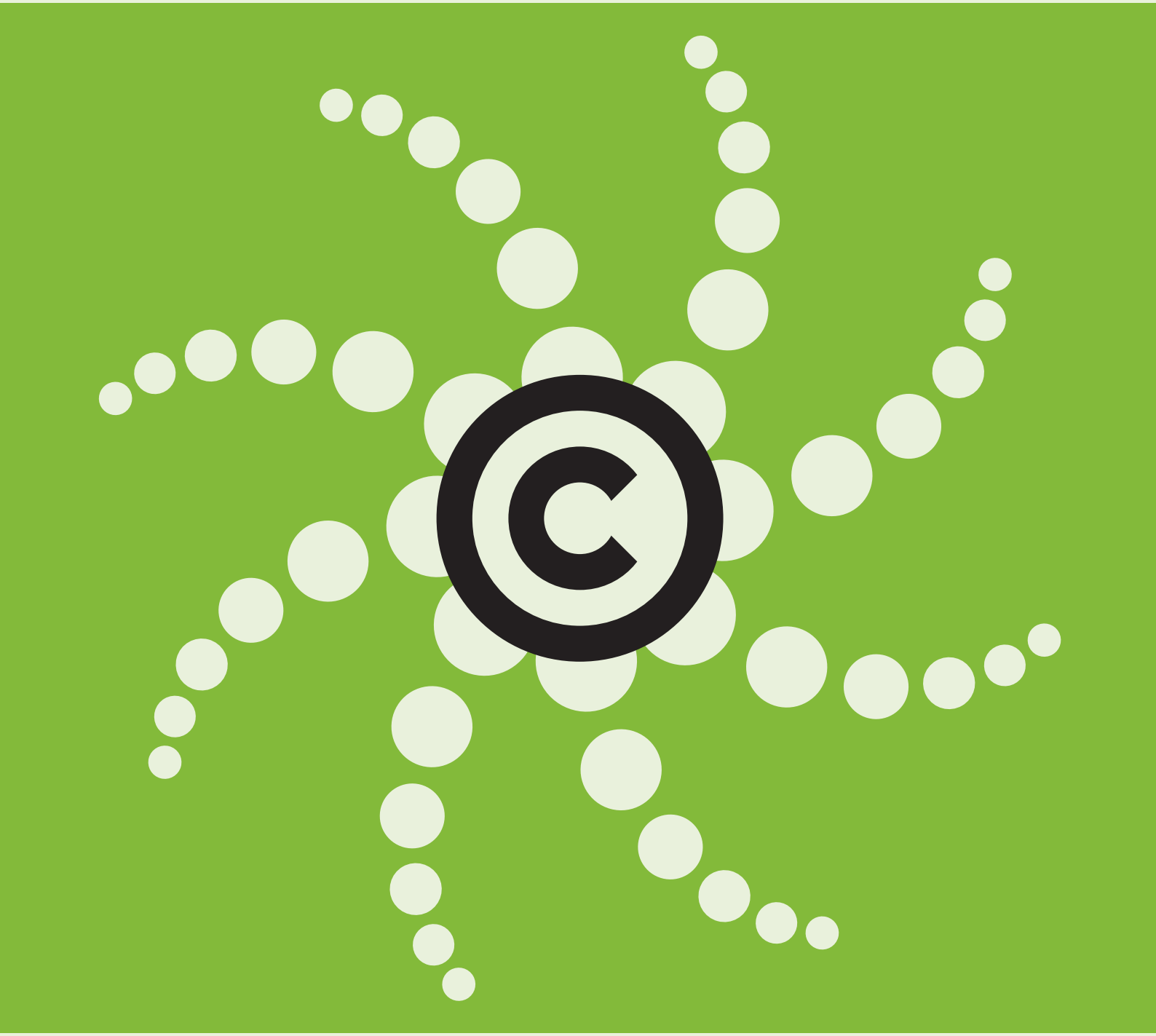
Petteri Sinervo – Timo E. Toivonen

THE CAPITAL VALUE OF COPYRIGHT ASSETS IN FINLAND



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The Capital Value of Copyright Assets in Finland

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F©S Articles and Studies No 1 – April 2012

Cuporen verkkojulkaisuja 11

THE CAPITAL VALUE OF COPYRIGHT ASSETS IN FINLAND

This pilot study was carried out at Business and Innovation Development (BID), a special unit operating within the University of Turku, and prepared by Mr Petteri Sinervo, Development Manager, and Mr Timo E. Toivonen, Researcher. It was commissioned by Foundation for Cultural Policy Research Cupore as a contribution to a larger project for establishing a methodology for a systematic assessment of the copyright and related rights system. Finnish Copyright Society offers its publications platform for this joint publication.

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Established 1965

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Foundation for Cultural Policy Research Cupore

ISBN 978-952-5573-38-1
ISSN 1796-9263
Cuporen verkkojulkaisuja 11

Graphic design: Petteri Lehtinen

ISSN 1799-8166

F©S Articles and Studies No 1 – April 2012

Contents

Foreword

In May 2009 Foundation for Cultural Policy Research (Cupore) established a project for developing a methodology for assessing national copyright and related rights systems.

The objective of the project is to form a set of evaluation methods for developing copyright and related rights policies and strategies, as well as the copyright and related rights system on the national and international level. The project is financed by the Finnish Ministry of Education and Culture.

During the methodology project, additional topics for further study were identified, one of them being the evaluation of the value of national copyright assets.

