Intellectual Property Valuation and Royalty Determination

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Tim specialises in the valuation and transfer pricing of intangible assets. He has extensive experience of:

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1. Introduction

The main objective of this chapter is to describe the factors that guide the determination of royalty rates for licensed intellectual property rights (IP). Key principles of IP valuation are also discussed as royalty rates and value are flip sides of the same coin; both are driven by the earnings capability of the asset.

The most obvious need for a royalty rate is the negotiation of a licence; however, royalties are required for a variety of other purposes, including:

- *Transfer pricing*: Within multinational corporations, the use of IP by entities operating in different tax jurisdictions results in a transfer of earnings. Tax authorities in developed markets are paying considerable attention to ensure that arm's length royalties are charged. Guidance is provided in OECD Transfer Pricing Guidelines and country specific tax rulings.
- *Litigation*: Damages claims resulting from IP infringements can be influenced by the level of royalties that are likely to have been agreed upon by the owner of the IP and the infringer.[1]
- *Strategic planning*: The management of IP portfolios benefits from the quantification of the current and potential strength and earnings of each asset. Royalty potential is an important metric in a review of an IP portfolio.
- *Valuation*: One of the income-based methods of IP valuation is based on the notional royalties that the property could generate.

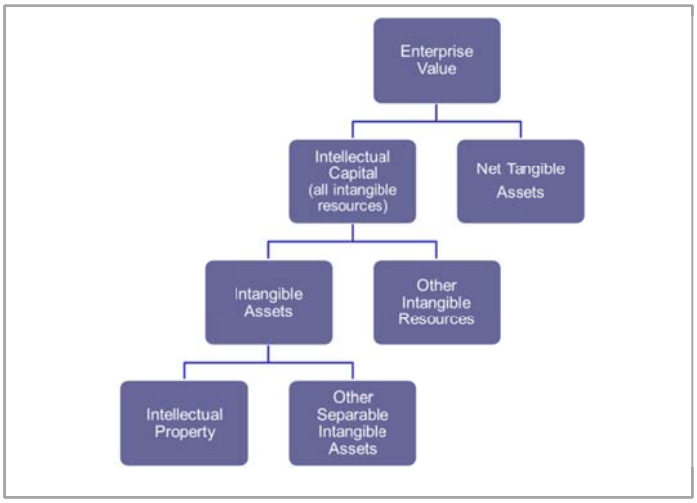
In turn, IP valuation can be required for financial reporting, tax compliance, pre-acquisition due diligence, and strategic asset management.

At the outset, it is helpful to compare different definitions of intangible items. Accountants use the term '*intangible assets*' to describe non-monetary assets without physical substance

[1] The legal issues associated with the calculation of damages in an infringement suit are beyond the scope of this Chapter, particularly since such issues often are dependent upon the law in the jurisdiction where suit was brought and thus, the jurisdiction calculating damages. For example, in the U.S., a reasonable royalty for purposes of a damages calculation often is determined in a "hypothetical" negotiation that evaluates various so-called *Georgia-Pacific* factors. *See Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D. N.Y. 1970). Moreover, in the U.S., damages in an infringement suit could include the patentee's lost profits and the U.S. Courts apply a four-factor test for determining the propriety of lost profits damages, including (1) demand for the patented product, (2) absence of acceptable non-infringing substitutes, (3) manufacturing and marketing capability to exploit the demand, and (4) the amount of profit the patentee would have made. *See Ericsson, Inc. v. Harris Corp.,* 352 F.3d 1369, 1377-79 (Fed. Cir. 2003); *Micro Chem., Inc. v. Lextron, Inc.*, 318 F.3d 1119, 1123 (Fed. Cir. 2003). *See also Panduit Corp. v. Stahlin Bros. Fibre Works,, Inc.*, 575 F.2d 1152 (6th Cir. 1978).

that are identifiable, controlled by the owner, and expected to generate economic benefits. Intellectual property rights are a subset of intangible assets. The term 'intellectual capital' is generally used in a broader context, referring to all non-monetary and non-physical resources that contribute to value creation. This will include items such as human capital which does not meet the accounting definition of an intangibles asset.

Diagram 1: Terms Used to Define the Resources within an Enterprise



The diagram shows that intellectual property rights are a subset of intangible assets, which in turn are a subset of an enterprise's total asset base.

