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WIPO/IP/SIN/99/13
ORIGINAL: English
DATE: October 1999

MINISTRY OF FOREIGN AFFAIRS
GOVERNMENT OF THE
REPUBLIC OF SINGAPORE

WORLD INTELLECTUAL
PROPERTY ORGANIZATION

SINGAPORE-WIPO JOINT TRAINING COURSE FOR ASIA AND THE PACIFIC REGION ON INTELLECTUAL PROPERTY AND TECHNOPRENEURSHIP DEVELOPMENT

organized by
the World Intellectual Property Organization (WIPO)

and
the Ministry of Foreign Affairs
of the Government of the Republic of Singapore

under the Singapore-WIPO Joint Training Program
in the Field of Intellectual Property

Singapore, November 9 to 18, 1999

MODULE 6: IP VALUATION ISSUES AND STRATEGIES

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INTRODUCTION

Intellectual property is the central resource for creating wealth in almost all industries. The foundation of commercial power has shifted from capital resources to intellectual property. Nowhere is this more true than in biotechnology and pharmaceuticals. In fact the definition of capital resources is shifting. No longer does the term capital resources bring to mind balance sheets of cash or pictures of sprawling manufacturing plants. The definition of capital includes intellectual property such as technological know-how, patents, copyrights and trade secrets. Corporations once dominated industries by acquiring and managing extensive holdings of natural resources and manufacturing facilities. Barriers to entry were high because enormous amounts of fixed asset investments were required to attempt to displace well-entrenched players. Today, companies that once dominated industries are finding themselves fighting for survival. Up-start companies are creating new products and services based not on extensive resource holdings or cash hordes but on intellectual property resources. Management of these properties will define the winners from the losers in the decades ahead.

The goal of this first chapter is to establish a framework for consideration of the contribution of intellectual property to a business. From this foundation royalty rates can be derived.

IP Dominates Business

In a time period shorter than ten years, corporations have been faced with technological advances including the continued miniaturization of electronics and widespread communications without wires. Surgical equipment manufacturers are facing increased use of noninvasive surgical techniques. Computer makers have seen their mainframe businesses literally reduced to, and replaced by, a laptop model. CD-ROMs are killing traditional encyclopedia sales. All of these changes are technology based. As a result, all corporations need more technology and it is often the kind they do not possess. The New World order is defined by change. The leaders in this tumultuous environment will be those that embrace change. Change is coming fast and it keeps coming - all driven by technology. Time to gain expertise in all the different technologies required to compete does not exist. There is no room for the old *not-invented-here* mindset. The pace of change does not afford any company the luxury of developing expertise in all the divergent technologies that it needs. It is even doubtful that such a wide-ranging goal could be accomplished.

The Intellectual Property Age is on us and the new paradigm is yet to be fully played out but clearly the trend is away from independence and toward a vital need for the talents of others. Interdependence is at the root of the paradigm shift taking place. Technology management in the future will center on leveraging technology that is owned to gain access to technology that is needed. Sharing technology is a concept many will find difficult to accept but accept it they must. Denis Waitley writes in *Empires of the Mind*[1], "The leaders of the present and the future will be champions of cooperation more often than of competition. While the power to maintain access to resources will remain important, 'the survival of the fittest' mentality will give away to survival of the wisest, a philosophy of understanding, cooperation, knowledge, and reason. Access to vital resources has changed because the

[1] Denis Waitley, *Empires of the Mind - Lessons to Lead and Succeed in a Knowledge-Based World*, William Morrow and Company, Inc., New York, 1995, page 8.

nature of the most important resources is no longer embodied in fixed material assets. Gaining access to technology means cooperating with other companies, even competitors, in order to gain access to their knowledge-based resources. Independence is again being replaced by interdependence. Waitley succinctly explains, "The future leaders will only get what they want by helping others get what they want."

Along with the demise of self-sufficiency is the death of captive internalization of technology. The past saw technology commercialized solely by its developer. Corporations conducted research and focused efforts on promising discoveries. Additional effort brought about innovative new products and the new products were brought to market by the originator. This has changed for all industries including biotechnology and pharmaceuticals. Small biotechnology research firms are very often the source of new innovations while large established drug houses are still the best means for conducting clinical trials, gaining government approvals and implementing global distribution activities. The results of these collaborations have been successful but they introduce a challenge with regard the sharing of the economic benefits that are derived from the separate contributions. The drug industry is illustrative. In the past, a royalty on sales was all that was paid by a large pharmaceutical company to a biotechnology firm for a license of the new invention. In the past, valuing the patented invention in the hands of the inventing biotechnology firm primarily focused on the present value of the future stream of royalty payments expected to be received from the major pharmaceutical company. A new trend is emerging. Small biotechnology companies are requiring their large pharmaceutical company partners to allow them to more fully participate in the economic benefits of commercializing new inventions. Manufacturing rights and promotion rights have entered the deal picture. Some biotechnology companies are successfully negotiating license deals that allow the inventing biotechnology company to retain some manufacturing rights. Some are also retaining rights regarding co-promotion of the commercialized invention. These rights represent added sources of future economic benefits beyond the traditional royalty income. They also introduce added expenses that must be considered in the valuation process.

A comparison of the division of rights, then and now, is shown below. Figure 1 lists the division of rights that have been traditional. The inventing biotechnology company patents an invention and then finds a large drug company interested in pursuing refinement of the invention. If an efficacious product was ultimately developed the biotechnology inventor would get royalties and the drug company would get an exclusive worldwide license for commercialization. Often the drug companies obtained complete commercial control of the invention and the inventor received royalties from the licensor.

Figure 1

Traditional Biotechnology and Pharmaceutical Company Deal Parameters

***Inventing Biotechnology Company Gets*:**	***Pharmaceutical Licensee Gets*:**
License Fee *Equity Investment* Milestone Payments Royalty Income on Sales	Exclusive Development Rights Exclusive Manufacturing Rights Exclusive Promotion Rights Exclusive Profits from Commercialization (after paying royalties)

Figure 2 shows the new trend whereby inventing biotechnology companies are starting to retain more commercialization rights. The traditional deal parameters still hold for some aspects of commercialization but are completely changed for other aspects. A straight license agreement can still be found for some territories but in other territories, commercialization responsibilities and rights are more broadly shared.

Figure 2

New Trends in Biotechnology and Pharmaceutical Companies
Deal Parameters

***Inventing Biotechnology Company Gets*:**	***Pharmaceutical Licensee Gets*:**
License Fee Equity Investment Milestone Payments Royalty Income on Sales Shared Manufacturing Rights Shared Promotion Rights Shared Profits from Commercialization	Exclusive Development Rights Exclusive Rights in Certain Territories In Other Territories: -Shared Manufacturing Rights -Shared Promotion Rights -Shared Profits from Commercialization

A BUSINESS ENTERPRISE FRAMEWORK

Converting intellectual property into revenues, profits and value requires a framework of integrated complementary business assets. Complementary assets are required to convert intellectual property into a product. These assets are also needed to produce the product, package it, sell the product, distribute it, collect payments and implement the many other business functions that are required for running a business. Companies that create intellectual property and then license it to others are still not free of the fundamental need for complementary assets. While the creators of intellectual property that license it to others may not need to acquire and use complementary assets, successful commercialization of the licensed intellectual property is still dependent on organizing such assets. Royalty payments to the creator are still dependent on the licensee organizing the needed complementary assets for exploitation of the licensed property.

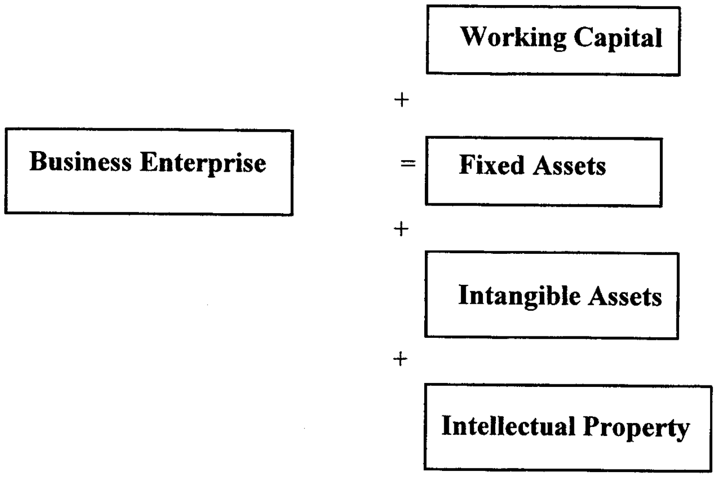
Figure 3 shows the composition of a typical business enterprise as comprised of working capital, fixed assets, intangible assets and intellectual property. It represents the collection of asset categories that all companies use to participate in an industry and generate profits.

Fixed assets include: manufacturing facilities, warehouses, office equipment, office furnishings, delivery vehicles, research equipment and other tangible equipment. This asset category is sometimes referred to as hard assets. The amount of funds invested in this category can vary greatly for different companies, depending on the industry in which they participate. As an example, huge investments in manufacturing assets are needed by companies participating in the automotive, aerospace, paper, semiconductor and telecommunications industries. In other industries, the manufacturing asset investment requirement is lower. Arguably, assemblers of electronic consumer goods fall into this category. Also in this category are insurance brokers, computer software publishers, manufacturers of cosmetics and many business service companies.

Working capital is the net difference between the current assets and current liabilities of a company.[2] Current assets are primarily composed of cash, accounts receivable and inventory. Current liabilities include accounts payable, accrued salary and other obligations due for payment within twelve months. The net difference between current assets and current liabilities is the amount of working capital used in the business.

Figure 3

Composition of a Business Enterprise



The investment in working capital also varies by industry. The banking and insurance industries must maintain large amounts of working capital but in the hotel industry, where raw materials and parts inventory are almost non-existent, working capital is a minor component of the business enterprise.

Intangible assets and intellectual property are the *soft* assets of a company. Generally, intellectual properties are those created by the law; such as the provision in the US Constitution that established the patent system. Trademarks, patents, copyrights and trade secrets are some of the examples. Intangible assets are of a similar nature. They often do not possess a physical embodiment but are nonetheless still very valuable to the success of a business. Customer lists, distribution networks, regulatory compliance know-how, clinical trial know-how and good manufacturing practices are examples

All of the assets of the business enterprise framework contribute to the revenue and profit generating capability of the business. They are also the underlying basis for the value

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[2] Current assets are defined by generally accepted accounting principles as assets which are expected to be converted into cash within twelve months of the date of the balance sheet on which they appear. Current liabilities are financial obligations that are expected to be satisfied within twelve months of the same date.

of the business as depicted in Figure 4. The equity and long term debt values represent the basis by which all other assets of a company were acquired, whether by purchase or internal creation.

Figure 4
Value of a Business Enterprise

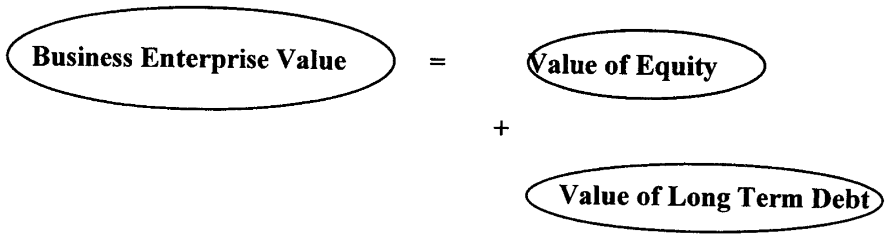
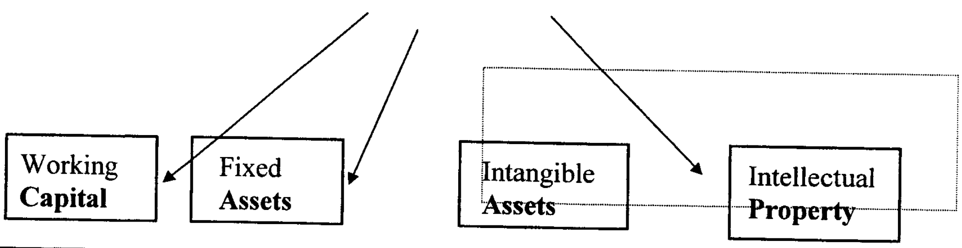


Figure 4 also shows that the value of the same enterprise, as depicted in Figure 3, equals the value of the aggregate asset categories. The value of the enterprise is equal to the present value of the equity of the stock of the company and the long-term debt of the company. These two components are also referred to as the invested capital of the company.

All of the assets comprising the business enterprise framework contribute to the commercialization of intellectual property by allowing for the creation and delivery of products or services which generate revenues and profits for a company. The ability of a company to sustain earnings makes it a valuable investment.[3] The relative value of intellectual property can be identified by estimating the portion of value or earnings attributed to specific intellectual property. Figure 5 shows that the profits of an enterprise can be allocated to the different asset categories that comprise the enterprise. The amount of profits enjoyed by an enterprise is directly related to the existence of the different asset categories. Companies lacking any one category of assets would have different profits. The earnings of a business are derived from exploiting its assets. The amount of assets in each category along with the nature of the assets and the quality of the assets determines the level of earnings that the business generates.

Figure 5
Distribution of Earnings



[3] Earnings are the basis of value. The valuation of corporate stock is most often based on the present value of the expected future earnings of a company. The amount, growth rate and risk associated with expected earnings is typically converted into a value for the price of a company's stock.

Beyond Commodity Earnings

Working capital, fixed assets and intangible assets are arguably commodity assets that all businesses can possess and exploit. A company that possesses only these limited assets will enjoy only limited amounts of earnings because of the competitive nature of commodities. A company that generates superior earnings must have something special usually in the form of intellectual properties such as patented technology, trademarks or copyrights. The contribution of excess earnings to commercial operations generally occurs in three primary ways:

1. Price premiums can be obtained from the sale of technology-based products where the market place is willing to pay a higher price than it otherwise would be expected to pay for products lacking the technologically based enhancement of utility. When all, or a portion, of the premium survives manufacturing costs and operating expenses the enhanced bottom-line profit margins are considered to be directly attributed to the existence of unique technology or other intellectual property.

2. Cost savings can enhance the bottom-line profits though the marketplace may not provide a product price premium. When a technology allows for a product or service to be produced and/or delivered at a reduced cost the enhanced earnings are attributed to the technology used in the operations.

3. Expanded market share can also generate incrementally higher profit margins from economies of scale that come from high volume production. This can occur even when premium product pricing or manufacturing cost savings are not possible.