Cupore commissioned this pilot study in cooperation with the Finnish Copyright Society from Business and Innovation Development (BID), a special unit operating within the University of Turku. The assignment was to identify and describe briefly the possible methods for evaluating the capital value of copyright assets, and to apply the most feasible of them to make an estimation of the national copyright assets in Finland. The study was prepared by Petteri Sinervo and Timo E. Toivonen. Cupore and the Finnish Copyright Society would like to thank the authors.

The analysis of the capital value of copyright assets adds to the understanding of the copyright system´s functioning. The pilot study at hand concentrates on the repertoire which is in active use and estimates the capital value of copyrighted works for companies. It offers information complementary to the figures of contribution of copyright-based industries to the national GDP. It also complements the evaluation of direct copyright revenue streams made by Tarja Koskinen-Olsson, published in the Finnish Copyright Institute's series of publications in 2010.

Yet, alternative approaches need to be considered to analyze the asset value of protected subject matter that is not in active use or creating money flows, and the value of works in the public domain.

Measuring the value of these two categories of works will be subject to important choices of approach. One should examine whether it is the cost (production value) approach, the potential future value in revenue, or e.g. the cultural or historical value of these works, that matters.

Jukka Liedes
Director
Ministry of Education and Culture

1. Introduction

Intangible assets form an increasingly important part of valuable assets in the economic life. More and more often the success factors and income generators of companies, other organisations as well as nations, are intangible in nature. Knowing the value of intellectual property is useful from the governmental or public point of view. Understanding the value of a nation's intangible assets assists and facilitates the efficient allocation of resources and designing of effective economic policy. Knowing the value of the intangible assets is also important for individuals and private organisations. For some individuals, like artists, authors, performers and other right holders, the valuation can be the basis of one's income requirements.

Intangible assets consist of material protected by intellectual property rights and unprotected materials. Many scholars have addressed the issue of measuring or reporting all the intangible assets of one organisation (for example, Sveiby 1997, Roos & Roos 1997, Edvinsson 1998, Lev 2001). The models developed classify, categorise and list items and indicators of intellectual capital. While some models provide links to the organisations' monetary reporting, they do not exactly aim to calculate the monetary value of intangible assets or intellectual capital. They mainly serve as tools for the management to efficiently employ and use the intellectual capital of an organisation. The valuation of all intangible assets may not be possible, but there are methods to value some parts of it. Over the time methods have been developed to value intellectual property rights, which form an important part of intangible assets.

Intellectual property rights give the owner an exclusive right to decide upon the use and exploitation of the subject matter. Intellectual property refers to the creations of the human mind. The legal system of intellectual property rights converts this innovative and creative output into property and thus into valuable tradable assets (WIPO 2005). The growing role of IP based assets in generating new value poses a number of major challenges for the corporate sector, governments, and the society at large: how to evaluate the value and contribution of IP and how to maximise its potential (ip4inno 2008).

Intellectual property rights are typically divided into two groups: industrial property rights, which include rights like patents, trademarks, utility models, design and trade name, and copyright and related (or neighbouring) rights. This study concentrates solely on the copyright sector of intellectual property rights. This study has two purposes. Firstly, to develop a methodology to estimate the capital value of copyright assets[1] on country level. The existing valuation models are designed to value a single subject matter and a method to calculate a nation's total "wealth of copyrighted works" appears to be missing. The methodology to be adopted must be simple enough so that it can be applied with reasonable efforts and work load. Secondly, this study aims to apply the developed methodology in Finland and estimate the capital value of the copyright assets in Finland.

[1] In this study the term copyright is used to cover both the actual copyright and the related or neighbouring rights.

The materials protected by copyright obviously have significant artistic and cultural value. One can even say that the copyrighted works form the backbone of a nation's cultural heritage. This value, however, cannot be converted or calculated in monetary terms. This study focuses solely on the commercial value attached to copyrighted works. The large, non-monetary impact that copyrighted works have on the welfare of a society or the importance of the materials protected by copyright in cultural and artistic life are outside the scope of this study.

This preliminary study is commissioned by Cupore, Foundation for Cultural Policy Research, in the context of a broader project which aims at establishing a methodology for the assessment of copyright and related rights systems. The objective of the project is to form a set of evaluation methods that are applicable in the formulation of copyright and related rights policies and strategies, and in developing a copyright and related rights system on the national and international level. The project is financed by the Finnish Ministry of Education and Culture.

2. Research on the economic aspects of copyright

2.1 Methods to estimate the economic impact of copyright-based industries

The first studies on the economic importance of copyright were published in the 1970s and since then studies have been carried out in several countries. Currently, over 30 countries around the world have engaged in surveying the economic contribution of copyright-based industries in their country. The methodology used in these studies has been very similar in each country. The basic idea is to identify the industries that are related to or dependent on copyright, and then to calculate the contribution of those industries to the value-added and employment aspects of the economy. In 2003 the World Intellectual Property Organization (WIPO) published The WIPO Guide on Surveying the Economic Contribution of the Copyright-Based Industries. The methodology defined in the WIPO Guide has been widely adopted and can nowadays be regarded as the standard for researching the economic contribution of copyright-based industries.

The WIPO methodology relies on the statistical data provided by the national or international statistical organisations. The aim is to survey the economic contribution of copyright-based industries and to provide quantifiable characteristics for this contribution. The methodology addresses the three main indicators of the size of these industries – the value added generated by them, their share in employment, and their contribution to foreign trade. The research does not directly address the economic importance of the material protected by copyright but the industries exploiting the copyrighted materials. When studying the economic contribution of copyright-based industries, the overall goal is, obviously, to reveal the share of these industries of the economic activities in the country in question. The latest study in Finland shows that in 2008 the value added of the core copyright industries was 3,70 % of the Finnish GDP and the industries employed 4,06 % of the work force. The total contribution of all copyright-based industries was 4,73 % of GPD and 5,12 % of the work force employed (Grönlund et al. 2010).