2. The Economics of Intellectual Property

Technology, trademarks and other IP are typically combined with other assets in order to generate cash flows. The value of an enterprise is a function of the free cash flow that it is expected to generate and the associated risk. The resources of the business are the building blocks of enterprise value.

Knowledge of the value contribution of each of these building blocks, and the linkages between them, is essential for corporate strategy, IP management, and IP valuation. Competitive advantage is increasingly due to the development, integration and reconfiguration of intangible resources. Yet few companies have a clear appreciation of the current and potential value contribution of their IP and other intangible assets.

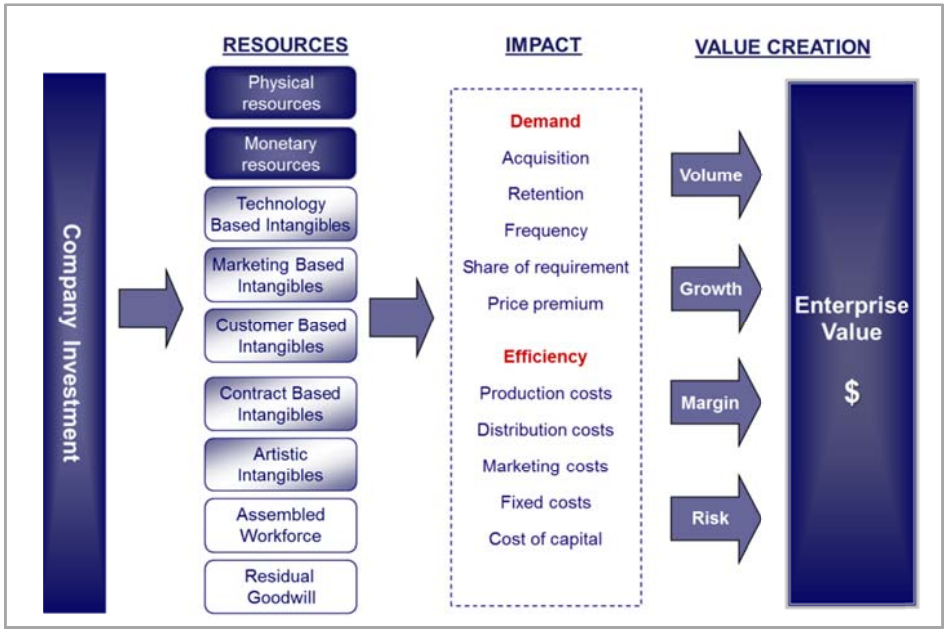
The economic characteristics of IP are significantly different to tangible assets:

- IP is not diminished by use, and can generally be used simultaneously by many parties.
- There is seldom a not a linear relationship between the cost of creating IP and its value. The risk of wasted investment is high, but this is countered by a high upside potential if the property IP is successfully commercialized.
- The value of IP often results from linkages with other assets.
- IP is commonly licensed on a standalone basis, but usually sold as part of a business combination. Market based royalty rates are often available, but comparable sales transactions cannot always be identified.
- Most companies have inadequate metrics regarding the strength, performance and value of their IP.

Value creation maps can be used to identify the relative importance of IP within a business, and the linkages with other resources. These maps illustrate how the resources of an organisation are deployed to create a differentiated market position and generate cash flows. The direction and extent of the resource inter-relationships, and their role as value drivers, can be estimated through a combination of market research, statistical analysis of historic data, and Delphi techniques.

Diagram 2 is best read from right to left. The concept that the value of a business is the net present value of future cash flows is not contentious. Nor is the premise that corporate strategy should be directly linked to driving future cash flows. The challenge is to link demand and efficiency drivers back to the contributing resources, tangible and intangible, and ultimately to investment decisions. This is best achieved by identifying the sequential stages in the value chain.