Gravel quarries are generally an excellent example of a commodity business. The product delivered by quarries lack the enhanced utility introduced by technological intellectual property. These companies possess all of the typical business enterprise asset categories previously discussed except for intellectual property. They may even possess extensive amounts of intangible assets in the form of customer lists, corporate procedures, and favorable union contracts. Yet the nature of their product places gravel quarries in a very competitive position where excess earnings beyond those obtainable in a commodity business are not sustainable for the long term. Overall, profit margins in the quarry business are slim. The reason is the absence of intellectual property for which the company can charge premium prices.

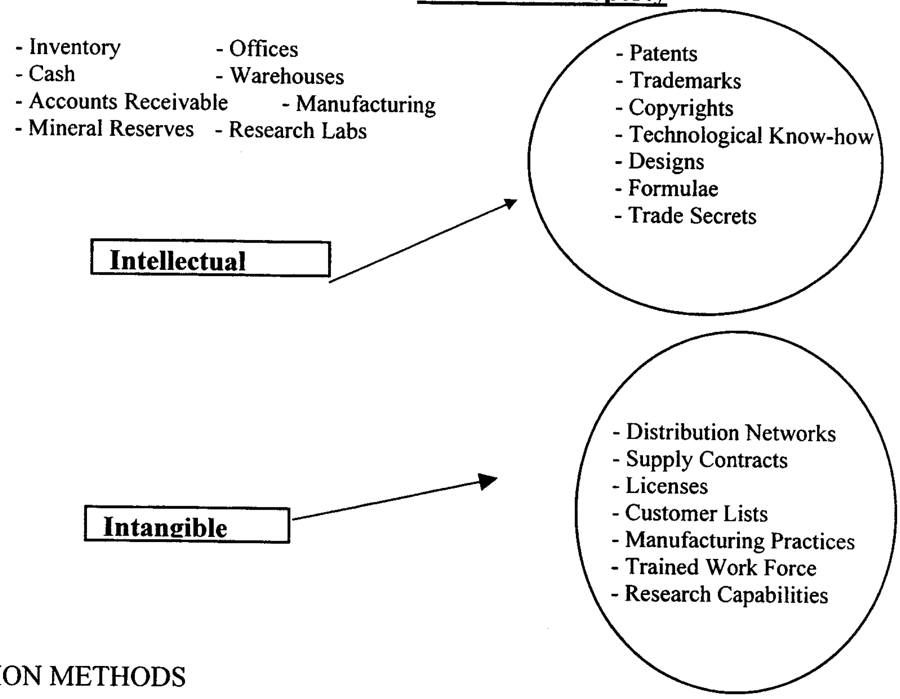
Later in this chapter the allocation of earnings among the asset categories of the business enterprise is demonstrated as a foundation of deriving royalty rates. The allocation is based on each asset category earning a fair rate of return on the investment value of the category. When the profits of the company are *absorbed* by the investment rate of return requirements of working capital, fixed assets and intangible assets then little earnings are available for allocation to intellectual property. Such would be the case expected from an analysis of a gravel quarry business enterprise. In other industries, substantial amounts of earnings are still available after the rate of return requirements of non-technological assets are satisfied. The excess amount of earnings are derived from the existence of intellectual property. In many cases technology is the driving force.

Stock portfolios are illustrative of this concept. A portfolio of stocks can be compared to the composition of a business enterprise. Instead of working capital, fixed assets, intangible assets and intellectual property, a comparative stock portfolio might be comprised

of bank stocks, equipment leasing company stocks, business service stocks and technology stocks. The total return of the portfolio is derived from the different stocks. The value of the different stocks is directly related to the portion they deliver to the total portfolio return.[4] In the case of stock portfolios, the total return is calculated by adding the returns provided by the different stocks in the portfolio. The separate returns of each component of the portfolio are known. This is not the case for the *business enterprise portfolio.* The total earnings of the business enterprise is the known quantity and the allocation among the contributing components is the objective for quantifying the value of intellectual property and establishing a subset of business profits to allocate to licensed technology as a royalty.
Figure 6 presents a more detailed illustration of the business enterprise framework.

Figure 6

Business Enterprise = **Working Capital** + **Fixed Capital** + **Intangible Assets & Intellectual Property**



VALUATION METHODS

Three primary methods exist for valuing intellectual property. These are the Cost Approach, Market Approach and Income Approach. Each will be briefly described below.

THE MARKET APPROACH

This approach can determine the value of a subject property by considering the prices paid for similar properties as part of third party transactions. For intellectual property, it is often difficult to implement this approach because information about third party transactions involving similar property is often scarce. The exchange of intellectual property in the

[4] The investment risk associated with the individual stock returns is also an important valuation concept that will be discussed later in this report.

marketplace is typically completed as part of the exchange of an entire company or division. Rarely do we see a specific patent or trademark exchanged as an independent entity. Usually the exchange includes the enterprise with which the intellectual property is associated. The price paid for the enterprise includes an amount for working capital, fixed assets, the assembled workforce, and various types of intangible assets and intellectual property. Even where specific intellectual properties are exchanged separately, the price is rarely disclosed. Some recent instances were intellectual property has traded independently and where price information was disclosed include:

> Sale of the After Six trademark as part of a bankruptcy liquidation for $7 million.
>
> Purchase of the patented Polymerase Chain Reaction technology from Cetus Corporation by Roche Holdings Ltd. for $300 million plus five years of royalties.
>
> Purchase of seven liquor trademarks by American Brands, Inc. from Seagram Company for $372.5 million. The marks included Calvert Gin, Calvert Extra American Whiskey, Kessler American Blended Whiskey, Leroux Cocktails, Lord Calvert Canadian Whiskey, Ronrico Rum and Wolfschmidt Vodka.
>
> Sale of the Black Hawk trademark in 1985 for $3 million as part of the bankruptcy of Rath Company, a meat packer.
>
> Sale of the Gloria Vanderbilt trademark by Murjani in 1988 for $15 million to Gitano.
>
> Purchase of thirty-two medical remedy trademarks by Menley & James Laboratories for $52 million.

Combined sales for the brand names purchase by American Brands totaled $235 million for the fiscal year just prior to the transaction. A simple market multiple can be calculated indicating a price to revenue multiple of 1.59 for "middle brow" liquor brands. Without possessing more detailed product information from Seagram, only simplistic allocations of purchase price can be accomplished. Still, if the total price is divided equally among the seven names then the value of each brand is approximately $53.2 million. Since the brand name Calvert is used in three of the names purchased, it might be more appropriate to divide the purchase price by four yielding a per brand value of $93.1 million.

The thirty-two trademarks purchased by Menley & James included over-the-counter medical remedies such as Contac cold remedy, Ecotrin aspirin, Hold cough medicine, ARM allergy medicine and Rosemilk skin lotion. Combined annual sales of all 32 trademarked products just prior to the purchase were $30 million indicating a price to revenue multiple of 1.73 for the trademarks. On a per name basis, the value per trademark equals $1.6 million. Menley & James uses contract manufacturing, warehousing and distribution. All that was purchased were the marks.

The market approach provides an indication of value by comparing the price at which similar property has exchanged between willing buyers and sellers. When the market approach is used, an indication of the value of a specific item of intellectual property can be gained from looking at the prices paid for comparable property. Requirements for successful use of this approach include

1. The existence of an active market involving comparable property.

2. Past transactions of comparable property.

3. Access to price information at which comparable property exchanged.

4. Arm's length transactions between independent parties.

Transactions of specific items of intellectual property are still rare events. When transactions actually occur, the terms of the exchange are not often disclosed to the public. The most difficult aspect of the market approach as it applies to intellectual property is comparability. Even if pricing information for a specific exchange regarding a specific patent or trademark were available, the price at which the property exchanged most likely will have no bearing on the value of other patents and trademarks unless positive comparability exists.

Comparative Analysis Summarized

Comparative analysis of similar technology exchanges is discussed in detail later in this paper. License agreements are often compared when searching for an appropriate royalty rate to associate with an exchange of intellectual property. The same considerations that are important for comparing licenses apply when comparing market transactions that involved outright sales of intellectual property

Presented below is a summary of the key characteristics of a market transaction, which will make such a transaction useful as a proxy for valuing intellectual property. In a perfect world, a useful proxy transaction for establishing a fair market value would:

1) not be an internal sale between a parent corporation and a subsidiary[5];

2) have been negotiated at a date that is relevant to the date of the subject analysis;

3) have been negotiated between two independent parties, neither of which were compelled to complete the transaction because of financial distress;

4) involve similar intellectual property for use in the same industry in which the fair market value is desired;

5) transfer rights for use of similar intellectual property into a country having similar economic conditions as the country in which the fair valuation is desired;

6) involve similar intellectual property with similar remaining life characteristics;

7) require similar complementary asset investment requirements for commercial exploitation;

[5] As previously mentioned this problem is slowly being resolved as multinational corporations bring their internally specified royalty rates in-line with third-party transactions.

8) specify pricing terms that are not clouded by non-monetary components of compensation;

9) include comparable aspects of exclusivity;

10) include pricing terms that were freely negotiated and unencumbered by governmental regulations;

11) specify pricing terms that are not clouded by undefined amounts that are indirectly attributed for technical assistance compensation.

Factors Driving IP Value

In residential real estate, comparability is quite easy. The neighborhood, square footage, number of rooms, and quality of construction can all be compared to the indications of value established by past sales of other homes. Adjustments can be made for differences such as pools, fireplaces, and finished basements. After adjustments, the market transactions can lead to a value for the house being studied. Unfortunately, valuation is not as easy for intellectual properties such as patents and trademarks. Many factors come into play. Presented below are some of the most important factors that should be considered when seeking intellectual property comparability:

Industry
Market Share
Profits
New Technologies
Barriers to Entry
Growth Prospects
Legal Protection
Remaining Economic Life

Industry cycles and economics can limit the value of businesses and the intellectual property that they possess. Market transactions that are to serve as a basis for an indication of value are most useful if the exchanged property is employed within the same industry, subject to the same prospects, demographic factors, government regulation, and investment risks. If a trademark used in the cosmetics industry were sold, the price at which the transaction occurred might be a good indication of the value of other cosmetic trademarks. This assumes, however, that the influence of the other factors listed is the same. A trademark that was exchanged in the steel industry would not be considered useful for valuing a cosmetics trademark.

Profitability is fundamental to the existence of monetary value. Intellectual property that contributes to strong and continuing profits is very valuable. Market transactions involving trademarks in the same industry might not be a reasonable comparison unless profitability measures are the same. An excellent example is sports products. For the most part, the primary players in the sport shoe market produce products of almost equal quality. Each competitor has products with designs and features that are intended to enhance athletic performance and prevent injury. Yet, some branded products have achieved substantial profits above the average achieved by major competitors. Part of this should be attributed to the recognizability of the trademark by consumers and the positive attributes that they associate with the name. If a sport shoe trademark were to exchange, an indication of value for another trademark in the same industry might not necessarily be provided. The profits associated with the trademark would also need to be at similar levels for a reasonable comparison. While industry transactions are a fundamental factor for judging comparability, comparable profitability is also very important.

Market share can often be associated with profitability. Control of a large share of a big market provides a company with enhanced profits from economies of scale. Patented products and trademarks can contribute to maintenance of a significant market share, and this factor must be reflected in the value of intellectual property. Intellectual property transactions may not be comparable if the market share comparisons are not positive.

Emerging technologies can have a significant impact on the value of intellectual property. The potential competition that emerging technology represents can affect the remaining economic life of intellectual property. When looking at intellectual property transactions as market indications of value, care must be taken to ensure that the effect of emerging technology is comparable with the property being valued. The existence of research that is expected to make the subject property obsolete must be reflected in the value decision. Even within the same industry, intellectual properties may not be influenced to the same degree by emerging technology. The computer software industry evolves at light speed. Many software programs have an economic life of only a few years. In 1985, Fifth Generation Systems introduced the first hard disk back-up program. This allowed a hard disk to be backed-up in under ten minutes to floppy disks. This was a fantastic product for programmers. Previously, hours were spent each time a protective back up was made. The product was a big seller, but in less than two years, sixteen competing products entered the market. Many of the competitors included advanced features. The value of the original software of Fifth Generation must reflect the effect upon future profits from these other programs as well as the inroads that are expected from new products that complete back up by continuous processing using an expansion board. In looking for market transactions of comparable property, consideration must be given to the effect that derives from new products and technology. If the market transactions center on intellectual property that is free of the impact of technology gains, their use in valuing otherwise similar property is inappropriate.

Barriers to entry can enhance the value of intellectual property. Barriers include distribution networks, substantial capital investments, and well-entrenched competitors. FDA approval in the drug industry is an example of a barrier to entry. The value of currently accepted proprietary drug products is supported, in a sense, by the hurdles that competitors must jump in order to enter the market. The time delay allows the current products to enjoy less competition, higher pricing options, and most importantly an opportunity to dominate the market. Market dominance can be achieved in many ways through advertising, establishment of customer loyalty, or the development of highly efficient production facilities. As such, intellectual property within a market that also presents high entry-barriers is possibly more valuable than similar property that operates in a more open industry.

Growth prospects are directly related to value. This relationship exists because a growing income stream is more valuable than a flat or declining income stream. The intellectual property that the income stream flows from is valued according to the growth prospects of the income. Generally, higher growth can be associated with higher value, assuming that investment risks are the same. Comparable market transactions are not useful as value indicators if the properties being compared have decidedly different prospects for future income growth.

Legal protection that excludes others from making use of the property is another important factor. When there is a question about the strength of this protection, the value of intellectual property is weakened. This is especially true for patents. A basic patented technology covering the activities for an entire industry is far more valuable than a patent covering a small aspect of an industry. If a patented technology can be "designed around," the underlying value of the patent is weak. Dramatic assurance of strong legal protection is associated with patents that have withstood the examination of infringement proceedings. Once validity is reaffirmed and acknowledged, usually in the form of a substantial damage award for the plaintiff, the patented technology is highly valuable. Evidence of the reaffirmed value can usually be detected in the number of industry participants lining up to take licenses at royalties that leave little room for negotiation.

Remaining life must also be considered in the valuation of intellectual property and intangible assets. Just like the old house that will require complete refurbishment in a short time, intangible assets having dissimilar years of remaining utility are not good comparisons. Two patents with many similar characteristics of industry application, growth potential, profits and market share may still not be reasonable comparisons if one has only a few years until expiration.