The WIPO methodology does not aim to calculate the monetary value of the copyright assets. Thus it is not suitable for the purposes of this study. However, the WIPO Guide is beneficial for this study in one way. It arranges the copyright-based industries into four categories according to the extent to which their activities are based on copyright, namely core copyright industries, the interdependent copyright industries, the partial copyright industries and the non-dedicated support industries. This categorisation is useful in carrying out this study.

The WIPO methodology is not the only method available to study the economic impact of copyright industries. Sinervo and Picard (2000) suggested the value chain analysis as an alternative method to analyse the economic contribution of copyright. This method measures the economic impact of the copyrighted works rather the copyright industries. It would reveal the parties involved in the creation, production and distribution process of copyrighted works and the values

created in different phases of the process. The possibilities of the value chain analysis were introduced by Porter (1985), and it has become a standard method to analyse business sectors and industries (for example Scott 1998, Karlöf 1989). Value chain analysis presents business activities or functions in a chain in which each phase follows the previous one and adds value in the process. Value chain analysis would reveal the value related to each function in the process. Thus it would provide information about the value of creation of copyrighted works, production of them and distribution of the works in all industries, not only those traditionally listed as copyright-based. Aku Alanen (2004) has applied the value chain analysis to some cultural industries. In his study Alanen divided the industries into five groups (art, mass media, design, advertising and entertainment industry). He concluded that the share of the selected industries of the Finnish GDP was around 4% in 1995-2003.

Value chain analysis has one obvious weakness: it requires detailed company or individual level data. Such data is hardly ever available in the official statistics. It is practically impossible to gather the required data from all involved companies and individuals. A possible way to exploit value chain analysis could be by using sample groups and apply the results to the whole industry sector. Value chain analysis would add value to the WIPO methodology by emphasising more the materials protected by copyright rather than the industries exploiting the copyrighted materials. However, it still aims to reveal the economic contribution of copyright and it does not calculate the monetary value of the copyright assets. Therefore the value chain analysis is not applicable for the purposes of this study.

In addition to the WIPO methodology and value chain analysis some other methods have been proposed to study the economic contribution of copyright. For example, Watt (2004) when criticising the WIPO methodology, proposed a method of multiplying the value added of the core copyright-based industries by a factor presenting the value added of the non-core copyright industries. This method is simple but it includes some "thumb rules" and estimations when selecting the multiplying factor. And, actually, the method owes a lot to the previous studies made using the WIPO methodology because without these previous studies the generation of the multiplying factors would be practically impossible.

Concerning the research related to the economic contribution of copyright or copyright industries one can conclude that they are not fitted for the purposes of this study. They do, however, provide valuable assistance by categorising the copyright industries which are useful when calculating the monetary value of copyrighted materials.

2.2. Valuation of intellectual property

Methods used to value intellectual property can be divided into two groups, quantitative and qualitative methods. Qualitative methods typically provide assistance in valuing an IP through the rating and scoring of IP based on factors which can influence the value. The usefulness and value of the IP in question is assessed using rating or scoring. Qualitative methods do not calculate or estimate the value in exact monetary terms and therefore do not fit to the purpose of this study.

The value of a material protected by copyright means the amount of money representing all future benefits available to the property owner at a particular point in time (Corbin 2008). Research, especially in the field of accounting, has produced a set of well-established models for valuing intellectual property. Traditionally, there are three main quantitative approaches which attempt to calculate the monetary value of intellectual property (Smith – Parr 2000). These are cost, market and income approaches and they are briefly described below.

Cost approach

Cost based approaches measure the value of IP through the calculation of the costs incurred, if the company were to develop a similar asset either in-house or externally. In other words the approach seeks to measure the future benefits of the intellectual property in question by calculating the amount of money that would be needed to replace that protected material. The costs to reproduce or replace the IPR are taken as its value. The cost method has three variations based on the ways the costs are calculated. The historic cost approach measures the costs incurred in the development of the intellectual property, at the time it was developed. The replication cost approach measures the amount of investment required at the present time to develop similar intellectual property. The replication approach assumes that the development work is done exactly the same way and using exactly the same technology as was done at the time of initially producing protected subject matter in question. It further assumes that all work phases are carried out in similar manner and no learning from the mistakes has taken place. The total costs of all work must be included in this calculation, including the costs of unsuccessful development phases.

The replacement cost approach measures the amount of money needed to acquire intellectual property with similar utility. In other words the approach measures the money needed to develop the IP as it currently exists. In the replacement cost calculations the costs of failed and unsuccessful research are not included. All relevant technological developments are taken into consideration when replacement costs are calculated. The cost approach does not directly consider the amount of economic benefits that can be achieved by exploiting the IP asset or the time period over which they might continue.

It is an inherent assumption with cost-based approach that economic benefits indeed exist and are of sufficient amount to justify the developmental expenditures (Parr 1998). The advantage of the cost based method is that it is relatively simple. However, it has several disadvantages. The main shortcoming is that there is no actual correlation between the cost of development and the future revenue potential of an IP asset. Just assuming that the intellectual property must have the adequate future benefits to justify the production costs is not convincing to substantiate the value. Some work protected by copyright may have been expensive to produce but it generates very little income to its owner or to society (such work can, however, possess important cultural or artistic values). On the other hand, some other copyrighted work, which is several years or decades old and which has been already written off, can still generate considerable income. For example, this is the case with some film, music and literary classics.

