



# Intellectual Property Valuation Techniques

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## INTRODUCTION

Unlike many of the other assets found on a company's balance sheet, the intangible assets, such as patents, trademarks and copyrights, are among the most difficult to quantify in terms of their value. It becomes further complicated to ascertain value when contemplating more obscure intangible assets, such as trade dress, trade secrets or software code. While difficult, the value of these assets can be accurately calculated via a number of industry accepted methodologies. The key to a successful analysis is to develop a comprehensive plan of action.

The initial point to determine when attempting to value intellectual property or intangible assets is the rationale for undertaking the analysis in the first place. Why do you need to know the value of the assets? The most obvious situations are those in which a third party has an interest in the asset values. For example, the Internal Revenue Service and other tax authorities want a detailed understanding about the basis for any value determination used when allocating portions of the purchase price associated with the acquisition of other companies.

This issue has become even more important with the recent issuance of Statement of Financial Accounting Standard 142, Goodwill and Other Intangible Assets, which changed the accounting treatment of certain intangibles acquired through business combinations. Instead of a more-or-less blanket treatment of acquired intangibles that featured a stated amortization period, many of these assets will now be carried on the balance sheet at fair value and subjected to periodic impairment testing. Similarly, the tax authorities will be quite interested in understanding how the value of any donated property, including patents and related intangibles, was calculated. Financing and bankruptcy are other scenarios where a third party will have a valid need to know the value of your intellectual property.

There are many situations where accurate value information is required for internal purposes as well. The purchase or sale of these kinds of assets obligates management to understand value before entering into negotiations. For example, acquisition of substantial in-process research and development could impact earnings per share as the acquired value of the IP is amortized over a relatively short economic life. Similarly, negotiating a fair royalty rate or other licensing compensation necessitates an understanding of intangible asset value.

For IP used internally, companies are establishing executive positions to directly manage the assets. Brand managers at consumer product companies and chief technology officers are but two examples. As IP management evolves, there is a corresponding need to accurately

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measure the performance of the responsible individuals, as this information can also be used when making strategic decisions regarding the use or handling of the IP.

## CONTEXT

The second order of business is identifying the context of the analysis. The context in which intellectual property is viewed is the single most important determinant of value. Typically, the value of a trademark or other intangible asset is likely to be worth more to a large manufacturer in a relevant industry than to a small business entrepreneur. This reflects the existence of complementary factors such as skilled labor, abundant capital, an effective marketing program and proven distribution channels. Because these factors differ from one scenario to the next, the same asset will have different values when viewed in the context of a large corporation, a joint venture or a company going through reorganization.

An important part of identifying the context is determining which assets are to be included in the analysis. Patents, trademarks and copyrights are the usual focus, however, there are other intangibles that can have a very real impact on the firm's success. Among these are slogans, characters, packaging design, non-compete clauses, proprietary sales methods, a well-trained staff, customer lists, training programs, trade secrets and formulae.

When considering the context, it is important to view these assets in terms of their relation to one another. For example, the intangible assets employed in the marketing process are more accurately valued as an integrated package or bundle of assets. Related assets tend to reinforce each other. With marketing assets, the overall bundle may consist of the brand name, logo and worldwide trademark registrations, secondary trademarks and logos, trade dress, websites, and any other assets that contribute to the promotion of the company, the brand or the products.

This bundling approach applies to all forms of intellectual property, whether the focus is technology such as patents, trade secrets and formulae, and/or knowledge and skills assets such as proprietary training manuals, operating procedures or customer lists. Whatever package is deemed to be the most appropriate for the immediate context, this technique provides a solid foundation for a realistic valuation exercise. Some of the most commonly valued IP bundles are:

Marketing Bundle	Technical bundle	IT Bundle
Primary Trademark	Key Patents	Operating Systems
Corporate Name and Logo	Trade Secrets	Enterprise Solutions
Marketing Umbrella	Formulae	Custom applications
Sub-brand Names	Packaging Technology	Data Warehouse
Global Trademark Registrations	Manufacturing Technology	Data Mining
Copyrights	Product Specifications	Mailing Lists
Secondary Trademarks	Product Shapes and Sizes	Domain Names / URL's
Packaging Design	Proprietary Test Results	Third Part Software Tools
Trade Dress	Technical Designs	Certifications
Product Names	Drawings, Manuals	Source Code

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At this point, the basis of measurement needs to be defined. Everyone probably has some idea what the term “value” means when referring to IP. In general, it is a measure of the benefits received from utilizing the assets. While value in this sense can be attributed to many different aspects: increased market share, higher prices, etc., in practice the value of the IP will be the result of either additional revenue or cost savings.