When market transactions of specific intellectual property exist that have similar characteristics to the property under study, direct application of the market approach is possible. When intellectual property has been exchanged as part of a package of assets (usually as part of a business enterprise), then an allocation of the purchase price among the assets is required in order to identify the amount that is specifically attributable to the intellectual property.

THE COST APPROACH

The cost approach seeks to measure the future benefits of ownership by quantifying the amount of money that would be required to replace the future service capability of the subject intellectual property. The assumption underlying this approach is that the cost to purchase or develop new property is commensurate with the economic value of the service that the property can provide during its life. The cost approach does not directly consider the amount of economic benefits that can be achieved nor the time period over which they might continue. It is an inherent assumption with this approach that economic benefits indeed exist and are of sufficient amount and duration to justify the developmental expenditures.

Determination of value using the cost approach usually begins either with a determination of the current (as of the appraisal date) cost to obtain an unused replica of the subject property. The starting point when using the cost approach is to obtain an estimate of the cost to reproduce a new replica of the intellectual property. One method is a trending of historical costs.

Historical Cost Trending

Some corporations keep detailed records of the costs that were incurred in the development of a specific intangible asset. Restatement of these historical costs in current dollars provides an indication of the total cost that would need to be invested in order to reproduce the property. Some of the information that would be important to identify in valuing a technological asset using the cost approach includes:

1. Scientists and engineers who worked on the product development effort.
2. Salaries and benefits of those involved with the project.
3. Overhead costs for utilities and research space.
4. Overhead costs for clerical support and technicians.
5. Raw materials used in the development process.
6. Prototype construction and testing expenses.
7. Outside services for independent evaluation and certifications.
8. Pilot plant expenses.

This same process can be used to value a trademark. As with the trending of historical development expenses for trademarks, there are similar questions regarding the point at which initial development begins and ends as well as where continued improvement and maintenance begin. Also, consideration must be given to the types of expenses that should be included, such as:

1. Concept development
2. Consulting expenses
3. Preliminary consumer testing
4. Package designs
5. Advertising campaign development
6. Commercial planning, scripting, and recording
7. Television, radio, newspaper, and magazine spot costs

Re-creation Costs

Another means by which to derive the cost to reproduce an asset is a direct estimate of the efforts and costs necessary for creating a similar asset. A lack of accurate record keeping often requires this approach. In the case of specialized software, this can be accomplished by estimating the costs associated with the following:

1. Salaries and benefits that would be paid to computer programmers.
2. The length of time required for program development.
3. The amount of overhead and support costs for developmental computer time, office space, utilities, clerical support, and so on.
4. The time and costs associated with installation of the program on company computers and the time needed to achieve full implementation of the program.

The aggregate of all of the expenses from the above efforts is an indication of the cost to reproduce the asset. This procedure provides an indication of the costs necessary to reproduce the intellectual property in a form that is "brand new." Adjustments for elements of obsolescence must then be considered.

Cost Versus Value

Cost is not the same thing as value. Unless economic benefits can be earned from ownership of the property, the value must be relatively low regardless of the amounts needed to develop the property. Consider the trademark EDSEL. This automobile name still has solid national recognition among many people in the United States. The cost to create an automobile name of similar strength would easily cost tens of millions of dollars. Yet current ownership of this name is not likely to contribute much in the way of profits for today' s car seller. Indeed, the name could be a detriment; association with an old and discontinued product probably would not inspire consumers. The fair market value of an asset can therefore be significantly degraded by the economics of the business to which it is devoted. The extent to which it is degraded depends on the type of asset. Unique assets may suffer considerably because they have little use outside of a particular business. Other assets that have general use may only suffer in value to the extent of the costs that would be incurred to remove them from the business and transport and install them in a new business and location for use in a more profitable industry. This is referred to as asset versatility. Many fixed assets have a value that is relatively independent of the business or industry in which they are used. Delivery trucks can be used in another business or industry. The economics of a specific industry do not affect fixed asset values as severely as they do some types of intellectual property. The value of trademarks and patents are sometimes very closely aligned with the economic condition of the business or industry in which they are used. Redeployment of a brand name to another industry is not necessarily easy to accomplish. The economic fate of a trademark or patent may be exactly parallel to that of the business in which it is used.

Using the Cost Approach for Trademarks

The cost approach can sometimes serve as a useful base in gauging the value of a trademark. Information about the costs incurred to establish well-known marks is sometimes available. This data can serve as a guide for trademark values, which have similar fundamental characteristics. Important characteristics for comparison include those already discussed for the market approach and the following:

* Market size in which the mark competes
* Market share with which the mark is associated
* Price premium on the trademarked products or services
* Advertising support
* Profitability of the product or service with which the mark is associated
* Market research indications of consumer recognition
* Possible trademark extension

If an acceptable comparison exists and the cost to establish a specific trademark is known, then the amount may be useful in determining an indication of value for the trademark under analysis. Marketing consultants estimate that the national introduction of a newly branded consumer product costs at least $20 million. Information about trademark introductions is often publicized as part of the ad campaign or is sometimes presented in the annual reports of public companies. The process of name selection alone is very expensive. Consulting firms are now regularly used for product name selection, with fees ranging from $75,000 to $750,000. The process involves these steps:

1. A legal search to try to assure that the chosen name is not presently in use by others.
2. Brainstorming with clients, associates, industry experts, and psychologists.
3. A linguistic search to determine the foreign language meaning of possible names.
4. Market research to study the reaction of consumers, stockholders, company executives, and Wall Street analysts.

5. Research regarding font selection and size.
6. Research to select colors to associate with the product through the name.

The process also takes up the time of senior company executives. All of this effort and expenditure takes place before any money is even spent with advertising agencies for campaign development and ad placement.

The linguistic search has taken on more importance than ever before as products are sold globally. An automaker was reportedly considering the name Sojourn for a new car. Peaceful travel immediately comes to mind in the English language. However, there was concern about how the name would be interpreted in other countries. The name Sojourn was too similar to words in French and German meaning "halt" and "abrupt stop." These words did not inspire driving confidence. The name was dropped from consideration. The name search continued, and the costs to establish the new car' s identity continued to mount. Even color research is considered important and requires additional research and interviews with potential consumers. Certain colors, such as yellow, are taboo for food products.

Unbelievably, experts in the world of name selection indicate that the availability of desirable names is dwindling. Desirable names suggest quality, value, performance, strength, vision, and/ or responsibility. Meeting these requirements is an expensive research endeavor.

Company names have received tremendous amounts of attention as well. The shift in business orientations from manufacturing to services has increased. Names that once reflected the mission of a company no longer apply. A prime example is PRIMERICA. Previously named American Can, this company no longer has anything to do with the manufacture of cans. Its name change was fostered by a desire to reflect a new image for a completely different company. During 1987, 1500 companies changed their names at considerable expense.

> The name change of EXXON from Esso was estimated by insiders to have cost the company between $ 100 and $150 million.
>
> Medium-size banks, depending on the number of branches, can spend $2 million on a new name.
>
> The costs include printing new stationary and business cards and the replacement of signs. For EXXON, this required the replacement of signs at every gas station carrying this brand of gas.

A well recognized trademark costs a great deal to create and a great deal to replace. An estimate of trademark value can sometimes be obtained by studying the costs that created comparable names that possess similar measures of the characteristics that we previously outlined.

Using the Cost Approach for Technology

Unlike nationally recognized trademarks, general comparisons for technological development costs are not well publicized. Technological property also does not easily lend itself to a basic comparison of fundamental characteristics.

A failure of the cost approach as previously mentioned is that direct consideration of the economic benefits and the period over which they might be enjoyed is not accurately captured in the value. This is an important missing element that is best expressed in the following examples:

> During the late 1950s, the U.S. Government spent many millions of dollars on the development of nuclear-powered aircraft. A prototype was built and tested. Unfortunately, the engines were never able to generate enough thrust for liftoff. Application of the cost approach might provide an indication of value well into nine-figures. However, considering the potential for application of nuclear aircraft technology and the prospects for economic benefits, a cost approach indication of value would be in error. The current value of an aircraft technology that fails to get the craft airborne is zero.
>
> Another example is represented by technology that was quite adequately able to perform the desired task: extraction of oil from shale rock. At considerable expense, the U.S. Government ventured once again into technological development where others feared to tread. This technology worked. It was to be part of our salvation from the death grip of OPEC in the early 1970s. But with the steep decline in oil prices, the cost of producing shale oil is far too high; the technology sits on the shelf with no prospects for use in the near future. The cost approach might indicate that the value of the technology is another nine-figure bonanza, but economic conditions tell us that the shale oil technology has very little value. Someday in the distant future, conditions may require its use. However, the current value of zero reflects the possibility that the use of shale oil technology may be a long way off.

Where economic conditions are not conducive to deriving profits, it is difficult to ascribe any value to intellectual property regardless of the indications of the cost approach. There is also the possibility that an intellectual property can have economic potential far above that which would be indicated by the cost approach. A patented product may have been inexpensive to create but still have significant value because of the huge demand for the product regardless of the selling price.

<u>Cautions In Using the Cost Approach for Intellectual Property</u>

The cost approach is not as comprehensive as the other two valuation models. Many of the most important factors that drive value are not directly reflected in the methodology and must be considered apart from the basic cost approach process. These factors include:

> 1. The cost approach does not directly incorporate information about the amount of economic benefits that are associated with the property. These benefits are driven by demand for the product or service and the profits that can be generated.
>
> 2. Information about the trend of the economic benefits is also missing from consideration. Intellectual property providing economic benefits with an increasing growth rate can be far more valuable than that which displays a downward trend. The trend is effected by social attitudes, demographics, and competitive forces but the cost approach cannot capture the affect on value.

3. The duration over which the economic benefits will be enjoyed is yet another element not directly considered that has a significant affect on value. The remaining economic life of the property is a vital component to value conclusions.

4. The risk associated with receiving the expected economic benefits is not directly factored into the cost approach model. Where a high degree of risk makes realization of expectations speculative, a lower value corresponds.

5. The adjustments that are necessary to reflect the affects of obsolescence must be separately calculated and are often difficult to quantify.

For example, suppose that two trademarks are being valued with the following characteristics:

Trademark 1 is associated with a highly profitable product in a growth industry for which there is very little competition. Consumer recognition is strong, and there is a strong potential for the trademark to be extended to new product applications while maintaining an above average profit margin.

Trademark 2 is associated with a low profit margin product in a declining industry that has become crowded with competition. Consumer recognition of the trademark has become blurred with that of competitors and has almost no potential for application to other products.

If both names are associated with national brands and advertising campaigns, the cost approach might easily indicate the same value for each of the trademarks. The research, advertising, and promotion that went into establishing each name might be the same. A trending of historical advertising expenses could actually provide a higher indication for the trademark that is associated with the low profit product. However, the cost approach can provide an indication of an order of magnitude to use as a starting point or as a check on the values derived from other approaches.

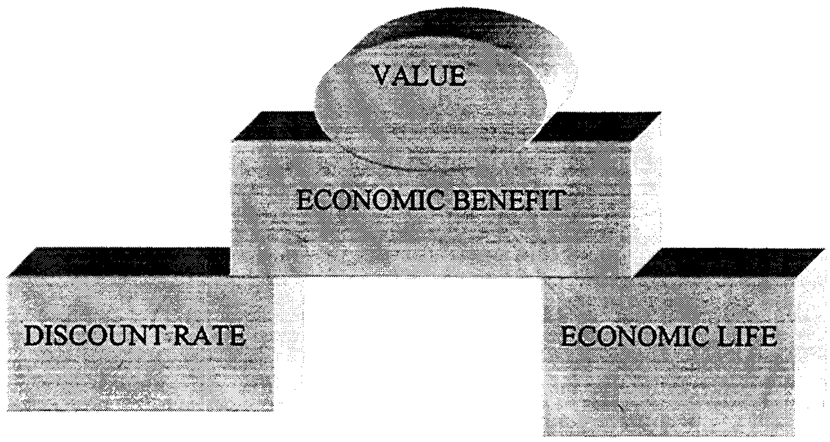
Use of the cost approach as a means to estimate a range of value for intellectual property has much potential for error. One or both of the other valuation approaches should be used along with the cost approach as support for the indications of value provided by the market and income approaches.

INCOME APPROACH

The fair market value of any asset can be expressed as the present value of the future stream of economic benefits that are derived from ownership of the property. This section discusses converting the economic contribution that is attributed to intellectual property into an indication of value. Fundamental factors important to successfully using the income approach can be summarized by answering the following questions:

What amount of economic benefit can be expected?
How long can it be expected to continue?
What risks are associated with receiving the anticipated benefits?

The primary factors that represent value are depicted as building blocks below.



Economic Benefits

The future stream of economic benefits is often best measured by the amount of net cash flow to be derived from employment of the property. This measure should take into consideration the costs of doing business as well as the additional capital investment that will be needed to sustain the cash flow. After accounting for these future uses of gross cash flow, the net amount represents the economic benefits derived from ownership of the property. The amount of future net cash flow is not solely determined by management actions. Other factors can enhance or diminish the sustainable level of these benefits. The amount of cash flow that will be available on a sustained basis is affected by economic climate, profitability, competition, and capital requirements.

Economic Climates

Economic climates are cyclical. The health of the general economy in which intellectual property is employed has a significant bearing on the amount of net cash flow that will ultimately be realized. Monetary policies, federal budget deficits, and income tax laws all contribute to the condition of the economy. Demand for the service or product that is derived from the intellectual property is directly related to general economic conditions. In addition to the ultimate amount of product demand, pricing pressures caused by prevailing economic conditions will affect the net cash flows that are ultimately enjoyed. An example is inflation. During periods of low inflation, manufacturers are usually able to directly pass along to consumers the rising raw material and production costs. The contribution margin associated with the intellectual property is therefore maintained and sometimes even increased. During periods of high inflation, however, not all of the increased production costs can be passed along to consumers without losing sales volume. When the economy is under severe inflationary pressures, profit margins are generally squeezed, and the contribution that is associated with the intellectual property is also reduced. Often, the economic climate can affect a specific industry. A healthy overall economy can still possess pockets of weakness isolated in certain industries. When considering the amount and sustainability of cash flows from intellectual property, it is important to study the conditions and outlook for the specific industry in which it is used. The most advanced technology in the world may not be able to overcome certain industry conditions that limit demand for a product or service. Where it is possible for certain forms of intellectual property to generate cash flow from a variety of industries, the diversified nature of the income stream can enhance the value of the property in comparison to other property with limited fields of application and a non-diversified income stream.