The cost based approaches have rather limited use in practice. It is commonly stated that cost based methods are only useful for bookkeeping and accounting purposes in accordance with

accounting rules. Additionally, they are sometimes applicable for taxation purposes. It is also suggested that cost method could be used or as a supplement to an income approach (WIPO 2003), but, in practice, cases in which such use might be meaningful are very rare. However, the cost-based approach does not require that the copyright or other IP asset in question is in active use. Therefore it can be used also with subject matters which are currently not exploited, that is to say the "sleeping" part of the materials protected by copyright.

Market approach

The market approach seeks to obtain a consensus of what others in the marketplace have judged the value of comparable intellectual property to be. The underlying assumption of market based methods is in the core of the idea of market economy: the price of any commodity is set in the market between a willing buyer and seller. The value of intellectual property is derived by comparing the prices achieved in recent comparable or similar IP transactions between independent parties. The idea behind these approaches is that the market decides the accurate price and therefore the value of the intellectual property. Three main methods to establish the market prices are auctions, comparable market prices, and comparable royalty rate methods.

The auction method assumes that the price is set in a perfect auction with many potential buyers with perfect information about all aspects of the intellectual property in question. The value of the IP is determined by the price reached through bidding. Under the comparable market price method the value of the intellectual property is determined by reference to the prices obtained for comparable intellectual property in transactions between independent parties. Market based valuation methods may also be based on the comparison of royalty rates used when licensing similar IP. Many sectors often use industry averages as a basis for setting royalty rates in license agreements or in establishing damages in litigation. The value of the IP is given through the comparison of the subject IP with the royalty rates in similar license agreements.

The market approach methodology is both credible and objective. It has, however, one major practical shortcoming. The needed market data is scarce. The method requires an active market, a comparable exchange of IP between two independent parties, and sufficient access to transaction price information. The formal markets for intellectual property are limited and the relevant pricing information is not usually public. The use of comparable royalty rates is most widespread, especially for databases and software, and the source of information typically is the licensing agreements. In addition to the practical difficulty in applying the market approach, it also has one theoretical problem. By the very definition of intellectual property right each IPR is unique. In order to receive the legal protection and exclusive rights attached to IPRs the subject matter must be unique. Thus the idea of comparing unique commodities and their prices or values is theoretically dubious. However, many IPRs have similar purpose of use and nearly similar features and, therefore, the comparison for valuing purpose is generally accepted. On the other hand, because each copyright property is unique by definition, the decision of what similar assets to use as benchmarks is essential to the derived value.

Income based methods

The most basic definition of 'value' is based on the ability of an asset to generate future income. The income approach is the one most commonly used for valuing intellectual property because it focuses on the property's capability to generate income. Income based methods measure the potential future benefits of the subject IP in an effort to determine its worth. The valuation is based on the present value of future earnings attributable to the asset or of costs avoided as a result of owning it. There are many income based valuation methods. The one which could be called as the "basic method" is the discounted cash flow (DCF), because many other methods are more or less variations of the DCF.

Discounted Cash Flow (DCF) is the most fundamental and widespread of the income based valuation approaches. The method attempts to determine the value of the IP by calculating the present value of future earnings from the intellectual property, over its useful life. Discounted Cash Flow calculations have three crucial variables to be determined: the earnings to be discounted, the discount rate, and the time span. The time span to be used in the calculations is normally the easiest to solve. The time span can be very different for different property. The maximum amount of time that may be considered is the very long legal life remaining in the copyright (typically, the author's life plus 70 years). Often it is more practical to consider the expected period the property is used and is commercially viable. For example, some computer games have a limited lifetime of popularity before they are overtaken by new games. Quite often in the DCF calculations the exact values are derived only from a limited number of future years (typically between 3 and 7) and the value thereafter is calculated using a so called terminal value calculation.

The earnings to be discounted are relatively simple to calculate or estimate. Calculations can be based on either the historic revenues the property in question has generated or the estimated future earnings. When an intellectual property has generated earnings, the past revenues are useful. Naturally, for the discounted cash flow calculations one has to consider, if the revenue streams are going to stay at the current level, increase, or decrease in the future. In the cases, where past revenue streams are missing or are just started to evolve, the future earnings must be estimated. The estimations are based on both the typical revenue streams of similar kind of IPRs and the specific analysis of the earnings potential of the intellectual property in question.

The third crucial variable in the discounted cash flow calculation is the discount rate. The discount rate reflects the risks related to the IP in question and the required rate of return the owner wishes to receive. The discount rate is often set by using the market data available: what level of return investors require for an investment made to the kind of asset in question. Both the asset-specific features and the typical return rates of the industry where the IP asset is used must be taken into consideration. Sometimes one has to rely on estimates based on experience of the required return rates.

In the company valuation, where the discounted cash flow method is also used, the weighted average cost of capital (WACC) is one practical method to determine the discount rate. The WACC method determines the subject company's actual cost of capital by calculating the weighted average of the company's cost of debt and equity. WACC represents the actual rates of return the investors have received. Another method is Capital Asset Pricing Model (CAPM)[2].

[2] The model was introduced in the 1960s by Jack Treynor, William Sharpe, John Lintner and Jan Mossin, independently. They all based their research on the earlier work of Harry Markowitz on diversification and modern portfolio theory. In 1990 Sharpe, Markowitz and Merton Miller jointly received the Nobel Prize in Economics for this contribution to the field of financial economics.