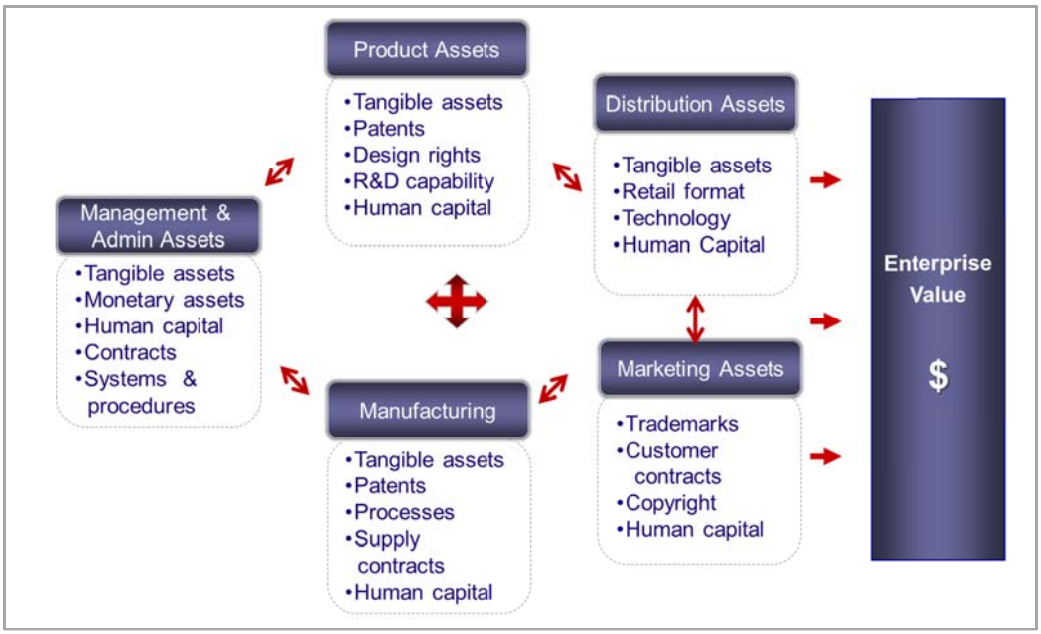
Diagram 2: Value Map - Identifying IP and Other Resources



Source: Brand Finance plc

The diagram is generic and has been simplified into a linear framework. The importance of each resource will differ according to the sector in which a company operates, its core competencies and its means of differentiation. In the real world business models are not linear; linkages between resources can be crucial to value creation. The following diagram shows that grouping the organisation's resources by function can help identify their relative importance and linkages.

Diagram 3: Value Map - Grouping IP by Function and Gauging Importance



Source: Brand Finance plc

When evaluating the earnings generated by IP in its current use, it is necessary to disaggregate the earnings of the enterprise. For the purpose of determining the earnings of the IP to another owner, it is necessary to estimate the incremental earnings that the property will generate.

3. Royalty Rate Determination

Royalty payments are a profit sharing mechanism. Parties to a license are free to select whatever basis of royalty calculation that meets their commercial requirements. The most common method is the expression of the royalty as a percentage of revenue, other methods include:

- A single up-front payment.
- A pre-determined amount that is paid periodically, similar to a property rental.
- A charge based on units of manufacture or sales.
- For early stage technology, royalties can be based on development costs.

Whatever basis is used, consideration should be given to the detail. For instance, a royalty based on sales revenue can be calculated on either retail or wholesale revenue, and can be calculated pre or post returns and discounts.[2]

When considering alternative royalty bases and rates, it is recommended that the expected cash flows are modelled over the duration of the license for a number of potential scenarios. For instance, a large up-front payment accompanied by a low revenue-based royalty might appear attractive to the licensor in the short term, but prove to be sub optimal over the duration of the license. For instance, a multinational company licensed the trade marks for a key brand in a major market for a sub-optimal royalty and upfront 'sweetener'. Surprisingly, the license was in perpetuity. Although the upfront payment benefited short term cash flow, it was dwarfed by the diminished ongoing royalty. As there was no escape from the license, the trademarks were ultimately sold to the licensee.

There are two fundamental factors that influence a royalty rate. The first is the earnings generated by the intellectual property, and the second is how this is shared between the owner and the licensee. Royalty determination is often complicated by uncertainty regarding the extent of the economic contribution of the IP. This is accentuated by the fact that IP is typically bundled with complimentary assets in order to generate earnings. Dissecting the earnings of a business between the contributing assets is a complicated and often imprecise task.

An alternative approach is to base the royalty on rates achieved in arm's length licenses of similar IP. At a superficial level, this transactional approach seems simple, providing that information from comparable agreements is available. However, the distinctive characteristics of intellectual property rights and the nuances of license agreements can complicate matters.

The income and transactional approaches to royalty determination are discussed in more detail in the following section.