When calculating intellectual property values, the standard of value to be employed is again driven by the context of the assignment. The appraiser must first identify the underlying objectives in order to properly evaluate the assets. There can be a significant difference between the intrinsic value provided by the IP and what is known as its “fair market value” or “fair value.” Also, valuations performed under the litigation context may necessitate the calculation of value at a specific point in time. Consequently, the appropriate definition to use under the circumstances will have a significant impact on the conclusion reached. Some of the more common standards of value include:

- **Fair Market Value:** *The price at which an asset changes hands between a willing buyer and a willing seller, when both have reasonable knowledge of all relevant facts and neither is under compulsion to act*
- **Fair Value:** *The price at which an asset changes hands between a specific buyer and a specific seller, when both have reasonable knowledge of all relevant facts and neither is under compulsion to act*
- **Historical Value:** *The value of an asset at a specific point in time based on the circumstances in place at that time. Often useful for infringement or tax-related analyses*

Although many valuation definitions exist, most formal intellectual property valuation reports will likely refer to the “fair market value” standard. This is the definition recognized by the Internal Revenue Service and most courts.

## FAIR MARKET VALUE

With a fair market value standard, it is assumed that a hypothetical transaction takes place. The price associated with this hypothetical transaction is the determinant of the asset’s value. This standard requires that the buyer and the seller be willing to transact and be under no compulsion to act. No compulsion to act simply means that neither the buyer nor the seller is under any pressure to enter into the transaction, nor is their participation required as the result of a bankruptcy or legal ruling. Also, it is important to recognize the difference between a specific participant and a typical participant, as the fair market value standard employs the latter.

The analyst must remember that these parties are looking after their own best interests. Accordingly, the buyer and seller would view the proposed price in the context of the general economic environment in place at that time, the particular industry the asset is deployed in, and the particular type of asset in question.

Finally, both parties must have reasonable knowledge of all relevant facts. A distinction should be made between publicly available information, which theoretically everyone has access to, and private information. Very seldom do the participants of an actual transaction possess

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knowledge of all relevant facts. The guiding term here is reasonable knowledge of all relevant facts.

A simple example will serve to illustrate the difference between intrinsic value and fair market value as outlined herein. Suppose an inventor has developed a process that would allow a manufacturer to save \$25 million when compared to the expense currently incurred during his manufacturing process. The benefit of the technology is, therefore, in the form of a cost savings and the value of the developed process amounts to \$25 million in annual savings. However, \$25 million is not likely to be considered the asset's fair market value. According to the definition, fair market value is the price at which the asset would change hands. There is no incentive for the manufacturer to pay the inventor \$25 million for the development when his benefit also equals \$25 million. The true fair market value will likely be somewhere between \$0 and \$25 million, and will be determined by the various inputs that have an impact on the actual negotiation. These will include items such as the competitive environment and the existence of alternative technologies that provide the similar benefits.

While this example does not explore all of the various inputs called for in a fair market value analysis, it does provide the basis for understanding how intrinsic value and fair market value can oftentimes diverge. Also, it is important to realize that fair market value is not the appropriate standard to use in all situations.

Sometimes the assets in question need to be examined within a very narrow context comprised of specific participants and inputs, such as calculating damages resulting from a specific instance of infringement. Determining which standard to use is an important part of establishing the context of the valuation analysis.

## METHODOLOGIES

Once the assets to be valued are isolated, the appropriate timeframe determined, the proper measurement of value selected and the context of the valuation has been identified, it is time to consider which valuation methodologies to utilize.

The most widely recognized valuation methodologies fall into one of three categories: The Cost Approach, the Market Approach and the Income Approach. Each has strengths and limitations that make them more or less appropriate depending on the specific circumstances of the assignment.

## THE COST APPROACH

The Cost Approach seeks to determine the value of IP by aggregating the costs involved in its development. At first glance this may seem fairly simplistic. However, there is much more to it than merely adding up all of the receipts for expenditures associated with the R&D. Indeed, there are two distinct Cost Approach methods: Reproduction Cost and Replacement Cost.

"Reproduction Cost" is the level of expenditures needed to reproduce an exact replica of the asset. This methodology is appropriate in situations such as litigation involving the specific intangibles in question. Alternatively, "Replacement Cost" measures the expenditures necessary to develop an asset with similar utility and is appropriate in circumstances such as

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determining a target price prior to negotiations, or calculating a basis for suitable royalty rates or transfer pricing.

An important requirement for both methods is that the measurement of the costs be performed as of the valuation date, as opposed to when the historical expenditures actually took place. Only the expenditures necessary to reproduce or replace the intangibles in the environment in existence on that date should be included. The appropriate date may be a current or historical date.