The CAPM method derives the discount rate by adding a risk premium to the risk-free rate. The risk-free rate is normally set to equal the return rates of governmental bonds. The risk premium represents the returns of diversified investment portfolio. The required rate of return for specific asset (or company) is calculated by multiplying the risk premium with "beta", a coefficient reflecting the risk level of the asset in question compared to the diversified investment. CAPM was developed for the purposes of stock exchange investment. It can, however, give some guidance also in setting the discount rates for intellectual property assets.

Other income based methods include risk adjusted net present value (rNPV), relief from royalty, and real option method. They all are more or less extensions of the DCF method. Risk adjusted net present value method was developed to deal with technical risk during the development of IP assets, for example medicines. To account for risk, the method adjusts the cash flows of each stage of development by fixed probability rates based on established industry indicators. The relief from royalty method measures the royalty that an organisation would have to pay for the IP being valued to a third-party. Relief from royalty thus represents the savings the company earns, when the IP is in its possession. As with other income approaches, the royalty rates are then discounted through an appropriated discount rate. Real option valuation method treats the development and commercialisation of IP as a series of options. As the intellectual property is developed and commercialised, many decisions, like timing of the development, to continue or abandon the development work, direction of development, when to publish the work, to invest more to development etc., must be made. The information to make these decisions is often not available at the time of valuation, but becomes available later. The real options method, using the Black-Scholes mathematical model for the valuation of options, takes into account the flexibility of these future decisions. Real option method requires detailed information about the development process and about the different future scenarios. To apply the method requires complex formulas and calculations and therefore it is not very widely spread.

Calculations of the income based method valuation are very sensitive to the changes of the three variables: income streams, discount rate, and time span. Income approaches to IP valuation are useful, if the following variables are available or can be estimated with satisfactory accuracy: an income stream either from product sales or license of the IP, an estimate of the duration of the IP's useful life and, an understanding of IP specific risk factors affecting the valid discount rate. The income approaches can only be used for the intellectual property which is generating income. In the case of copyright, the approach leaves out the copyrighted works which currently are not in active use. Also the materials protected by copyright, which are owned by public bodies and are not generating calculable income, are outside the scope of the income approach.

The income based methods, especially the discounted cash flow method, are widely used for two reasons. Firstly, the basic assumption than an asset's value is based on its capability to generate income is the fundamental definition of value in general. Secondly, the discounted cash flow method is relatively simple to use. The needed input data, or data supporting the estimates of the inputs, are often available from the organisation's financial statements or other reporting and from the market information. However, the use of DCF nearly always includes some uncertainty and subjective assumptions. Especially, with an IP in early stages of the development it is difficult to estimate the market potential and future cash flows when often no relevant comparable data is available.

3. Methodology of this study

The purpose of this study is to estimate the total capital value of Finnish copyright assets in active use and generating value. Three quantitative approaches to calculate the value of intellectual property rights were introduced in the previous chapter: cost approach, market approach and income approach. The approaches or methods are typically used to value single intellectual property right. The purpose of this study requires that the method is applicable to value a portfolio of IP rights, namely all copyrights in Finland. This study aims to calculate the capital value of the copyright assets. The copyrighted works naturally have significant artistic and cultural value. The researchers do not attempt to include these values into calculations but only focus on the monetary value attached to the copyrighted works. The methodology to study the capital value of copyright assets is presented in this chapter. The chosen methodology has its limitations and some of the copyrighted works are outside of the scope of the methodology. These limitations are described at the end of this chapter

In cost approach the production, replacement or reproduction costs of a copyright are calculated and the outcome is considered to represent the copyright capital value. This method has two weaknesses. Firstly, it is virtually impossible to calculate or even estimate such costs of all the copyrighted works of a nation. Secondly, the costs of creating a copyrighted work by an act of creation tell very little about the copyright's usefulness and thus its commercial value. For these reasons the cost approach is not applicable in this study. The market approach assumes that the value or price of a copyright is set in the market. The value of a copyright is based on the prices of transactions of comparable or similar rights between independent parties. This approach also has some difficulties when it comes to the scope of this study. It may be that there are no transactions between independent parties or that data of such transactions is not available. There is also one theoretical concern. By definition each copyright is unique. Therefore one can argue that transactions of similar copyrights are impossible. Another practical problem is that the market approach, as the cost-based approach, requires that each copyright is valued separately. This is not possible in this study.

After rejecting the cost and market approaches the researchers are left with the income approach. The underlying assumption in the income approach is that any asset's value to its owner is attached to the asset's ability to generate income to the owner. This assumption is easy to accept. An asset that does not generate any revenue is hardly commercially valuable to anyone, although it can naturally be valuable in other ways, for example having important cultural value.