Profitability

Profitability is a vital factor affecting the amount of net cash flow. It aggregates the cost elements such as wages, procurement of raw materials, conversion of raw materials, selling efforts, and the overhead involved with producing a service or product. Many variables enter into the ability to sustain a positive balance between revenues and costs. The value of intellectual property is directly related to its ability to contribute to the attainment of sustainable profits. Intellectual property that can enhance the profitability of a product line is inherently valuable. The contribution may be process technology that saves raw materials, energy, labor, or other manufacturing inputs. Profits can also be attributed to intellectual property when process technology allows substitution of inexpensive input factors for costly inputs to achieve optimization of production costs. Some of the contributions that are made by intellectual property toward enhancing profits include:

Reduction in the amount of raw material input that is required per unit of output.

Reduction in the amount of electrical, gas, or steam energy used in the manufacturing process.

Automation of part or all of the process, thus allowing a reduction in the amount of labor.

Substitution of less expensive input factors, for those inputs costing more, without an effect upon the product quality.

Achievement of enhanced product or service attributes such as quality, reliability, or aesthetics, while still maintaining the same unit production cost.

Reduction of the amount needed as capital investment while still being able to produce adequate product quantities to satisfy demand.

Intellectual Property Profit Contribution

Quite often, analysts estimate the contribution margin attributed to intellectual property by using a market-negotiated royalty rate. The contribution to cash flow from intellectual property is estimated as the amount the business would have to pay a third party to license similar property. The amount saved in licensing royalties is considered to represent the profit contribution of the intellectual property. This procedure is fraught with potential errors. Rarely do royalty rates associated with licensing negotiations represent the full amount of economic benefit derived from the subject intellectual property. Most often the royalty rate represents a sharing between the licensor and the licensee of the intellectual property economic benefits. The licensee uses the property and pays a portion of the enjoyed benefits to the licensor as a royalty but keeps some of the benefits derived from the property. The royalty therefore rarely represents the total economic benefits derived from using the intellectual property.

Some of the other problems associated with using license-derived royalty rates as a proxy for intellectual property economic contributions include:

1. Proxy royalty rates that are available may reflect specific licensing clauses that were negotiated. The effect of license agreement clauses on the negotiated royalty rate may be quite appropriate for the conditions under which the property was licensed, but may correlate very poorly with the conditions that exist for outright ownership.

2. Many royalty rates were negotiated by legal experts with insufficient consideration for business risks and investment rates of return.

3. Many "industry" royalty rates were established years ago. They reflect economic conditions, business risks, and investment rates of return that are no longer appropriate.

Competition

Competition can affect the achievement of economic benefits through the introduction of alternate products and services or by the development of superior technology. The strategies of competitors can limit the amount, duration, and trend of future net cash flows. The owner of a highly profitable asset may only enjoy cash flows for a limited amount of time. Competitors are quick to recognize markets that provide enhanced profit opportunities. Their actions can diminish the growth rate of future cash flows or cause cash flows to abruptly halt with the introduction of superior products or services. Patent protection is not absolute in all cases because competitors may be able to offer alternative technological benefits or products.

Capital Requirements

Capital requirements can reduce the amount of future net cash flows that can be realized from exploitation of an asset. The value of any asset is best measured by the cash flow that is thrown off after allowing for "re-investment." This can take the form of plant expansions and higher working capital requirements. In fact, a very desirable characteristic of intellectual property is that it can sometimes allow the generation of earnings with less investment in plant and equipment. This component of value is captured when the future net cash flow is expected to be enhanced by reduced requirements for capital additions.

Cash Flow Duration

Technological breakthroughs can abruptly interrupt the stream of economic benefits. Governmental regulations can also cause standard business practices to become obsolete. Value is very sensitive to the remaining period of time over which cash flows will be received. The duration over which net cash flow is to be received is just as important as the amount. The economic life of intellectual property may be short due to advancing technologies, industry practices involving regular model changes, changes in social attitudes toward a product or service, and other factors. It is a critical factor in determining the value of intellectual property and is fully discussed in a later chapter.

The economic benefits associated with a specific intellectual property are not required to be immediate for the property to have value. Many years of development and research may be required before net cash begins to flow, but the property can still have a huge value because of its potential. The value, however, is still dependent on the amount, growth rate, and timing of the economic benefits. Typically, net cash flows are estimated by comprehensive analysis of the market for the products that can be derived from the intellectual property. It is much easier to make forecasts of net cash flows for technology that has proven to be commercially viable. Embryonic technology presents many challenges to forecasting. Still, the value of emerging technology is directly related to the present value of the future economic benefits that will ultimately be enjoyed. Forecasting net cash flows for uncertain technology is precarious. The degree of certainty with which the forecasts are viewed has much to do with the discount rate that is used in the value triangle.

Discount Rate

This valuation component measures the compensation of the investor for the commitment of capital. A capital commitment causes an investor to give up other investment opportunities and assume the risks associated with a particular investment. Factors that affect this component of value include inflation, liquidity, real interest rates, and measures of relative risk. The discount rate is used to translate the future economic benefits into present value. The equation below shows that the discounted future cash flows equal the value of the underlying technology:

$$V = \frac{CF_1}{(I + i)} + \frac{CF_2}{(I + i)^2} + \frac{CF_3}{(I + i)^3}$$

where:

V = the value of the intellectual property,
CF = the amount of net cash flow during each successive time period and
i = the required rate of return on the intellectual property.

If the future cash flows are expected to grow at a constant rate, introduction of this factor into the model along with algebraic wizardry provides a useful form of this equation as follows (g represents the constant growth rate that is expected):

$$V = \frac{CFo\,(I + g)}{i-g}$$

When the growth rate is expected to be higher than the discount rate (i), the equation is not useful, and specific projections for each year are necessary.

Inflation

Inflation can diminish the purchasing power of the future economic benefits that are achieved. The discount rate used must include assumptions about inflation to compensate for this loss of purchasing power. High inflationary expectations require a correspondingly higher rate of return. This is needed to compensate for the negative affects upon the purchasing power of the expected cash flow.

Liquidity

Liquidity is another risk that must be considered. Liquidity represents the relative difficulty with which an investment can be quickly converted into cash. Many financial securities can be traded on active public exchanges for cash at any time. Intellectual property investments, especially those during embryonic development, do not possess this strong characteristic of investment liquidity. Additional return to the investor is warranted and should be reflected in the discount rate when liquidity is lacking.

Real Interest

Real interest represents the component of return on investment associated with sacrificing use of the invested funds. It is the reward for deferring consumption in favor of investment. In its pure form and in a risk-free environment, the real interest rate has been shown to be about 3 percent. The typically higher rates that are paid by investments reflect compensation for the risk elements that are introduced by inflation, illiquidity, and risk premiums.

Risk Premium

Risk premium is the added amount of return that investors demand for the assumption of risk in excess of real interest in a risk-free investment when there is the possibility of loss and/or an unanticipated variability in earnings. The amount of risk premium varies according to the type of property and the industry. An element of risk already discussed is the likelihood of competitive technologies that could make the owned property obsolete. Computer software products are an example of intellectual property that quickly looses out to improved and more powerful products within very short time periods. Compensation for this risk requires a premium.

The income approach determines the value of intellectual property by isolating the economic benefits associated with commercializing the property and discounting these benefits to a present value by discounting them at an appropriate rate of return that reflects the risk associated with attaining the expected economic benefits.

ROYALTY RATES

Defining royalty rates for licensing agreements is another form of intellectual property valuation. In fact it is more often the goal of valuation assignments than the determination of an outright sales price. The primary forces driving the value of intellectual property and royalty rates are listed below[6]. It is important to remember that these forces must be considered within the framework of the business enterprise previously discussed.

1. Profit Margins
2. Market Penetration Potential
3. Capital Investment Requirements
4. Commercialization Costs

[6] An underlying assumption in this discussion is that the rights associated with the intellectual property in question are valid and enforceable.

Profit Margins - All other things being equal, such as the amounts invested in working capital, fixed and intangible assets, a technology that allows enjoyment of high profits deserves a higher royalty than a technology that generates lower profits.

Market Penetration Potential - When a technology allows the user to capture a larger share of a market than would have otherwise be possible, higher royalty rates are appropriate for the same reason associated with market size economies of scale.

Capital Investment Requirements - The technology that requires less investment in fixed assets to achieve its potential is more valuable than a technology requiring large investment requirements. A larger royalty rate is appropriate for a technology that can be commercialized while requiring a limited capital investment.

Commercialization Costs and Remaining R&D Requirements - As with capital expenditures, the level of commercialization costs are directly related to the level of royalty rates. A technology that requires years of development and investment before commercialization deserves less in royalties than a technology that is ready-to-go. Risk plays an important part in this factor. A product requiring commercialization efforts may not prove-out. Not only is time lost on an unfruitful effort but money is lost pursuing an unsuccessful product. The amount, timing and risks associated with commercialization and R&D costs relates to the level of royalty rate that is appropriate for a given technology.

Complex Factors That Can Impact Royalty Rates

Too often, royalty rates are negotiated using basic rules-of-thumb. In some cases such practices are the only means by which a deal can be successfully concluded. It is important however to remember that basic rule-of-thumb royalty rate guidelines have weaknesses. The primary reason that a general rule-of-thumb fails is because too many important factors specific to the technology and industry under study cannot be reflected within simplified rules. Listed below are some of the complex factors that should be reflected in technology pricing. Three economic factors are identified along with a subset of factors for each of the primary ones. Other methods exist that can alleviate part of the problems associated with rules-of-thumb. In a later chapter such methods will be explored.

- Economic Benefits Derived from the Technology
    - ◊ benefits derived from complementary assets
    - ◊ competitor efforts impacting the economic benefits
    - ◊ consumer reactions
    - ◊ management competency
    - ◊ production efficiencies
    - ◊ commercialization expenses
    - ◊ commercialization time frame requirements
- Duration of the Economic Benefits
    - ◊ rapid technological obsolescence
    - ◊ alternative technologies
    - ◊ validity of patent risks
    - ◊ changing consumer reactions
- Risk of Receiving the Economic Benefits
    - ◊ economic risk
    - ◊ regulatory risk

◊ political risk
◊ inflationary risk
◊ unexpected conditions and events

SIMPLISTIC RULES OF THUMB

Some of the general rules used to determine a royalty rate are discussed below along with their weaknesses.

The "25%" Rule

Fully stated, this method calculates a royalty as 25% to $33^1/_3$% of the gross profit, before taxes, from the enterprise operations in which the licensed intellectual property is used. At best, this method of royalty determination is crude. Gross profit has never been accurately defined where this rule is discussed. Gross profits, based on generally accepted accounting principles definitions, reflect the direct costs of production - manufacturing expenses. These include raw material costs, direct labor costs, utility expenses, and even the depreciation expenses of the manufacturing facilities. All of the costs and expenses associated with conversion of raw materials into a final product or service are captured in the gross profit figure. Since this is often the area of greatest contribution from intellectual property, consideration of the amount of gross profits is reasonable. It fails however to consider the final profitability that is ultimately realized from the intellectual property. Absent from the analysis are operating expenses such as selling, administrative, and general overhead expenses. An argument for eliminating these operating expenses from the analysis might center on the idea that the value of intellectual property, such as manufacturing technology, is best measured by the enhancement of profits in the area of the business in which they have the most direct effect. A more broadened view however shows that an intellectual property royalty can be affected by selling expenses and other on-going operating expenses that are part of the commercialization.

Intellectual property that is part of a product or service which requires small amounts of marketing, advertising and selling effort is far more valuable than a product based upon intellectual property that requires huge efforts in these areas. When national advertising campaigns, highly compensated sales personnel and highly skilled technical support people are needed to provide customer support, bottom line profits are lowered.

Two patented products may cost the same amount to produce and yield the same amount of gross profit. Yet, one of the products may require extensive and continuing sales support. The added costs of extensive and continuing sales efforts make the first product less profitable to the licensee from a bottom line measure. While the two products may have the same gross profit margins it is very unlikely that they would command the same royalty given the different conditions regarding selling and support costs.

The operating profit level, after consideration of the non-manufacturing operating expenses, is a far more accurate determinant of the contribution of the intellectual property. The royalty for specific intellectual property must reflect the industry and economic environment in which the property is used. Some environments are competitive and require a lot of overhead support costs which reduce net profits. Intellectual property that is used in this type of environment is not as valuable as intellectual property in a high profit environment where less support costs are required. A proper royalty must reflect this aspect of the economic environment in which it is to be used. A royalty based on gross profits alone cannot reflect this reality.

The percentage of profit that should ultimately go to the licensor is considered by most advocates of The 25% Rule to be flexible. Yet when a licensee must heavily invest in complementary assets, a lower percentage of gross profit may be more proper for defining a royalty rate. If very little investment is needed, then a royalty based on a larger share of gross profits may go to the licensor. Intuitively, this is correct, yet the methodology provides no clues as to quantifying a relationship between the licensee capital investment requirements and the percentage of gross profit that goes to royalties.

The 25% Rule also fails to consider the other key royalty determinants of risk and fair rates of return on investment. Higher risk rates generally indicate lower investment values. Lower investment values mean that lower royalty rates are indicated. A royalty method focusing on gross profits doesn't even begin to capture the risk that is associated with the business in which the intellectual property is used.

Too many important factors cannot be reconciled with The 25% Rule. There are many factors to be considered in selecting an appropriate split of gross profits. Unstructured consideration of these important factors, absent a formalized investment analysis, is bound to omit from consideration too many important considerations.

Industry Norms

This royalty rate determination methodology misses more of the important elements than The 25% Rule. Here, consideration of the profitability of the enterprise using the intellectual property is lacking in addition to the other failures of The 25% Rule. The Industry Norm method focuses on the rates that others are charging for intellectual property licensed within the same industry. Investment risks, net profits, market size, growth potential, and complementary asset investment requirements are all absent from direct consideration. The use of Industry Norms places total reliance on the ability of others to correctly consider and interpret the many factors affecting royalties. It places total reliance on the abilities of the founders of the Industry Norm rate. Any mistakes made by the initial setting of an industry royalty are passed along.

Changing economic conditions along with changing investment rate of return requirements also are absent from consideration when using industry norms. A royalty established only a few years ago is probably inadequate for reflecting the changes in the value of the licensed property and the changes that have occurred in the investment marketplace. Even if an industry norm royalty rate was a fair rate of return at the time it was established there is no guarantee that it is still valid. Value, economic conditions, rates of return and all of the other factors that drive a fair royalty have dynamic properties. They constantly change and so must the underlying analysis that establishes royalties. Industry Norms are legacies passed down from those that have licensed before us. Royalties based on the Industry Norms method are royalties based on rumor.