The impact of this requirement is twofold: First, if the cost of any of the relevant components has changed since the initial expenditure, the current cost must be incorporated into the calculations. Second, any developments taking place in the interim that would materially impact the development process need to be factored in as well. An example of this would be the use of software applets in writing code. Software code developed prior to the widespread use of this technique could conceivably be developed in a far shorter timeframe and at far less expense now than in the past, when each piece of code was written from scratch. Furthermore, not all costs encountered during the time period an intangible was developed should be included, only those that would be required to duplicate the asset or create an asset of similar utility. These will consist of both direct expenditures and opportunity costs.

The direct expenditures will consist of items such as materials needed in the development process, labor costs, and some overhead items. Again, these costs should be considered as of the date of valuation looking forward, not from a historical perspective. If the available literature has progressed to the point where, say, a developmental process for a patented technology that took 20 researchers three years to develop could now be accomplished by four researchers working for one year, the latter structure is the template to use when estimating their impact. Furthermore, the appraiser must ensure that the salaries, benefits, and other employment costs being attributed to those hypothetical researchers are based on current practices, not on the specifics in place historically.

Overhead and management costs, such as project supervision, utilities, and administrative costs, should be pro-rated to reflect their true involvement with the direct development process. When projecting the timetable needed to develop the IP in question, based on the current environment of prices, knowledge, and available inputs, consideration must be given to the probability of success, which will act as a mandatory discounting factor.

The opportunity costs consist of the other courses of action and investment opportunities that have been ignored in order to pursue the development of this intangible. If structured properly, this element will recognize the required return on investment being made by the asset's owner. Other opportunity costs include the lost profits resulting from delays in commercializing the product.

The possibility of obsolescence also should be addressed. If someone develops a superior technology, the other factors may be of less or no importance. When the objective of one's analysis is to determine the value of the IP in the marketplace, whether via the Reproduction Cost method or the Replacement Cost method, any elements of the IP that are obsolete in the current environment must be excluded.

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The Cost Approach is most useful in cases where there is minimal economic activity to review, such as early-stage technology. It is also effective at establishing a maximum price for the asset if the context relates to a proposed transaction. This situation exists when there are numerous candidates for substitution available. The relevant theory is that an investor will not pay more for an asset than the corresponding cost to develop or obtain an asset of similar utility.

The main drawback associated with the Cost Approach is that it pays little attention to the economic benefits associated with marketplace activity. Consequently, this lack of emphasis on revenue and/or profit data ignores an important standard of value by which many assets are measured.

In sum, an accurate valuation using the Cost Approach is one in which: All relevant costs, including opportunity costs, have been factored into the analysis; they have all been treated appropriately; the probability of success has been contemplated; and, the issue of obsolescence has been properly addressed.

## MARKET APPROACH

The Market Approach to IP valuation is similar to valuation techniques used for assets such as real estate and/or machinery. With real estate, the value of a four-bedroom house close to good schools can be accurately estimated by researching recent transactions featuring comparable homes in the same neighborhood. Similarly, intellectual property value is determined by comparing the IP to comparable assets that have recently exchanged under similar circumstances.

Because the indication of value is based on comparable transactions and there is a high degree of familiarity with the intrinsic concepts established through other asset valuation experience, this method is usually preferred by finders of fact, tax authorities and other third parties. This approach is best if an active market exists that includes many recent examples of arm's length transactions for comparable intangible assets.

Since IP is unique by definition, it is sometimes difficult to establish that assets are indeed comparable. Before making this claim, it must be verified that the transactions contain adequate information on terms and conditions. Information necessary to establish comparability includes the type of asset, the relevant industry, geographical constraints, exclusivity, payment mechanisms and timeframe, among others. It is important to know if there are extenuating circumstances such as a bankruptcy filing or forced divestiture. These events will likely impact the terms contained within a potentially comparable transaction and, thus, may render it unsuitable for the analysis. Also, the conditions of the market at the time a transaction takes place will influence the sales or license terms for intangible assets. These relevant factors must be considered when using the Market Approach.

Accurate and complete data analysis is of vital importance. Once empirical sales and licensing transactions have been selected based on circumstantial comparability of the relevant factors described above, it must be determined whether the financial characteristics of the underlying operations are comparable as well. Moreover, the price information contained in these



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comparables will frequently be adjusted using a common reference point such as sales of branded products or some type of margin analysis.

An advantage of this approach is that it can be applied to a wide variety of intangible assets in a vast array of circumstances. It is equally valid when applied to an established trademark or an early stage technology. As long as there is transactional data for comparable assets, the Market Approach will prove to be effective.