In the income method the future income streams are calculated at the present value. The most widespread and used method is the discounted cash flow method which is also applied in this study. The formula to calculate the future income stream the present value is the following:

$$PV = \frac{A_1}{1+r} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \cdots + \frac{A_n}{(1+r)^n}$$

PV = Present value
A = Nominal value of the annual income stream
r = required rate of return or the employed discount rate

It is not practical (or useful) to include all future years separately to the calculation. The discounted cash flow analysis calculates the value of a copyright (or other IPR) for several years, typically 3-5, based on the historic revenue streams or projected cash flow for the copyright during that period. The terminal value calculation is used to determine the value of the copyright for all years beyond the included years. For example when the discounted cash flow method is used to calculate the first five years separately and then adding the terminal value, the formula is

$$PV = \frac{A_1}{1+r} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \frac{A_4}{(1+r)^4} + \frac{A_5}{(1+r)^5} + \frac{A_5\,(1+g)}{r-g}$$

g=estimated continuous change of revenue streams

To calculate the value separately for some years and then add the terminal value is useful when calculating the value of a single copyright. The future income streams and time frame can be estimated according to the useful economic life left to the copyright in question. In this study the scope is to estimate the total portfolio of the Finnish copyrights. Therefore the time span for the calculation is different from that for a single copyright. New materials protected by copyright are constantly generated and included in the portfolio. On the other hand some old ones cease to be commercially exploitable and they are dropped off from the portfolio. The total portfolio continues to generate income although the copyrights included in it may change. The value of the portfolio of copyrights must be calculated without time limits. In other words, one must calculate the current value of perpetuity. Calculating the current value of perpetuity (a perpetual annuity) formula becomes simple division:

$$PV = \frac{A}{r}$$

PV = Current value
A = Nominal value of the annual income stream
r = required rate of return or the employed discount rate

The challenges of the discounted cash flow methods are to calculate or estimate the revenue streams and to set an appropriate discount rate. The revenue streams can be based on historic data or future projection. In this study it is not possible to estimate the historic revenue streams or future projections for every copyrighted work separately. The income steams to be used in the calculations must be calculated in different manner. A practical way is to base the calculations on the revenue streams of the copyright industries. The value of copyright revenue streams in Finland has been assessed in a recent study (Koskinen-Olsson, 2010) and the findings of the study are used here in assessing the value of the copyright capital in Finland. The study of Koskinen-Olsson on direct copyright revenue streams in Finland is a pioneering work on the value of copyright income. It is based on one hand on the available statistics and on the other hand on the figures

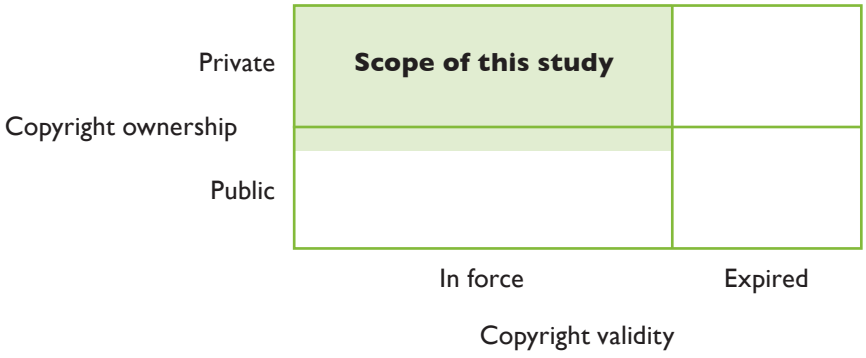
provided by the stakeholders of the copyright sector. It gives a good cross-sectional picture on the value of copyright streams in the sub-branches of the copyright-based industry[3].

The second crucial variable in the discounted cash flow method is the discount rate. The rate must reflect the riskiness of the asset and, thus, the expected or required rate of return. The researchers of this study identified two alternative ways to set the discount rate. The first is based on the historic returns of the stocks listed in the Helsinki stock exchange. The return rate of copyright revenue streams is derived from that return rate by applying the Capital Asset Pricing Method and using the risk premium and coefficient. The second method of estimating the discount rate is applied by calculating the return on capital of the copyright industries included in the calculations. The ways of setting the discount rates are presented in more detail in the following chapters.

This study uses the revenue streams of the copyright industries as the basis of the calculation of the value of copyrighted works in Finland. Revenue streams of privately owned copyrighted works are rather extensively covered in the calculations. But also public sector creates, owns and uses works protected by copyright. Only part of the public sector activities, in which copyrighted works are exploited, generates detectable revenue streams. In this study only this part of the public sector exploitation of the copyrighted works is included in the calculation of copyright revenue. Music, theatre, and opera as well as radio and TV broadcasting generate calculable revenue streams that are included in this study but, for example, education and research are outside of the scope of the methodology.

Some works protected by copyright continue to generate income after the copyright expires. This is the case with the literary classics, for example. Obviously, the vast majority of works protected by copyright lose their capacity to generate money during the life of the copyright protection. The revenue streams from the works with expired copyright form only a small fraction of the total revenue streams, and in some industries, like software in which all the materials protected by copyright are fairly new, revenue streams of expired copyrights do not exist. Using the revenue streams of the copyright industries means that it would be possible to include the income from the materials with expired copyright in the calculations. In this study, however, these revenue streams are not included. The previous studies, which were exploited in the calculations of this study, did not include revenue streams of the works with expired copyright. Therefore these revenue streams had to be left out. Picture 1 illustrates the copyrighted works included to the calculations of this study.

Picture 1.
Copyrighted works
covered in the study



[3] The term ”copyright industries” used by Koskinen-Olsson is substantially the same as the term ”core copyright industries” in the “Guide on Surveying the Economic Contribution of the Copyright-based Industries” WIPO 2003.

The copyright-based industries exploit not only Finnish copyrighted materials but also works the copyrights of which are owned by bodies outside Finland. The bulk of the revenue streams of the foreign copyrights exploited by the Finnish copyright industries returns to the foreign owners. However, a small part of them stays in Finland and is included in the calculations in this study. On the other hand, foreign copyright industries also exploit Finnish copyrighted materials and a part of the revenues generated in these activities remain with the foreign exploiters. This part of the revenue streams of the Finnish copyrights is then missing from the calculations of this study. These two cross-border revenue streams cannot be calculated within the scope of this preliminary study. However, one can fairly safely assume that the net effect of these cross-border revenue streams is relatively low. Their impact on the outcome of this study would be marginal and leaving them out does not considerably disturb the accuracy of the calculations in this study.