Return on R&D Costs

When considering a reasonable royalty the amount spent on development of the intellectual property is a terribly attractive factor to consider. Unfortunately, development costs are also terribly misleading. The main theme of the analysis presented throughout this chapter concentrates on providing a fair rate of return on the value of the intellectual property assets. The amount spent in the development is rarely equal to the value of the property. A proper royalty should provide a fair return on the value of the asset regardless of the costs incurred in development.

The underlying value of intellectual property is founded on the amount of future economic benefits that are expected to be derived from commercialization of the property. Factors that can limit these benefits include the market potential, the sensitivity of profits to production costs, the period of time over which benefits will be enjoyed and the many other economic factors that have already been discussed. Development costs do not reflect these factors in any way, shape or form. Basing a royalty on development costs can completely miss the goal of obtaining a fair return on a valuable asset.

The US Government spent many millions on development of nuclear powered aircraft engines in the 1950s. Engines were tested and prototypes were built. Aircraft were designed and development costs soared. Nuclear powered aircraft engines were unfortunately never able to deliver the thrust needed to get aircraft airborne. As such, the value of nuclear aircraft engine technology would appropriately be consider low. Zero. But, a royalty method based on development costs would indicate a high royalty because future economic benefits are not a factor. Whenever someone cites development cost as a reason for a high royalty, remind that person of the royalty that same person would likely pay for nuclear powered aircraft engine technology.

<u>The 5% of Sales Method</u>

For unknown reasons one of the most popular royalty rates is 5% of sales - Sales multiplied by .05 equals royalty payment. It shows up in a lot of different industries. It is associated with embryonic technology and mature trademarks. It has been found in the food, industrial equipment, electronics, construction and medical device industries. Forget profits, capital investment, earnings growth, operating expenses, investment risk and even development costs. Somehow 5% of sales prevails. Don't be fooled. It's not a magic bullet answer.

INFRINGEMENT DAMAGES ANALYSIS

The courts have recently provided some guidance for deriving royalty rates in the form of a differential profit calculation. The strength of patents allow patent owners to negotiate higher royalties. The new and favorable attitude toward patents originated in the Carter Administration and came to fruition in 1981. The patent system was fundamentally strengthened with the creation of The Court of Appeals of the Federal Circuit (CAFC). It is the only court that handles intellectual property based appeals throughout the nation. Its decisions have clarified and made uniform US law.

Previous to 1981, when infringement cases were initiated, preliminary injunctions were granted only when there was a reasonable likelihood that the infringed patent could be proved to be valid and infringed. While preliminary injunctions were typically granted in trademark and copyright cases, they were seldom granted for patents. The owner of the infringed patent was required to prove the validity of the patent in order to be granted a preliminary injunction. Only where prior court decisions had found the patent valid was this really possible.

Therefore, injunctions were rarely granted for patent cases. To infringe on an existing patent was not a risky decision because an infringer could continue to exploit an infringing product or service while court cases dragged out. In cases where infringement was decided, damage awards were typically expressed as royalties in amounts that represented what would have been negotiated had the infringer taken a license before beginning the infringing activity. Prior to the creation of CAFC, infringement was almost a risk free strategy. The worst consequence an infringer faced was payment of the low royalty that should have been initially negotiated.

Currently, the Federal Circuit standard has placed the burden of proving a patent invalid upon the infringer. This supports the patent owner. Infringers must provide clear and substantial proof of invalidity. Otherwise the patent owner is considered to have a valid patent. This attitude, of presumed validity, is very powerful and makes infringement very costly and risky. Entire manufacturing plants may be shut down and entire work forces may be indefinitely on layoff. Substantial investments by infringers can be rendered worthless. Infringement is more costly than ever. This new attitude by CAFC strengthens our patent system, making patents more valuable than ever before. Another shift in the legal system that enhances patent values is the willingness of juries to grant huge awards. In addition, where willful infringement is proven, the damage award can be increased to three times the actual amount of damages.

Infringement Damages - The Analytical Approach

The Analytical Approach is a method for deriving a reasonable royalty, first expressed in a patent infringement court decision. While a license negotiation may be independent of any legal actions, insight can be gained from considering the royalty rate models that are used in legal proceedings. The analytical approach, as dubbed by the courts, determines a reasonable royalty as the difference between profits expected from infringing sales and a normal industry profit level. The analytical approach can be summarized by the following equation:

$$\text{Expected Profit Margin} - \text{Normal Profit Margin} = \text{Royalty Rate}$$

In TWM Mfg. Co., Inc. v. Dura Corp., 789 F.2d 895, 899 (Fed. Cir. 1986), a royalty for damages was calculated based on an analysis of the business plan of the infringer prepared just prior to the onset of the infringing activity. The court discovered the profit expectations from using the infringed technology of the infringer by review of internal memorandums written by top executives of the company. Internal memorandums showed that company management expected to earn gross profit margins of almost 53% from the proposed infringing sales. Operating profit margins were then calculated by subtracting overhead costs to yield an expected profit margin of between 37% and 42%. To find the portion of this profit level that should be provided as a royalty to the plaintiff, the court considered the standard, *normal*, profits earned in the industry at the time of infringement. These profit levels were determined to be between 6.6% and 12.5%. These normal industry profits were considered to represent profit margins that would be acceptable to firms operating in the industry. The remaining 30% of profits were found to represent a reasonable royalty from which to calculate infringement damages. On appeal, the Federal Circuit affirmed.

The Analytical Approach is a profit differential calculation where the profits derived from use of the infringed technology are subtracted from the profits that would be expected without access to the technology. The difference is attributed to the infringed technology and is considered by some as an indication of a royalty.

Normal Industry Profits

A problem with the analytical approach centers on answering the question, *What is a normal industry profit margin?* Normal is hard to quantify. It is meant to reflect the profit margins that might be gained from operating the businesses in an industry absent the technology in question. It can also be difficult to find agreement on what constitutes normal profit margins for an individual company. Different subsidiaries, divisions and even different product lines within the same company can display wide swings in profitability. Many large companies have a portfolio of businesses. Some of the product offerings are mature products which enjoy large market shares but contribute only moderate profit margins because of selling price competition. Other product offerings are emerging products that have great potential for profits and market share but won't deliver earnings contribution until a later date. Still other products of the same diversified company might contribute huge profits because of a technological advantage but only from exploitation of a small market niche.

A More Comprehensive Analytical Approach

Missing from the analytical approach is consideration of the amount of complementary assets required for exploitation of the subject intellectual property. A unique intellectual property might require significantly more investment in manufacturing assets than is typical for an industry. As such, the industry standard profit margin might be inappropriate. From another viewpoint, the industry profit requirement for commercializing specific intellectual property requiring massive fixed asset investment might be higher than the profits typically required in a specific industry. This could easily happen if new intellectual property is being introduced into an industry not accustomed to capital intensive activities.

The analytical approach loses sight of the balance sheet. Profits are important but they are not independent of investment in complementary business assets as previously discussed. Otherwise, everyone with an idea would be in business. The profit and loss statement is derived from the management of the investment in the assets reported on the balance sheet. Exploitation of intellectual property requires the integration of different types of resources and assets. Intellectual property by itself rarely spews forth money. The equation of commercialization requires working capital, fixed assets, intangible assets and intellectual property. A more comprehensive version of the analytical approach should be utilized — enhanced to the extent that the profits to be allocated between the licensor and licensee reflect the dynamic relationship between profits and the amounts invested in the complementary assets.

A company that produces a commodity product is by definition in a competitive environment. The product price is impacted by heavy competition and profits margins are thin. In such an environment an efficient market will eventually stabilize the pricing of the commodity product to a level that allows participants in the market to earn a fair rate of return on the assets invested in the business but no more. A fair return would be earned on the working capital, fixed assets and intangible assets but excess profits are not typically earned from the production and sale of a commodity product.

A company producing an enhanced product, using proprietary technology, possesses elements of product differentiation that allow the producer to charge a premium price. The premium might be due to a trademark that consumers associate with quality. Alternatively, the premium might be derived from special utility offered by the product covered by patented technology. The price premium might even be derived from a combination of trademark and technological advantages. The producer of the enhanced product would earn a profit that represents a fair return on its working capital, fixed assets, intangible assets and an excess return from the intellectual property. The most amount of royalty that a commodity product producer should be willing to pay for license rights to manufacture and sell the enhanced product is the amount of excess profits associated with the intellectual property. The commodity product licensee would expect to continue to earn a fair rate of return from its investment in working capital, fixed assets and intangible assets.

The investment returns earned by a commodity product manufacturer on the complementary assets used to manufacture and sell the commodity product can be equated to the normal or standard industry profits. When this amount is subtracted from the total returns earned from commercializing the enhanced product, the difference represents the amount contributed by the intellectual property.

> The Analytical Approach can work well when the normal industry profit is derived from analysis of commodity products. The analysis requires that the benchmark commodity profit margin be derived from products competing in the same, or similar, industry as the infringing product, for which a reasonable royalty is being sought. The benchmark profits should also reflect similar investment requirements in complementary assets; similar to those required to exploit the enhanced product which is based on the infringed intellectual property. The following equation can provide a reasonable royalty if the above conditions are met:

Enhanced Product Profit Margin	–	Commodity Product Profit Margin	=	Royalty Rate

HYPOTHETICAL EXAMPLE

Presented in Figure 7 are the profit margins expectations of Exciting Biotech, Inc. associated with commercialization of a new patented drug therapy. The average expected profit margin is 62%. By subtracting the enhanced operating profit margins from an industry *norm* the portion of profits that can be attributed to proprietary technology are isolated as a royalty rate.

Presented in Figure 8 are the operating profit margins for a group of generic drug companies that arguably are producing commodity products. The products are competitively priced, mass produced, widely distributed and provide their makers with lower profit margins in comparison to proprietary products. The profit margins were derived from information downloaded from the Disclosure database on public corporations via CompuServe. Adjustments were incorporated into the operating profit margins to attempt to isolate the profits derived from the operations of the selected companies. Adjustments were made to eliminate income and expenses associated with non-operating assets and non-recurring events when possible. Interest expenses were also eliminated. As a group, the average profit margins of these companies can be looked at as the commodity profit margin for the generic drug industry. In this case we have looked to estimate a *normal* or *commodity* profit margin by looking at the operating profit margins of companies in the business of manufacturing and selling generic drugs. The operating profit margins of several large generic drug manufacturers are presented in Figure 8. The profit margins of the companies are derived from participation in the drug industry without the benefit of patent protection.

Figure 7

New Product Revenue Forecast - 1996 Exciting Biotech, Inc. ($millions)										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Primary Market Revenues	0	0	100	300	400	550	600	625	650	675
Net Income Before Tax	-25	0	80	150	225	350	375	385	395	400
Profit Margin	deficit	0%	80%	50%	56%	64%	63%	62%	61%	59%
Average Profit Margin 98-05	62%									

Figure 8

Generic Drug Company Average Operating Profit Margins		
Company	Profit Margin	Period Averaged
Barr Labs	10.50%	90-95
Biocraft Labs	10.70%	89-95
Copley Pharmaceuticals	38.60%	89-94
IVAX Corp.	15.20%	89-94
Mylan Labs	31.20%	89-95
Pharmaceutical Resources	16.00%	92-94
Purepac Inc.	28.00%	91-94
Watson Pharmaceuticals	34.00%	89-94
Group Average	23.03%	

The group average gives equal weight to each company average. Company averages are not weighted by volume.

Operating profit margins were calculated as: net sales *minus* cost of goods sold and selling and administration expenses, *before* research and development and interest expenses.

The primary source of the financial information used to calculate the profit margins was the Disclosure computer database accessed through Compuserve.

The average operating profit margins reported above were calculated for the years indicated in column 3 to reflect profits most relevant to the hypothetical negotiation date. The periods selected were based on the availability of data and the adjustement of loss years in order to reflect a normalized level of profits for each generic drug company.

The average for Barr Labs reflects adjustments for elimination of profits associated with the Tamoxifen product and costs associated with non-recurring events.

The average for IVAX reflects adjustments for eliminating non-drug product lines.

The average for Pharmaceutical Resources excludes years prior to 1992 due to losses associated with restructuring Par Pharmaceuticals.

Information about the profits of Purepac, Inc. prior to 1991 are not meaningful because the company was in a start-up mode.

The Analytical Approach indicates a royalty rate of 39% as calculated by subtracting the 23% generic drug company profit margin from the 62% profit margin expected by Exciting Biotech, Inc. from commercialization of the new proprietary invention.

Generic Drug Pricing

Additional information that supports this level of royalty rate is developed from considering the price differential between proprietary drugs under patent protection and the same product sold as a generic drug after patent protection expires. The primary difference is the loss of patent protection. The following information indicates the enormous value of patent protection.

> In a story about drug pricing Business Week reported that the patent protection for the ulcer drug Tagamet is about to expire and "Mylan Laboratories is planning a clone of Tagamet for half the price".[7] This represents a 50% discount off the price of the product while under patent protection. In the same story Business Week said "Gross margins for generics are 50% to 60%, vs. 90% to 95% for branded products..." The profit differential indicates a royalty rate under The Analytical Approach of between 30% to 45%.[8]
>
> Business Week also discussed a new strategy being followed by the proprietary drug companies.[9] Faced with huge market share losses when a proprietary drug loses patent protection these companies are introducing their own versions of generic copies of their proprietary drugs. Business Week said "The majors often price generics at only 10% to 25% less than the brand-name price, while generics ideally should be half [50%] the full price.
>
> Forbes reported that patent protection for Naprosyn, a $500 million (1992 annual sales) arthritis drug made by Syntex expired in December 1993.[10] Prior to the loss of patent protection the company introduced in October 1993 a generic version of the drug to try to ease the loss of its market share. A few months after the launch of Syntex' s generic version five other generic drug companies entered the market. Forbes said "Soon the generics were selling at one-tenth [10%] of Naprosyn and had over 80% of the market". A royalty rate of 90% is indicated by this information.
>
> Pharmaceutical Business News, a medical and health industry publication, reported "Generic drugs typically cost 30 per cent to 50% less than their brand-name counter-parts".[11]
>
> Chemical Marketing Reporter a pharmaceutical industry publication, reported, "Industry analysts agree that brands will continue to be new drug innovators and generics will provide off-patent copies at one-fifth [20%] to one-half of the price [50%]".[12]

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[7] "A Big Dose of Uncertainty - An industry plagued by high costs faces health-care reform", Business Week, January 10, 1994, page 85.