Unfortunately, the intangible asset domain has not developed well-defined, actively traded secondary markets. This problem is exacerbated by the fact that transactional data on intangible assets is rarely published and, therefore, it is oftentimes quite challenging to gather enough data to provide an appropriate number of comparable transactions. The bottom line is that market transaction information can be extremely useful in analyzing and valuing intellectual property, however, it seldom is comprehensive enough to provide the basis for a satisfactory conclusion of value on its own.

## INCOME APPROACH

The Income Approach addresses the ability of the intellectual property to generate cash flow. While the Cost Approach has specific applications in certain situations and with particular types of intangibles, and the Market Approach has its own limitations, the Income Approach is generally applicable to most situations and intangible assets.

This approach is based on discounted cash flow theory and defines the value of the subject property as the present value of the anticipated net economic benefits to be achieved over the duration of the property's economic life. When using the Income Approach to value intellectual property, future income or cash flow related to the business, business segment or product line under consideration is estimated. The forecasted cash flow is then discounted via present value calculations to determine the current value of the operation. At this point, it is necessary to ascertain the portion of this value that is attributable to the intellectual property.

When using the Income Approach, particular attention is paid to five main parameters that determine value: Revenue or income associated with the use of the IP; expected growth characteristics of the identified revenue or income; expected duration of the revenue or income; risk associated with generating the estimates of revenue or income; and, the proportion of the revenue or income that is attributable to the subject IP.

These parameters are based on observations of relevant markets including size, growth trends, market share dynamics among participants and overall market risk characteristics.

Comprehensive knowledge of the attributes of the specific intangibles is also essential. These include the stage of development; unique characteristics such as bankruptcy or market leadership; and, relevant pricing information associated with the products that feature the subject IP.

The development of an accurate forecast of revenue is dependent upon substantial knowledge of the competitive and economic environment in place during the appropriate timeframe for the valuation. It will also need to accurately depict an appropriate estimate of the property's remaining economic life. The estimation of a property's useful economic life must incorporate a

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variety of factors such as potential obsolescence, historical usage, expiration of patents, etc. For example, a forecast of future revenue should not extend beyond the protection offered by a patent. On the other hand, a two or three-year expected lifespan may be too conservative when analyzing a trademark with a 25 year history of success in the marketplace. Keep in mind that the estimate for the remaining economic life of the assets is dependent upon the projected prospects of the property and the history of the assets.

The discount rate used in the calculations must incorporate all of the risks that have an impact on the generation of the future income or cash flow. Risks to consider when determining the discount rate to use in the calculations include the overall market risk, specific industry risk and risks associated with the specific intangibles and operation being analyzed. Several methods are available to calculate an appropriate discount rate, including the capital asset pricing model (“CAPM”), the weighted average cost of capital (“WACC”) and the Build-up method.

As stated above, it is important to differentiate between the business enterprise value and the value of the intellectual property that supports the business. Two of the more effective techniques for separating these two elements are the Relief from Royalty method and the Technology Factor.

### RELIEF FROM ROYALTY

The Relief from Royalty method measures value by estimating future revenue associated with the intellectual property over its useful life and then applying an appropriate royalty rate to the revenue estimate. It is called Relief from Royalty because it measures the costs that are avoided (the royalty payments that are not made) due to the firm’s ownership of the assets. The royalty rate used in this analysis isolates the portion of value that is attributable to the associated intellectual property. When marketplace royalty rates are used, the willing buyer / willing seller dynamic required by the fair market value definition is preserved. The present value of the estimated royalty payments is then calculated using a discount rate that incorporates all the associated risks involved in achieving the revenue forecasts and royalty streams. Keep in mind that it may be necessary to add a specific asset class premium to the discount rate to capture the unique risk characteristics associated with individual intellectual properties.

When identifying appropriate royalty rates for this analysis, the license agreements should feature similar attributes. As with the market comparables discussed above, these will include the type of asset, relevant industry, geographical usage, exclusivity, sub-licensing and advertising constraints, payment mechanisms and the appropriate timeframe. Also, the license agreements should be of an arm’s length nature and be free of distortions such as different market characteristics or an associated bankruptcy filing.

Based on our experience, research on appropriate royalty rates will likely uncover a fairly wide range of applicable royalty rates. For example, entertainment property trademarks used on apparel items may range from 4% to 12% of net wholesale sales. The differences among the various agreements will largely be due to the relative strength of the properties being licensed and their associated market share characteristics. Of course, a property commanding 12% of net wholesale sales is going to be much more valuable than one commanding 4% of net



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wholesale sales, and the range of value calculated by using both extremes will likely be unacceptably large.

