}employees	no
Finland 1997	Value added/GDP	n^{o}employees	no
USA 1997	Value added/GDP	n^{o}employees	export of copyrighted works
Norway 1999	Value added/GDP	n^{o}employees	no
Australia 2000	IGP/GDP	n^{o}employees	export, import of copyrighted works and copyright fees
EU 2000	Value added/GDP	n^{o}employees	no

The Finnish copyright impact study (Media Group, 2001) suggested that a better method for assessing the true value of copyright would be a value chain analysis that actually measures the economic impact of copyright rather than impact of copyright industries. Such analyses would also reveal the parties involved in the process of creating, producing, and distributing copyrighted works. Such a value

chain analysis has a practical problem, however. It is much more difficult and time consuming to carry out than the national statistics-based methods.

6.2. **Differences in Methods Employed in Existing Studies.** The major existing studies of the impact of copyright have employed different means in making their assessments. The differences in what has been measured and how it is measured are evident, as shown in Table 2.

The comparability issue is also evident when one considers which industries were included in the core copyright industries in the assessments of those studies (Table 3a and Table 3b).

Table 3a: Activitites included in the Core Copyright Industries in Major Studies (year indicates data year)

	EU 2000	Australia 2000	Norway 1999	USA 1997	Finland 1997	NL 1994	UK 1990	Austria 1986
press and literature	*	*	*	*	*	*	*	*
music	*	*	*	*	*	*	*	*
theatre and opera	*	*	*	*	*	*	*	*
film and video	*	*	*	*	*	*	*	*
photography	*		*		*	*		*
visual arts	*		*		*	*		*
radio and TV	*	*	*	*	*	*	*	*
software and databases	*	*	*	*	*	*	*	
architecture			*		*	*		
advertising	*		*	*	*	*		
industrial design			*		*	*		*
research			*		*	*		
copyright societies						*	*	*

7. Lessons From Personal Experience

After conducting economic assessments of copyright in more nearly 20 nations, the authors have learned a number of practical lessons about processes and procedures during copyright impact studies that may be useful to others:

- Statistical offices often do not know what data they have about copyright industries. This occurs because they typically have not regularly produced individual reports on many of the industries involved and because of unique ways in which many compile and make raw data available.

Table 3b: Activities Included in Other Copyright Industries in Major Studies (year indicates data year)								
	EU 2000	Australia 2000	Norway 1999	USA 1997	Finland 1997	NL 1994	UK 1990	Austria 1986
photography				*			*	
architecture		*		*			*	
advertising		*					*	
research		*		*				
consumer electronics	*		*	*	*		*	
computers	*	*	*	*	*			
musical instruments	*		*		*		*	
photographic and cinematographic instruments	*	*	*		*		*	
jewellery and coins				*			*	
furniture				*			*	
household china and glass				*			*	
clothing, textiles and footwear				*			*	
toys and games		*		*			*	
wallcoverings and carpets				*			*	
engineering and motor parts							*	
transport (railroad, road, air and water)				*				
wholesale and retail				*				

- Because of the manufacturing focus of account statistics, data on copyright industries involving manufacturing (book printing, CD manufacturing, etc.) tend to be more extensive and discrete than data for copyright industries that tend to be services or more culturally based activities (motion picture production, graphic design, photography).
- In assessing impact, one cannot rely merely upon published data because it often contains large gaps. This is particularly true of cross-national data

sources where gaps sometimes exist not because of unavailable data but because it is not directly comparable. Finding ways to segregate, re-categorise, and harmonise data create challenges to researchers.

- Cultural statistics tend to report culturally oriented data rather than economically oriented data that is useful for such studies.
- Direct contact, discussions, and suggestions of data searching techniques are often necessary to obtain data from official national and international statistics offices. This occurs because much data is not readily available in online and published data sources, is incomplete, or does not appropriately segregate needed information.
- Statistical sources rarely provide you the data as rapidly as you wish to receive it.
- Online data sources and their use is becoming much easier than in previous years and is permitting more comparison among national industries.
- In addition to standard statistical sources, ministries of culture, industry, and communications often have reports containing data that are not available elsewhere.
- In some cases where statistical office data is weak, better data can be obtained from industry associations and federations. Care must be taken with the data, however, because it is often developed from the membership of these organisations and may exclude significant portions of the sector involved.
- Some officials express disbelief in the results. This occurs primarily because industry representatives from some sectors are more vocal and engage in greater lobbying than other sectors, leading officials to believe those sectors are more important economically. In recent years, for example, the recording industry has been particularly active relative to piracy and uncompensated downloading. This has led some officials to come to the opinion that it is a large contributor to national economic value, but its contributions are far behind those of the less visible printing and publishing sectors.

8. Conclusions

Purposes, uses, and protections of copyright are widely discussed themes in national and international policy making. Because the goal of policy makers is to enhance the creation and consumption of protected works and to discourage piracy, efficient means of evaluating the outcomes of these policies are needed. Developments in the economic contributions of copyright-based industries are a fairly good indication of success or failure of copyright policies. As a result there is increasingly a need for comparable and transparent methods for assessing the economic importance of copyright.

The different methods used in all existing studies have both strengths and weaknesses. If useful cross-national comparisons are to be made, it is imperative that studies measure the same things in the same way. This still will not solve the problem of differences due to the variety of data counting methods in national statistics, but it will provide a clearer comparative basis than exists today.

The World Intellectual Property Organisation convened an expert working group to help prepare guidelines for surveying the economic importance of the copyright

industries and it published those guidelines late last year (World Intellectual Property Organisation, 2003). They are expected to help standardise national studies in the future to improve comparability for results and performance.

The WIPO handbook clearly identifies functional and statistical distinctions regarding copyright, delineates the differences in the value creation processes of various copyright industries, and divides the economic contributions of the industries into four types: core copyright industries, interdependent industries, partial copyright industries, and non-dedicated support industries. These approaches thus help improve understanding of various industries involving copyright and address some of the past limitations in studies made by different parties as developments of the techniques for measuring economic impact of copyright developed.

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