[8] ibid.

[9] "The Drugmakers vs. The Trustbusters", Business Week, September 5, 1994, page 67.

[10] "Drug wars", Forbes, August 29, 1994, page 81.

[11] "Market forces usher in a golden age of generic drug", Pharmaceutical Business News, November 29, 1993, published by Financial Times Business Information, Ltd., London, UK.

[12] "Into the mainstream (greater cooperation between generic drug and name-brand drug makers)", Chemical Marketing Reporter, March 9, 1992, Schnell Publishing Company, Inc.

COMPARABLE LICENSE TRANSACTIONS

Indications of reasonable royalties can sometimes be derived from market transactions centered on similar technology. The amount at which independent parties licensed similar intellectual property can sometimes provide an indication for a reasonable royalty. Market transactions considered useful for deriving reasonable royalties are usually between unrelated parties where intellectual property is the focal point of the deal. When a market transaction centers on intellectual property, similar to the subject property, the royalty terms of the transaction may be appropriate for application to the subject property.

Transactions most often cited as useful indications for reasonable royalties are license agreements, which disclose the compensation terms for other licenses involving the intellectual property being studied. As an alternative, an analysis of licensing transactions involving *similar* intellectual property is often relied on for deriving reasonable royalties. Very often license agreements involving similar intellectual property just do not exist. When such agreements are actually discovered there isn't any guarantee that the parties involved will be eager to disclose specific details that would be useful for comparative purposes. Even if all of the specific details of a comparable transaction can be discovered many hurdles remain to be successfully jumped before the market transaction can be considered as a reliable indication of a reasonable royalty for application to a specific case.

Many aspects of market transactions must be studied closely before a specific transaction can be concluded as representing a reasonable royalty for comparison purposes. The remainder of this section considers the appropriateness of using unrelated license agreement royalty terms as a proxy for a subject case when analyzing similar intellectual property licenses.

Internal Licenses Are Often Self-serving

Multinational corporations often transfer intellectual property to foreign subsidiaries. Parent companies often own keystone intellectual property and their subsidiaries hold licenses allowing them to use the property. These licenses are referred to as internal licenses. They had not usually been reliable market transactions for deriving reasonable royalties. Many of the royalty terms in these types of transactions were structured to shift income into jurisdictions with lower income tax burdens. Hence the royalty rate did not reflect the economic contribution of the intellectual property but reflected the differential corporate income tax rates between a multi-national corporate parent and a foreign subsidiary. Internal licenses were missing a fundamental element because the royalty terms were not established by arms-length negotiation where each party to the transaction argued their self interests. Royalties specified in internal licenses were clouded by many other self-serving issues. This is beginning to change. International taxing authorities are looking at transfer pricing issues and intellectual property is getting close scrutiny. Many corporations are commissioning studies to use as the basis of their intellectual property pricing. These studies are based on market transactions and the investment rate of return analyses explored later in this book. As more corporations set internal transaction pricing in-line with third-party transaction pricing internal licenses will become useful indications of royalty rates.

Relevant Time Period

The price paid for a stock in the past is an interesting notation but has little to do with a current pricing analysis. The same is true when corporations engage in mergers and acquisitions. The prices at which businesses are exchanged seldom relate to amounts at which prior transactions were consummated. When considering the purchase of an investment real estate property a lot of analysis goes into determining the price to offer. Included are consideration of prevailing interest rates, inflation, rental income, operating expenses, property taxes and income taxes. All of these considerations are analyzed from the perspective of quantifying future expectations about profits and return on investment. Very little, if any, consideration is given to the price at which the property has historically changed hands. Manhattan Island was originally purchased from the original owners for $24 worth of novelty trinkets. Historic transaction prices are interesting footnotes but not usually relevant for current transaction pricing. It' s no different for intellectual property. A reasonable royalty must be based on future expectations that both the licensee and the licenser individually possess and which eventually converge as negotiations reach a conclusion. Reasonable royalties must be determined with an eye to the future. The amount paid years ago for licensing intellectual property is not often relevant.

Financial Condition of Both Licensing Parties

When one of the parties in a similar license is desperate to complete the transaction the amount paid for the license is clouded. A nearly bankrupt licenser may not have enough time to shop for the best offer and could leave a significant amount of money on the negotiating table. On the other hand, a manufacturing company with obsolete technology may find itself going out of business without access to new technology. A fair and reasonable royalty is best determined in an environment where both of the negotiating parties are on equal footing. Both parties should have the option to walk away from the deal. When ancillary forces are compelling one of the negotiating parties to capitulate to the demands of the other then a fair and reasonable royalty may be not indicated in such a license agreement.

Relevant Industry Transactions

Some licenses may involve property that is similar to a specific property under negotiation but the property is licensed for use in a different industry. To be useful for deriving a fair market royalty a proxy royalty rate must have been negotiated for similar property that is used in a similar industry. Each industry has its own set of unique economic forces. Some are highly competitive like consumer electronics. Others are oligopolies like airlines. Some industries are sensitive to interest rates - construction. Others are not - food. Some industries are under strong pressure from foreign producers - apparel. Others are only regionally competitive - gravel quarries. All of these factors drive the profitability and growth prospects of the industry participants. These factors also impact the amount of economic benefits that intellectual property can contribute to a commercial operation which directly relates to the royalties that can be considered reasonable.

International Transactions

In developing nations where intellectual property protection is weak the amount paid for a license would likely be far less than in developed nations where intellectual property rights are protected and respected. This assumes that an intellectual property owner would even consider allowing for the use of its property in such countries. A low rate in developing nations reflects that exclusive use of the property may not be realistic regardless of what the license agreement says. A low royalty in some countries might also reflect differences in governmental regulation, inflation, and general economic conditions. As such, license agreements in different countries might possess different royalty rates for the same intellectual property, none of which may be relevant for a specific case depending on the country into which the technology in question is being licensed.

Intellectual Property Remaining Life

The remaining time during which economic benefits are expected to continue being contributed by intellectual property is important to the level at which royalties will be paid. Remaining lives of a short duration are likely to be associated with low royalties. Long remaining lives are typically associated with higher royalties, all other things being equal. The required investment in complementary assets (working capital and fixed assets) is the primary reason for the relationship between royalty rates and remaining lives. Licensees must usually invest in complementary assets in order to fully exploit intellectual property. The future cash flows from exploitation must therefore provide for a return on the complementary investment. Exploitation of the intellectual property must also allow for enough earnings to be generated to recapture the initial investment in complementary assets. Significant up-front investments may take a long time to recapture. If the remaining life of intellectual property is short, then more of the earnings from exploitation must be allocated to recapturing the initial investment and less is available for royalties. In cases where up-front investments are negligible the level of royalties will not likely be as sensitive to the remaining life of the intellectual property. Cases where exploitation requires insignificant up-front investments are in the minority.

Non-monetary Compensation

Compensation for the use of intellectual property can take many different forms. Sometimes cash alone is the basis of licensing compensation. A cash payment is made by the licensee and no further payments are required. Lump sum payments with additional running royalties are another example of license compensation. Running royalties alone are another example. Sometimes the licenser gets a royalty and also an equity interest in the licensee' s company. Sometimes the licenser gets only an equity interest. License agreements can also call for the licensee to share technological enhancements, as grant-backs, with the licenser. In return the licensee might demand a lower royalty rate because a portion of the licenser's compensation will be in the form of access to enhancements of the original property. For similar license agreements to be used as a proxy for derivation of a fair royalty rate, the form of license compensation must be on a like-kind basis.

Exclusivity

What should the basis of reasonable royalties be regarding the aspect of exclusivity? Typically, higher royalty rates are associated with license agreements providing the licensee with exclusive rights to use the intellectual property. Exclusive rights to use a keystone intellectual property places the licensee in a superior position. If the intellectual property provides highly desirable utility, then premium prices can be demanded for the product. Competitors cannot counter with the same product without risking infringement and the exclusive licensee will earn superior profits. Such an arrangement is worth higher royalty payments. DuPont recently renegotiated a license involving worldwide and exclusive rights to a drug patent. Later the agreement was changed to a non-exclusive basis. As a result the royalty dropped by 27%.

Technical Assistance from the Licensor

Very often market transactions include technical assistance. Incorporated into the license agreement are compensation terms for the value of the expected technical assistance. When a separate amount is identified as being compensation for technical assistance then the remaining amount of compensation can be associated with the royalty for utilization of the licensed intellectual property. Sometimes however the technical assistance compensation is part of the overall running royalty specified in the agreement. Unfortunately, an allocation of the royalty, such as 20% for technical assistance and 80% for the underlying intellectual property, is not always defined. When using market licenses as a proxy for deriving a fair market royalty the compensation for the underlying technology must be the focal point.

Package Licenses

Licenses don't always grant use of one specific item of intellectual property. Several patents may be granted as a group with one royalty rate specified as compensation for all of the property. Sometimes patents and trademarks are licensed together for a single royalty. Sometimes they are licensed separately. A problem of comparability arises however when licenses that are used for comparison cover not only a similar patent but also grant use of other property not pertinent to the subject analysis.

Old License Deals Seldom Reflected Return on Investment

Intellectual property is fast being recognized as a strategic asset of enormous value. It is finally being considered in the same category as high-quality investment assets. Transactions involving a transfer of rights to use these assets are based more than ever on thorough financial analyses. Return on investment analysis is becoming fundamental to decisions about intellectual property exploitation strategies and to royalty negotiations. The history of licensing and royalty rate negotiations is not however founded on investment analysis. Sophisticated analysis of intellectual property has evolved slowly. Initially, licensing intellectual property was not looked on as a primary source of intellectual property exploitation. It was often just an enjoyable byproduct of owning such property. The task of licensing intellectual property originally fell into the laps of intellectual property attorneys. Patent lawyers and trademarks lawyers were among the first at major corporations to become involved with intellectual property licensing. These were the same highly skilled professionals that were primarily responsible for the legal existence of these valuable properties. It was logical to charge them with the complex legalities of licensing. In almost all aspects of licensing transactions, relying on a knowledgeable intellectual property lawyer is very prudent. Unfortunately, the responsibility for determining compensation should have been located elsewhere. Compensation should be based on independent quantitative analysis customized to address specific circumstances. Lawyers are however diligently trained to find answers to complex questions in the form of precedents. What have others received in similar transactions. As discussed throughout this paper, investment analysis is the key to quantifying proper intellectual property compensation. Searching for royalties that were negotiated on the basis of precedents is not likely to yield an appropriate royalty rate. Yet this is the basis of the royalty terms that complete many older license agreements - two lawyers negotiating at peak performance but both using precedents as guidance instead of investment analysis. Older licenses are therefore less relevant in a more sophisticated climate that now relies on investment analysis for deriving royalty terms.

Comparative Analysis Summarized

Comparative analysis of similar technology licenses can be very useful for negotiating royalty rates but many aspects of the license agreement must be analyzed for a royalty provision to be a useful proxy. In a perfect world a useful proxy license for establishing a fair market royalty would:

1) not be an internal license between a parent corporation and a subsidiary[13];

2) have been negotiated at a date that is relevant to the date of the subject analysis;

3) have been negotiated between two independent parties, neither of which were compelled to complete the transaction because of financial distress;

4) involve similar intellectual property licensed for use in the same industry in which the fair market royalty is desired;

5) transfer license rights for use of similar intellectual property into a country having similar economic conditions as the country in which the fair royalty is desired;

6) involve similar intellectual property with similar remaining life characteristics;

7) require similar complementary asset investment requirements for commercial exploitation;

8) specify royalty terms that are not clouded by non-monetary components of compensation;

9) include comparable aspects of exclusivity;

10) include royalty terms that were freely negotiated and unencumbered by governmental regulations;

11) specify royalty terms that are not clouded by undefined amounts that are indirectly attributed for technical assistance compensation.

INVESTMENT RATE OF RETURN ANALYSIS

Important negotiations deserve thorough analyses. This last section presents an approach for determining a royalty rate based on investment rate of returns. This analysis requires consideration of the profits expected from exploitation of the various assets of a business including the technology that will be licensed. By allocating a fair rate of return to all of the integrated assets of a business, including the licensed technology, a fair rate of return for use of a specific patent can be derived and expressed as a royalty rate.

[13] As previously mentioned this problem is slowly being resolved as multinational corporations bring their internally specified royalty rates in-line with third-party transactions.

The basic principles in this type of analysis involve looking at the total profits of a business and allocating the profits among the different classes of assets used in the business. When a business demonstrates an ability to earn profits above that which would be expected from operating a commodity oriented company then the presence of intellectual property, such as patented technology is identified. An allocation of the total profits derived from using all assets of the company can attribute a portion of the profits to the technology of a business. When the profits attributed to technology are expressed as a percentage of revenues, royalty rate guidance is obtained.

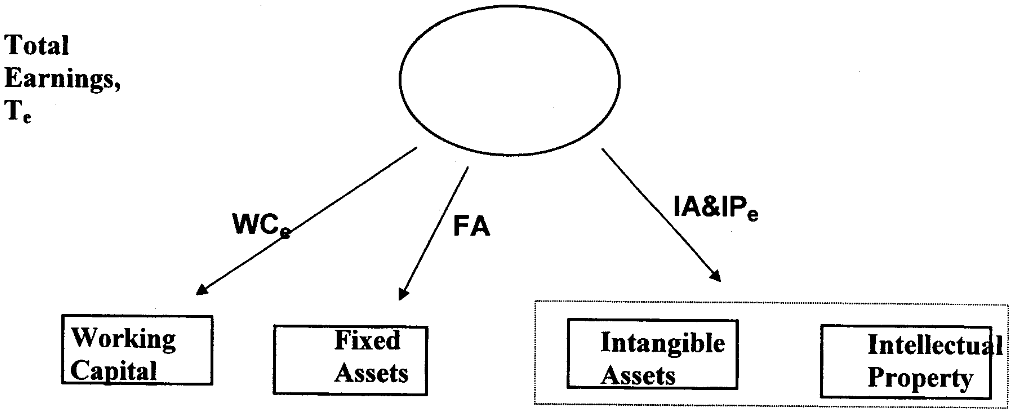
The investment rate of return analysis yields an indication of a royalty rate for a technology license after a fair return is earned on investment in the other assets of the business. Thus, a royalty rate conclusion that is supported by an investment rate of return analysis allows for payment of a royalty to a licensor while still allowing a licensee to earn a fair investment rate of return on its own, non-licensed assets, that are used in the business.