Obviously, one of the keys to an accurate valuation based on the Relief from Royalty method is to determine the appropriate royalty rate to use in the calculation. A relative strength analysis will help to narrow the range of royalty rates to a more accurate and acceptable range. Factors that will influence the relative strength analysis are financial characteristics such as growth rates and market share; legal and historical factors such as duration of use and registration protection; risk factors such as potential obsolescence and barriers to entry; and, the availability of complementary assets such as breadth of distribution and marketing expertise. An analysis of these factors will aid in determining if an appropriate royalty rate for the subject asset is closer to the 4% rate or the 12% rate in our example.

Once all of the various factors have been determined, including the revenue forecast, appropriate royalty rates, relevant timeframe and an accurate discount factor, the calculation of the net present value can be performed. This is accomplished by aggregating the present values calculated for each year. The corresponding sum of the annual present values provides the overall estimate of the asset's fair market value.

### TECHNOLOGY FACTOR

The Technology Factor approach is designed to measure the portion of a business unit's overall market value that is based on the utilization of the underlying technology. The willing buyer / willing seller aspect of the fair market value definition is incorporated by scoring a series of attributes as to whether they favor a buyer or a seller in a hypothetical negotiation.

The first step is to determine a forecast of operating results for the organization using the technology. The present value of this cash flow is then calculated using a discount factor that encompasses all risks associated with the generation of the estimated future results. Using this technique accurately depends on ascertaining the appropriate Technology Factor. This factor is determined by establishing an upper limit for the contribution of value provided by technology used in that particular industry and then performing a relative strength analysis via various utility and competitive attributes to narrow the contribution of the subject technology to a specific percentage.

The upper limit represents the maximum percentage of total business value that can be attributed to the technology. Industries whose products feature large contributions from technology, such as scientific instruments and medical devices, will have relatively high upper limits; while those with products requiring little technology will have relatively low upper limits.

Once an appropriate upper limit has been determined, various competitive and utility attributes that reflect the strengths and weaknesses of the technology are reviewed. Examples of utility attributes that may be included in the analysis are the current stage of the technology, the level of capital required to commercialize the technology, the size of the potential market and the margins associated with the operation. Competitive attributes may include the existence of alternative technologies, the potential for obsolescence, the likely response by competitors and the technology's potential to displace existing products.

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These attributes are selected, weighted and scored based on the circumstances specific to the present valuation. Depending on how they are scored, some may indicate a higher value; others may indicate a lower value and others may be neutral to the final value. Not all attributes will be of equal importance and should be weighted accordingly.

In a fair market valuation, the utility and competitive attribute averages are usually given equal weight, although that is not mandatory. The mean of these two averages is then taken to arrive at the final Technology Factor. The resulting Technology Factor is then multiplied by the net present value of the subject organization to arrive at the value of the technology. In this way, the value of the technology is segregated from the value contributed by other assets of the business.

Because the upper limit is based on the contribution of all intangibles to overall value, it restricts the viability of the Technology Factor for use on operations that feature a mix of both technology and valuable trademarks. Similarly, the presence of several different technologies in one product can lead to erroneous conclusions when determining the value of only one of them is the goal. Alternatively, the Technology Factor approach can be quite effective at calculating the value of technology for licensing, donation or other situations where the operation being analyzed features the subject technology.

### CONCLUSION

There are a number of methods available to calculate the value of intellectual property. Some are specifically designed to measure the value of certain assets, such as the Technology Factor, while others are flexible enough to use on any type of intangible asset. The Cost Approach is sometimes better suited for early stage technology than others, while the Market Approach may suffer from a lack of available information. The method used in each case will depend on the assets being valued, the circumstances surrounding the analysis, and the availability of essential information.

The quality of every valuation analysis is a function of the accuracy of the data and assumptions that form the basis for any conclusions reached. If available, it is always better to use actual data or historical results than to rely on assumptions. Unfortunately, it is not always possible. However, it is possible to ensure that any assumptions made are based on the financial, market, economic and competitive characteristics in place during the appropriate timeframe for the analysis.

In sum, the selection of the appropriate methodology relies on a thorough understanding of the valuation context and the business environment on the part of the analysis, as well a solid grasp of the unique characteristics of the intellectual property under consideration. By correctly designing the valuation analysis, it is possible to provide a calculated answer to any question

associated with the value of intellectual property, whether it addresses the level of damages related to patent infringement or the price to pay for a trademark. Ultimately, in all cases, context is the primary arbiter of value.

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