4. The Capital Value of Copyright Assets in Finland

The value of the revenue streams created by copyrighted works poorly corresponds with the costs needed to create them in terms of time, human resources, and money. A part of the copyrighted materials do not generate revenue streams which would compensate the money needed in creating them. Therefore the point of departure in this study is the revenue streams incurred rather than the costs of creating materials protected by copyright. The combined value of these materials can be assessed using appropriate rate of return. In the recent study by Koskinen-Olsson (2010) the value of copyright revenue streams in Finland were assessed to be 2 022 M € in 2008.

The capital value of copyright assets in Finland is calculated using the discounted cash flow method. In addition to the income streams to be discounted the DCF methods requires that an appropriate discount rate is set and the time span of the calculation is determined. Because the calculation covers the total portfolio of the Finnish copyrighted works putting a time limit for the calculation is not reasonable. The discounted cash flow must be made by calculating the present value of perpetuity, formula of which was presented in the previous chapter.

Capital Asset Pricing Model (CAPM) is applied to set the discount rate. The basis of the calculation of the discount rate is the long-term rate of return of the Finnish stocks in the Helsinki Stock Exchange. The long-term real rate of return, including increase of stock prices and dividends, of the stocks has remained 10% between 1912, the year of establishment of the Helsinki Stock Exchange, to 2007 and correspondingly on the same level between 1993 – 2007 (The Finnish Foundation for Share Promotion 2010). The 10% return rate contains the risk-free rate of return and the risk premium of fully diversified investment to the stock exchange. The interest rate of the Finnish government 10-year bond reflects the risk-free rate of return and the interest rate has been approximately 4,3 % during the past years[4]. Thus the risk premium for fully diversified investment to the listed stocks is 10% - 4,3% = 5,7%. The risk premium for one industry sector is calculated by multiplying the risk premium of fully diversified investment by beta coefficient. The industry-specific betas typically vary between 0,5 and 1,6. Beta below 1 means that the risk level of the industry is considered to be lower than industries in general while beta above 1 means than the industry is riskier than industries on an average.

This study covers several industries which all are dependent on copyright. Based on the historic data available, for some of these industries, like software, motion picture, and advertising, the beta is likely to be above 1. For some others, like press and literature, the beta has historically been less than 1 but the current changes in the business models of press and literature are increasing the risks related to that industry. The income streams to be used in the calculations include revenues of the non-listed companies. The risk premiums presented above and the typical industry-specific betas are derived from the figures of the listed companies. The non-listed, which

[4] During the recent financial crisis the return rate has fluctuated but for the purposes of this study (as in general in the DCF calculations) longer term average rates are more applicable.

normally are smaller than the listed companies, are nearly always regarded to be riskier than the listed companies. Taking the covered industries as well as the fact that also revenues of the non-listed companies are included in the calculations, the researchers assess that a beta of 1,4 reflects the expected rate of return for the copyright industries in this study. The discount rate used is then 4,3% + 5,7% x 1,4 = 12,3%.

Table 1. The Capital Value of Copyright in 2008 calculated using discounted cash flow method

Industry	Direct Copyright Revenue (M €)	Rate of Return	Copyright Capital (M €)
Press and Literature	116	12,3	943
Music, Theatre and Opera	90	12,3	732
Motion Picture and Video	115	12,3	935
Radio and Television	224	12,3	1 821
Photography	62	12,3	504
Software and Databases	1364	12,3	11 089
Visual and Graphic Arts	7	12,3	57
Advertising	45	12,3	366
TOTAL	**2023**	**12,3**	**16 447**

This method produces the value of 16,4 billion € for the entire copyright capital in Finland with Software and databases representing about two thirds of the total capital. However, the rate of return derived from the entire bulk of stocks in the exchange market does not reflect the individual characteristics of the copyright industries. Industries differ from each other especially in terms of labour productivity, capital gearing and capital intensiveness. This affects the rate of return levels. Capital-intensive industries and industries with low labour productivity typically have relatively low rates of return. The CAPM method, which was used in the calculations above, does not take the industry-specific rates of return into consideration. Therefore an alternative method was chosen to better illuminate the realities in each of the copyright industries.

In order to assess the rate of return of the copyright capital in the eight core copyright industries, a sample of 250 firms was chosen for each industry. For each industry the median (median was used instead of average in order to avoid skewness caused by the extreme high and low values) value of the rate of return of the capital employed was calculated using the data from the ORBIS[5] database. This median was used in the discounted cash flow calculations instead of the discount rate derived using the CAPM. This method takes the industry-specific rates of return into consideration better than the CAPM method used in the calculations above in the Table 1.

The calculations of the alternative method are showed in the Table 2.