Investment Rate of Return Royalty Rates

This section of the chapter explores the use of advanced financial analysis techniques to derive royalty rates. The method is based on the idea of allocating the total earnings of a technologically based business among the different asset categories employed by the business. Figure 9 starts with the concepts introduced earlier and add notations that will be used in the following paragraphs to develop the method.

The earnings of a business are derived from exploiting its assets. The amount of assets in each category along with the nature of the assets, and their quality, determines the level of earnings that the business generates. Working capital, fixed assets and intangible assets are generally commodity types of assets that all businesses can possess and exploit. As previously discussed, a company that possesses only these limited assets will enjoy only limited amounts of earnings because of the competitive nature of commodity-dominated businesses.

Figure 9
Distribution of Earnings



A company that generates superior earnings must have something special - intellectual property in the form of patented technology, trademarks or copyrights. The distribution of the earnings among the assets is primarily driven by the value of the assets and the investment risk of the assets. The total earnings of the company (T_e) as expressed below, are comprised of earnings derived from use of working capital (WC_e), earnings derived from use of fixed assets (FA_e) and earnings derived from use of intangible assets and intellectual property ($IA\&IP_e$).

$$T_e = WC_e + FA_e + IA\&IP_e$$

The earnings associated with use of intangible assets and intellectual property are represented by $IA\&IP_e$. This level of earnings can be further subdivided into earnings associated with the use of the intangible assets (IA_e) and earnings associated with the use of intellectual property (IP_e) as shown below:

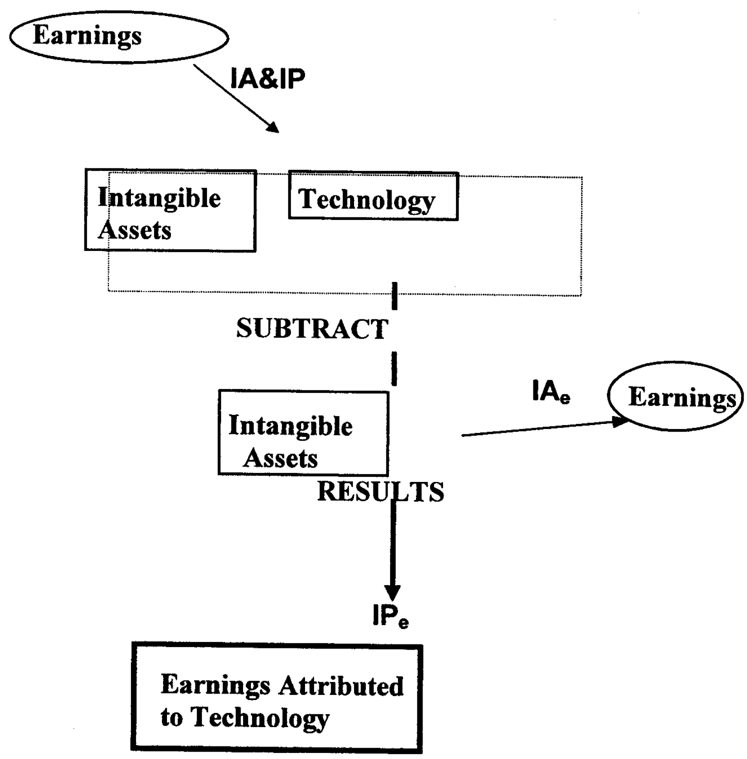
$$IA\&IP_e = IA_e + IP_e$$

Royalty Rates

An appropriate royalty rate is equal to the portion of IP_e that can be attributed to the use of the subject technology. The royalty rate to associate with a specific technology equals the earnings derived from the technology divided by the revenues derived with the technology as shown in Figure 10.

Specifically, a company lacking intangible assets and technology would be reduced to operating a commodity oriented enterprise where competition and lack of product distinction would severely limit the potential for profits. Conversely, a company possessing proprietary assets can throw off the restrictions of commodity oriented operations and earn superior profits.

Figure 10
Excess Earnings as a Percent of Revenues



Earnings Attributed to Technology = Royalty Rate Indication Revenues

When a portion of the profit stream of a company is attributed to the proprietary assets of a company, an indication of the profits contributed by the existence of the proprietary assets is provided and a basis for a royalty is established when the attributed profits are expressed as a percentage of the corresponding revenues. The total profits can be allocated among the different asset categories based on the amount of assets in each category and the relative investment risk associated with each asset category.

Shown on Figure 11 is an allocation of the weighted average cost of capital[14], for an example business enterprise, allocated among the business assets used in the business enterprise. The various rates of return assigned to each of the assets reflect their relative risk. The relative returns provided by each asset category is also indicated.

Figure 11

EXAMPLE COMPANY INC.					
Required Return on					
Intangible Assets & Intellectual Property (IA & IP)					
				Weighted	Allocated
			Required	Required	Weighted
Asset Category	Amount	Percent	Return	Return	Return
Net Working Capital	10,000	10%	7.00%	0.70%	7.7%
Fixed Assets	20,000	20%	11.00%	2.20%	2.0%
IA & IP	70,000	70%	13.85%	9.70%	90.3%
INVESTED CAPITAL	100,000	100%		12.60%	100.0%

Appropriate Return on Monetary Assets

The monetary assets of the business are its net working capital. This is the total of current assets minus current liabilities. Current assets are comprised of accounts receivable, inventories, cash, and short term security investments. Offsetting this total are the current liabilities of the business such as accounts payable, accrued salaries, and accrued expenses. The value of this asset category can usually be taken directly from a company balance sheet.

Working capital is considered to be the most liquid asset of a business. Receivables are usually collected within 60 days and inventories are usually turned over in 90 days. The cash component is immediately available and security holdings can be converted to cash with a telephone call to the firm's broker. Further evidence of liquidity is the use of accounts receivable and/or inventories as collateral for loans. In addition, accounts receivable can be sold for immediate cash to factoring companies at a discount of the book value. Given the relative liquidity of working capital, the amount of investment risk is inherently low. An appropriate rate of return to associate with the working capital component of the business enterprise is that which is available from investment in short term securities of low risk levels. The rate available on 90 day certificates of deposit or money market funds serves as an appropriate benchmark.

Appropriate Return on Tangible Assets

[14] The weighted average cost of capital is an investment rate of return required from business investments that is a weighting of the rates of return required by debt and equity investors.

The tangible or fixed assets of the business are comprised of production machinery, warehouse equipment, transportation fleet, office buildings, office equipment, leasehold improvements, office equipment and manufacturing plants. The value of this asset category may not be accurately reflected on company balance sheets. Aggressive depreciation policies may state the net book value at an amount lower than the fair market value on which a return should be earned. Correction of this problem can be accomplished by estimating fair market value somewhere in between original equipment costs and net book value. A midpoint between the two points is usually a reasonable compromise. Accuracy in this area is not crucial for the drug business. The amount and value of tangible assets used in the industry is usually minor relative to the value of revenues, earnings, markets and the value of the entire business enterprise.

An indication of the rate of return that is contributed by these assets can be pegged at about the interest rate at which commercial banks make loans, using the fixed assets as collateral. While these assets are not as liquid as working capital, they can often be sold to other companies. This marketability allows a partial return of the investment in fixed assets should the business fail. Another aspect of relative risk reduction relates to the strategic redeployment of fixed assets. Assets that can be redirected for use elsewhere in a corporation have a degree of versatility which can still allow an economic contribution to be derived from their employment even if it isn't from the originally intended purpose.

While these assets are more risky than working capital investments, they possess favorable characteristics that must be considered in the weighted average cost of capital allocation. Fixed assets that are very specialized in nature must reflect higher levels of risk which of course demands a higher rate of return. Specialized assets are those which are not easily redeployed for other commercial exploitation or liquidated to other businesses for other uses.

Appropriate Return on Intangible Assets and Intellectual Property

Intangible assets can be considered to be the most risky asset components of the overall business enterprise. These assets may have little, if any, liquidity and poor versatility for redeployment elsewhere in the business.[15] This enhances their risk. Customized computer software for tracking the results of clinical studies may have very little liquidation value if the company fails. The investment in trained employees that know how to get government approvals may be altogether lost and the value of other elements of a going concern are directly related to the success of the business. A higher rate of return on these assets is therefore required.

An appropriate investment rate of return is then derived, and assigned to the intangible assets and intellectual property of the business, including the infringing technology, by using the weighted average cost of capital for the business, the return on fixed assets deemed appropriate and the return on working capital deemed appropriate. The earnings associated with the intellectual property and intangible assets of the company are then calculated as depicted in Figure 11. Conversion of these earnings into a royalty rate can be accomplished by dividing the earnings by the associated revenues

[15] The liquidity of intellectual property is starting to change. Recently, music copyrights served as the basis for investment securities when the pop-song artist David Bowie pledged a large collection of music copyrights and the royalties they generate as the foundation for bonds.

Figure 11 tells us that over 90% of the profits of Example Company, Inc. are derived from intangible assets and intellectual property. If Example Company shows operating profits of 20% on sales, then 18% of sales should be attributed to intangible assets and intellectual property. Depending on the characteristics of the subject technology, it may deserve to have the majority of the 18% attributed to its contribution to the business. The final allocation requires considering the amount, types and importance of other intellectual property used in the business. The royalty just derived may include earnings derived by the business from exploitation of intellectual property and intangible assets unrelated to specific technology.

Royalty Rate for the Specific Patented Invention

The next step is to answer the following question - *How much of a royalty rate should be subtracted from the derived 18% royalty rate to isolate the portion that is attributable to only the subject patents?* It must be remembered that the 18% rate is for all of the intangible assets and intellectual property possessed by Example Company, Inc. including use of the subject patented invention?

The answer to this question can be estimated by focusing on a company that operates in a similar industry and possesses most of the intangible assets possessed by a typical personal computer company. However the selected company must be one that does not possess or use the subject proprietary and patented inventions. By duplicating the same analysis presented in Figures 6.3 for a surrogate company we can isolate the amount of income to associate with all intangible assets and intellectual property *except* for the subject patent. When this analysis was concluded the royalty rate to associate with everything other than the subject patent was 10%. The difference between this rate and the 8.4% is the royalty rate to associate with the subject patent – 8%:

Example Company, Inc.
Royalty Rate for
Patented Therapeutic Drug

Investment Rate of Return Associated with all Intangible Assets and Intellectual Property of Example Company, Inc. *Including* the Patented Therapeutic Drug

MINUS

Investment Rate of Return Associated with all Intangible Assets and Intellectual Property of Surrogate Pharmaceutical Companies *Excluding* the Patented Therapeutic Drug

EQUALS

Royalty Rate Associated with the Patented Technology

When IP_e includes earnings from non-licensed intellectual property, another step is needed to develop a proxy for earnings that represent the contribution from the non-infringing IP_e. Attribution of earnings for intangible assets can be accomplished by an investment rate of return analysis that derives a royalty for a company that possesses intangible assets but not technology. These earnings can serve as a proxy for the intangible assets earnings of the subject company. When they are subtracted from the earnings associated with $IA\&IP_e$ then only the earnings for IP_e are left. When these remaining earnings are converted to a royalty, then a royalty rate for use of specific technology is indicated.

<u>Benefits of an Investment Rate of Return Analysis</u>

An investment rate of return analysis enhances royalty rate determination models by:

1. Considering the investment risk associated with the business and industry environment in which the licensed technology will be used.

2. Reflects specific commercialization factors associated with the licensed technology as embedded in forecasts associated with sales, production costs and operating expenses.

3. Allows for an investment return to be earned on the fixed assets used in the business

4. Allows for an investment return to be earned on the working capital assets used in the business.

5. Allows for an investment return to be earned on the other intangible assets and intellectual property used in the business *other than* the subject patent.

DISCOUNTED CASH FLOW ANALYSIS

A variation of the investment rate of return analysis can also be used for royalty rate derivation. This alternate method makes use of a discounted cash flow analysis, which converts a stream of expected cash flows into a present value. The conversion of expected cash flows is accomplished by using a discount rate reflecting the riskiness of the expected cash flows. In addition to the benefits just listed from using an investment rate of return analysis, the discounted cash flow analysis also reflects the:

- Time period during which economic benefits will be obtained.
- Timing of capital expenditure investments.
- Timing of working capital investments
- Timing and amount of other investments in intellectual property and intangible assets not associated with the subject technology.

The basis of all value is cash. The net amount of cash flow thrown off by a business is central to corporate value. Net cash flow - also called free cash flow - is the amount of cash remaining after reinvestment in the business to sustain continued viability of the business. Net cash flow can be used for dividends, charity contributions or diversification investments. Net cash flow is not needed to continue fueling the business. Aggregation of all future net cash flows derived from operating the business, modified with respect to the time value of money, represents the value of a business. A basic net cash flow calculation is depicted below:

NET SALES minus
MANUFACTURING COSTS equals
GROSS PROFITS

GROSS PROFITS minus
RESEARCH EXPENSES and
MARKETING EXPENSES and
GENERAL OVERHEAD EXPENSES and
ADMINISTRATION EXPENSES and
SELLING EXPENSES equal
OPERATING PROFITS

OPERATING PROFITS minus
INCOME TAXES equals
NET INCOME

NET INCOME plus
DEPRECIATION equals
GROSS CASH FLOW

GROSS CASH FLOW minus
ADDITIONS TO WORKING CAPITAL and
ADDITIONS TO FIXED PLANT INVESTMENT equals
NET CASH FLOW

Sales represent the revenue dollars collected by the company from providing products or services to customers. Net sales are the amount of revenues that remain after discounts, returns and refunds.

Manufacturing costs are the primary costs associated with making or providing the product or service. Included in this expense category are expenses associated with labor, raw materials, manufacturing plant costs and all other expenses directly related to transforming raw materials into finished goods.

Gross profit is the difference between net sales and manufacturing costs. The level of gross profits reflects manufacturing efficiencies and a general level of product profitability. It does not, however, reflect the ultimate commercial success of a product or service. Many other expenses important to commercial success are not accounted for at the gross profit level. Other expenses contributing to successful commercialization of a product include:

- Research expenses associated with creating new products and enhancing old ones.
- Marketing expenses required to motivate customers to purchase the products or service.
- General overhead expenses required to provide basic corporate support for commercialization activities.
- Selling expenses associated with salaries, commissions and other activities that keep product moving into the hands of customers.

Operating profits reflect the amount left over after non-manufacturing expenses are subtracted from gross profits.

Income taxes are expense of doing business and must be accounted for in valuing any business initiative.

Depreciation expense is calculated based on the remaining useful life of equipment that is purchased for business purposes. It is a non-cash expense that allocates the original amount invested in fixed assets. Depreciation is calculated to account for the deterioration of fixed assets as they are used to produce, market, sell, deliver and administer the process of generating sales. Depreciation accounts for the using-up of assets. It is called a non-cash expense because the cash associated with the expense was disbursed long ago at the time that fixed assets were purchased and installed. The depreciation expense is subtracted before reaching operating profit so that income taxes will reflect depreciation as an expense of doing business.

Gross cash flow is calculated by adding the depreciation expense, previously subtracted to calculated operating income, back to the after tax income of the company. Gross cash flow represents the total amount of cash that the business generates each year.

Additions to working capital and additions to fixed plant investment are investments in the business required to fuel continued production capabilities.

Net cash flow is everything that remains of gross cash flow after accounting for the reinvestment in the business for fixed plant and working capital additions.

Value is derived from the net cash flows by converting the expected amounts into a present value using discount rates that reflect investment risk and time value of money as previously discussed in the investment rate of return section of this chapter.

PharmaProd Commodity Corp. Value

Consider the discounted cash flow analysis presented in Figures 12 as a simple example of using discounted cash flow analysis for royalty rate derivation. Figure 12 represents the future net cash flows for PharmaProd Commodity Corp. (imaginary company) as it currently operates. The sales, expenses and earnings for the company reflect the commodity-like nature of the business. Product prices are under pressure from strong competition translating into low profitability. Strong competition also severely limits the opportunity for the company to achieve any substantial growth in the future. The present value calculation contained in Figure 12 shows a value for the company at $10,118,000 using a discount rate of 13%. The calculation of the value of the company includes the present value of the net cash flows expected after year eleven. Constant growth, reflecting inflation and minimal volume growth into perpetuity is captured in the final year discount rate factor used in year eleven. The $10.1 million value equals the aggregate value of all the assets of the company as previously depicted in Figures 3 and 4. This amount indicates that the company has earned its required weighted average cost of capital and an excess present value of $10,118,000.

PharmaProd Commodity Corp. is planning to embark on a major business initiative with the introduction of a new product using new technology and thus changing itself into New PharmaProd Corp. It will continue to offer its commodity product but also add a new proprietary product to its offerings. The technology will be licensed from another company. Figure 13 represents the present value of the company including the net cash flows from the existing operations of the company and the net cash flows from the new product initiative. Additional sales, manufacturing costs and expenses are reflected in the analysis. Also the additions to working capital and fixed assets required for the new product commercialization effort are reflected. Also reflected in the analysis are the research and development expenses needed to prove the technology and obtain FDA approvals.[16] As a result of the initiative the present value of the company increases to $15,593,000.[17] The higher value reflects the added revenues and earnings of the new product at the higher profit margins of the new product. A comparison of Figures 12 and 13 shows that research, marketing, working capital additions and fixed asset additions are all higher and by more than just a proportional share of the higher sales forecasts. This is especially true for the early years in the discounted cash flow analysis because the new product initially does not contribute significant sales volume but definitely has expenses.

New PharmaProd Corp. Royalty Rate

What royalty rate should the company pay for use of the new product technology? The highest amount of royalty the company should be willing to pay for the licensed technology is shown on Figure 14. A royalty of 10.9% of the sales associated with the new product represents a royalty expense to New PharmaProd Corp. and yields a present value of

[16] The time span for many pharmaceutical projects is greater than depicted in this example. For illustrative purposes a short time span has been used.

[17] For simplicity the same discount rate of 13% has been used in Figures 12 though 14. The introduction of the new product initiative might warrant increasing the discount rate as the risk of the company is increased with the introduction of a new product.

$10,118,000 – the initial value of the company. At this royalty the company has earned a return on the additional investment required to commercialize the new product technology and not a penny more. A royalty rate of less than 10.9% would increase the value of the company.

Figure 12
PharmaProd Commodity Corp.
Business Enterprise Value

YEAR		1	2	3	4	5	6	7	8	9	10
Sales		25,000	25,750	26,523	27,318	28,138	28,982	29,851	30,747	31,669	32,619
Cost of Sales		12,500	12,875	13,261	13,659	14,069	14,491	14,926	15,373	15,835	16,310
Gross Profit		12,500	12,875	13,261	13,659	14,069	14,491	14,926	15,373	15,835	16,310
Gross Profit Margin		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Operating Expenses:											
General & Administrative		3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	3,914
Research & Development		0	0	0	0	0	0	0	0	0	0
Marketing		2,500	2,575	2,652	2,732	2,814	2,898	2,985	3,075	3,167	3,262
Selling		5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524
Operating Profit		2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610
Operating Profit Margin		8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Income Taxes		760	783	806	830	855	881	907	935	963	992
Net Income		1,240	1,277	1,316	1,355	1,396	1,437	1,481	1,525	1,571	1,618
Net Profit Margin		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Cash Flow Calculation:											
+ Depreciation		19	38	59	79	101	123	146	169	193	218
- Working Capital Addtns		140	150	155	159	164	169	174	179	184	190
- Capital Expenditures		175	188	193	199	205	211	217	224	231	238
Net Cash Flow		944	978	1,026	1,076	1,128	1,181	1,235	1,291	1,349	1,408
Discount Factor	13%	0.9413	0.8330	0.7372	0.6524	0.5773	0.5109	0.4521	0.4001	0.3541	2.9459
Present Value		888	815	757	702	651	603	558	517	478	4,149

Net Present Value	**10,118**

Figure 13
New PharmaProd Corp.
Business Enterprise Value
with Licensed Technology

YEAR		1	2	3	4	5	6	7	8	9	10
Sales		25,000	25,750	26,523	27,318	28,138	28,982	29,851	30,747	31,669	32,619
Cost of Sales		12,500	12,875	13,261	13,659	14,069	14,491	14,926	15,373	15,835	16,310
New Product Sales		100	1000	4000	8000	10000	11000	12100	13310	14641	15080
New Product Cost of Sales		35	350	1400	2800	3500	3850	4235	4658.5	5124	5278
Gross Profit		12,565	13,525	15,861	18,859	20,569	21,641	22,791	24,025	25,351	26,112
Gross Profit Margin		50.1%	50.6%	52.0%	53.4%	53.9%	54.1%	54.3%	54.5%	54.7%	54.7%
Operating Expenses:											
General & Administrative		3,012	3,210	3,663	4,238	4,577	4,798	5,034	5,287	5,557	5,724
Research & Development		5,000	1,500	0	0	0	0	0	0	0	0
Marketing		2,510	2,675	3,052	3,532	3,814	3,998	4,195	4,406	4,631	4,770
Selling		5,020	5,350	6,105	7,064	7,628	7,996	8,390	8,811	9,262	9,540
Operating Profit		(2,977)	790	3,042	4,025	4,551	4,849	5,171	5,521	5,901	6,078
Operating Profit Margin		-11.9%	3.1%	11.5%	14.7%	16.2%	16.7%	17.3%	18.0%	18.6%	18.6%
Income Taxes		(1,131)	300	1,156	1,530	1,729	1,842	1,965	2,098	2,242	2,310
Net Income		(1,846)	490	1,886	2,496	2,822	3,006	3,206	3,423	3,659	3,768
Net Profit Margin		-7.4%	1.9%	7.1%	9.1%	10.0%	10.4%	10.7%	11.1%	11.6%	11.6%
Cash Flow Calculation:											
+ Depreciation		368	387	408	428	450	472	495	518	542	567
- Working Capital Additions		160	330	755	959	564	369	394	421	451	278
- Capital Expenditures		3,665	188	193	199	205	211	217	224	231	238
Net Cash Flow		(5,303)	360	1,346	1,766	2,503	2,898	3,090	3,296	3,520	3,820
Discount Factor	13%	0.9413	0.8330	0.7372	0.6524	0.5773	0.5109	0.4521	0.4001	0.3541	2.9459
Present Value		(4,992)	300	992	1,152	1,445	1,481	1,397	1,319	1,246	11,253
Net Present Value		**15,593**									

Figure 14
New PharmaProd Corp.
Business Enterprise Value
with Licensed Technology and a Royalty Payment

YEAR		1	2	3	4	5	6	7	8	9	10
Sales		25,000	25,750	26,523	27,318	28,138	28,982	29,851	30,747	31,669	32,619
Cost of Sales		12,500	12,875	13,261	13,659	14,069	14,491	14,926	15,373	15,835	16,310
New Product Sales		100	1000	4000	8000	10000	11000	12100	13310	14641	15080
New Product Cost of Sales		35	350	1400	2800	3500	3850	4235	4658.5	5124	5278
Gross Profit		12,565	13,525	15,861	18,859	20,569	21,641	22,791	24,025	25,351	26,112
Gross Profit Margin		50.1%	50.6%	52.0%	53.4%	53.9%	54.1%	54.3%	54.5%	54.7%	54.7%
Operating Expenses:											
Royalty	**10.9%**	**11**	**109**	**437**	**873**	**1,092**	**1,201**	**1,321**	**1,453**	**1,598**	**1,646**
General & Administrative		3,012	3,210	3,663	4,238	4,577	4,798	5,034	5,287	5,557	5,724
Research & Development		5,000	1,500	0	0	0	0	0	0	0	0
Marketing		2,510	2,675	3,052	3,532	3,814	3,998	4,195	4,406	4,631	4,770
Selling		5,020	5,350	6,105	7,064	7,628	7,996	8,390	8,811	9,262	9,540
Operating Profit		(2,988)	681	2,605	3,152	3,460	3,648	3,850	4,068	4,303	4,432
Operating Profit Margin		-12.0%	2.6%	9.8%	11.5%	12.3%	12.6%	12.9%	13.2%	13.6%	13.6%
Income Taxes		(1,135)	259	990	1,198	1,315	1,386	1,463	1,546	1,635	1,684
Net Income		(1,853)	422	1,615	1,954	2,145	2,262	2,387	2,522	2,668	2,748
Net Profit Margin		-7.4%	1.6%	6.1%	7.2%	7.6%	7.8%	8.0%	8.2%	8.4%	8.4%
Cash Flow Calculation:											
+ Depreciation		368	387	408	428	450	472	495	518	542	567
- Working Capital Additions		160	330	755	959	564	369	394	421	451	278
- Capital Expenditures		3,665	188	193	199	205	211	217	224	231	238
Net Cash Flow		(5,310)	292	1,075	1,225	1,826	2,154	2,271	2,396	2,529	2,799
Discount Factor	13%	0.9413	0.8330	0.7372	0.6524	0.5773	0.5109	0.4521	0.4001	0.3541	2.9459
Present Value		(4,998)	243	793	799	1,054	1,100	1,027	958	895	8,247

Net Present Value	**10,118**

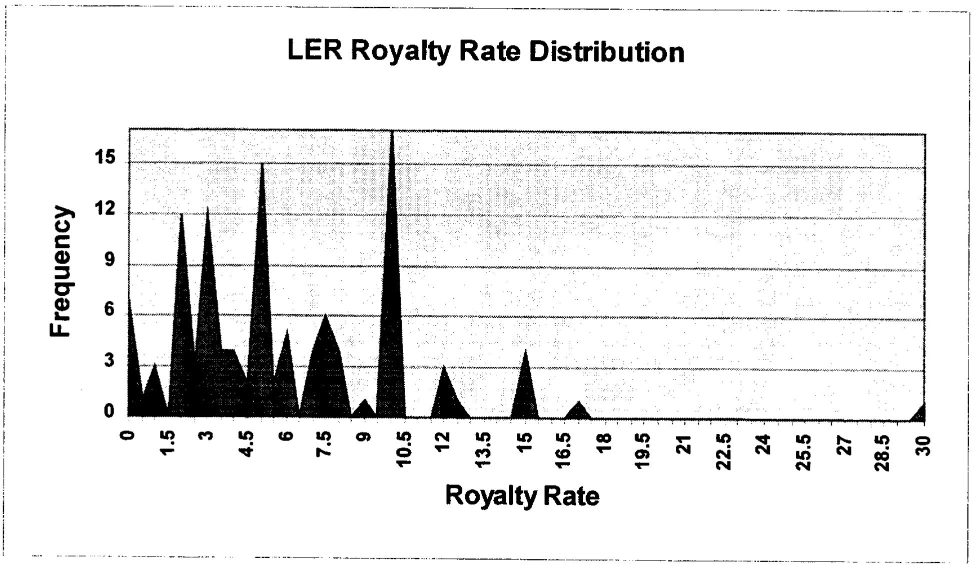
REAL WORLD ROYALTY RATES

Up to this point we have been discussing methods to quantify royalty rates by means of quantitative analysis. Information about the actions of independent parties engaged in real world negotiations is also helpful for judging the reasonableness of the results derived from analytical methods. Royalty Rates for Technology is a new book that represents a comprehensive collection of technology pricing information. The stories presented in the book are compiled from past issues of Licensing Economics Review (LER) beginning with the first issue in September 1990 and running through December 1996. The information in this report is categorized by the following industries:

Industries

Aeronautics	Computer Hardware	Entertainment	Household Products	Semi-conductors
Agriculture	Computer Software	Financial	Mechanical	Sports
Automotive	Construction	Food	Medical	Steel
Chemistry	Electrical	Franchises	Natural Resources	Toys
Communications	Electronics	Glass	Photography	Waste Treatment

The chart below summarizes royalty rates across a number of industries. The royalty rates reported are grouped by rate and graphed by the frequency of their appearance, providing the following distribution.



Source: Royalty Rates for Technology; www.ipresearch.com

A CUMULATIVE ANALYSIS OF THE SAME INFORMATION PROVIDES THE FOLLOWING INSIGHT:

34% of the royalty rates are 3% or less,
41% of the royalty rates are 4% or less,
56% of the royalty rates are 5% or less,
62% of the royalty rates are 6% or less,
66% of the royalty rates are 7% or less,
75% of the royalty rates are 8% or less ,
76% of the royalty rates are 9% or less, and
91% of the royalty rates are 10% or less.

The overall trend for royalty rates continues to be up. Large multinational corporations are looking at their intellectual property portfolios as key assets that deserve specialized management. They are establishing subsidiaries with the sole purpose of managing and licensing their technology. Others are using their technology as the basis for new businesses and strategic alliances. Many other companies are using their new technologies to establish industry standards. All of these forces are driving royalty rates to new levels.

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