5 ORBIS is an international company financial statement database published by Bureau van Dijk. www.bvdep.com

Table 2. The Capital Value of Copyright in 2008 calculated using the returns of capital employed in core copyright industries in 2008

Industry	Direct Copyright Revenue (M €)	Rate of Return	Copyright Capital (M €)
Press and Literature	116	17,2	674
Music, Theatre and Opera	90	11,4	789
Motion Picture and Video	115	19,4	593
Radio and Television	224	5,1	4 392
Photography	62	10,5	590
Software and Databases	1364	23,3	5 854
Visual and Graphic Arts	7	12,5	56
Advertising	45	20,7	217
TOTAL	**2023**		**13 167**

The alternative method produces the total value of 13,2 billion € as the total value of the Finnish copyright assets. The higher the rate of return on capital employed, the higher the demand for return on copyright capital. This method of calculation treats especially severely Advertising and Software and Databases industry, but the demand for return is high also in Motion Picture and Video and in Press and Literature. Only in Radio and Television broadcasting clearly (5.1%), and in Music Theatre and Opera (11.4%) and in Photography (10.5%) narrowly , is the return on capital employed and thus expected return on copyright assets lower than the expected rate of return calculated using the CAPM. By taking into account the differences in the rates of return, the largest copyright capital still remains in Software and Databases industry, but it now represents only 44 per cent of the total capital.

Table 2 shows that the actual median return on capital employed varies considerably from one copyright industry to another. While these calculations are made for companies' entire assets including tangible assets as well as intangibles, such as copyright, the differences indicate that there is variation among the copyright industries in their ability to create return for the capital employed. The value of the copyrighted works for each core copyright industry can be calculated using the return of capital employed as the discounting rate. This gives a fairer view of the industries than using a general rate of return for all industries.

The comparison between the alternative method and the one using CAPM illuminates that the rate of return in most of the copyright industries is higher than that of industries in general. By using the average rate of return in all industries the assessment of the value of copyrighted works would be too high. The inclusion of the real abilities of the copyright industries to create returns reduces the assessment of the combined value of the copyrighted works of the Finnish copyright industries by twenty per cent. However, this alternative method has one serious shortcoming: the calculations are based on the return on capital employed in one year only. Economic cycles, industry specific fluctuations and even company-related matters affect the annual return rates. In order to use this method the return rates must be calculated for a longer period of time, preferably over a period of ten years or longer. Within the scope and resources of this study such calculations were not possible. Therefore, in this study the assessment of the capital value of the Finnish copyright using the discounted revenue flow method with a discount rate by CAPM prevails over the alternative method.

5. Conclusions and discussion

This study was the first attempt to calculate the capital value of the copyright assets in Finland. The scope of the study included development of the method for the calculation and application of the method to assess the monetary value of copyright. The income based approach to value the copyright assets was established to be applicable for the purpose of this study. Discounted cash flow (DCF) method as a relatively simple and basic income based method was well suited for the calculation of the monetary value of the copyrighted works in Finland.

The revenue streams of the copyright assets used in calculating the value of copyright assets were derived from the study by Koskinen-Olsson (2010). The combined value of copyright revenue streams in Finland was assessed to be 2 022 M € in 2008. The discount rate used in the discounted cash flow calculations was derived using the Capital Asset Pricing Model and set to 12,3 per cent. The DCF calculation produced the capital value of 16,4 billion € for all copyright assets in Finland. The figure calculated in this study does not capture all copyrighted works. It includes those copyrighted works which are in active use and generate revenue. But it does not include the copyrighted works for which the copyright protection is expired but which still are generating revenue. It also leaves out all copyrighted works which are not generating calculable revenue, like the majority of the copyrighted works created and used by public bodies.

The study on direct copyright revenue streams (Koskinen-Olsson 2010) is the first in Finland covering that area. It gives a good cross-sectional picture of the value of revenue streams in the core copyright industries. In order to design a method that serves a longitudinal analysis, the amount of data gathered from verifiable statistical sources ought to be increased. In some cases a systematic statistical data gathering system should be established. A repeated study on the copyright revenue streams would provide for a longitudinal analysis on the changes in the revenues and it would facilitate the analysis of the monetary value of the copyrighted works. A well founded analysis of the copyright capital would greatly benefit from a longitudinal, economic-cycles-covering analysis of the copyright revenue streams. The quality and accuracy of the assessment of the value of copyright assets would improve, if the calculation could be based on median or average numbers over a long period of time, preferably ten years or more.

To improve the quality of the methodology developed in this study more accurate discount rates for the discounted cash flow calculation should be used. If the CAPM is applied, more precise beta coefficients for the copyright sectors should be calculated. However, even with industry-specific coefficients for each sub-branch of the copyright sector, the researchers would have to estimate the impact of the non-listed companies to the beta. It is unlikely that anyone can calculate the betas by including the non-listed companies because of the great number of the companies and unavailability of data.

In this study the researchers presented an alternative way to set the discount rate for the DCF calculations. This was done by calculating the median value of the rate of return on capital em-

ployed in each copyright industry covered in the study. The median was calculated from a sample of 250 firms from each industry. This method gives a better picture of the actual required rate of return in the copyright industries than the CAPM method and reflects better the individual characteristics of the copyright industries. However, the rates of return on capital employed were available only for one year. To avoid the impact of economic cycles and industry-specific fluctuations to the return rates, data and calculation of the median over longer period of time is required. Therefore the method remained secondary in this study. If the data of the copyright industries were collected over several years and the median or average rates of return of capital employed were calculated and used as the discount rates in calculating the capital value of copyright, the alternative way would be superior to the CAPM method for setting the discount rates.

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THE CAPITAL VALUE OF COPYRIGHT ASSETS IN FINLAND

This pilot study was carried out at Business and Innovation Development (BID), a special unit operating within the University of Turku, and prepared by Mr Petteri Sinervo, Development Manager, and Mr Timo E. Toivonen, Researcher. It was commissioned by Foundation for Cultural Policy Research Cupore as a contribution to a larger project for establishing a methodology for a systematic assessment of the copyright and related rights system. Finnish Copyright Society offers its publications platform for this joint publication.

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