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[2] As previously stated, legal issues associated with the calculations of damages for infringement are beyond the scope of the Chapter. However, it should be noted that in the U.S., recent decisions from the U.S. Court of Appeals for the Federal Circuit have addressed issues pertaining to the use of the "entire market value" when calculating damages. *See Lucent v. Gateway*, 580 F.3d 1301 (Fed. Cir. 2009). Moreover, before an expert can present the entire market value theory to a jury, the expert must a demonstrate "that the patented invention was the basis for demand of those products." *Cornell Univ. v. Hewlett-Packard Co.*, No. 01-CV-1974, 2008 WL 2222189, *2 (N.D.N.Y. May 27, 2008) (internal citations omitted)).

When IP is licensed between unrelated parties the royalty is the subject of negotiations; however, for litigation and transfer pricing the royalty is purely based on analysis. Licensing practitioners might feel that economic analysis is superfluous as royalty rates are dependent upon their negotiating ability and the intrinsic strength of the IP. However, negotiation is clearly assisted by having a robust analytical basis to support a position.

Income Approach to Royalty Setting

It is straightforward to identify the earnings of an existing asset that is used on a standalone basis, so all that is required to determine a royalty is a basis for splitting the earnings between the owner and licensee. Payment of all of the earnings as a royalty would negate the purpose of the license for the licensee (unless there are synergistic benefits). At the other extreme, allowing the licensee to retain all of the earnings is unlikely to appeal to the owner. The appropriate point within the earnings spectrum is a function of market forces that include:

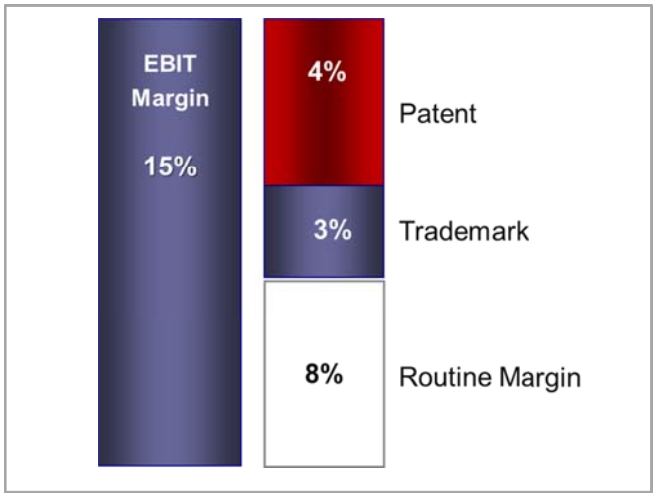
- The uniqueness of the IP;
- The number of suitable licensees;
- The risks born by the two parties and their respective levels of investment;
- Each party's rights and responsibilities in terms of the license.

Most IP has to be integrated with other assets in order to generate income. This makes it more difficult to identify the earnings that it generates. Unravelling the earnings of the subject IP from other assets can be achieved by applying the Profit Split or Residual Profit methods.

Both of these methods analyse the profit margin of the business in which the IP is used, in order to apportion it to the underlying assets. The starting point of the analysis can be earnings before interest and tax (EBIT), or EBITDA which also excludes depreciation and amortisation. The nature of the industry and availability of data will influence the selection of the profit level indicator.

Diagram 4 illustrates that the next step is to make a charge for tangible assets and routine intangibles in order to determine the 'excess earnings' or margin attributable to the unique intangibles within the business. The routine margin earned in the subject industry can be determined by an analysis of the profitability of comparable companies which do not own valuable IP.

Diagram 4: Example of Profit Split Analysis



In the illustrated example, the EBIT margin of the business that owns the subject IP is 15%, and the routine margin has been estimated as 8%. Let's assume that the purpose of the exercise is to determine a royalty rate for a patent, and that the profitability of the business unit also benefits from a well-established trademark. Further analysis is therefore required to split the excess earnings of 7% between these two assets. If the arm's length royalty rate for the trademark is known, then the margin attributable to the patent is established on a residual basis. In the illustration, the residual margin attributed to the patent is 4%.

If the trademark royalty is not known, it is necessary to split the excess margin of 7% between the patent and the trademark according to an evaluation of their relative economic contribution. This requires an analysis of the extent to which each asset differentiates the firm's product from its competitors, or the extent to which it generates production efficiencies.

A profit split analysis can be based on quantitative research or qualitative weightings of value drivers. The latter approach provides directional guidance rather than a specific answer. In the example, the finding that the patent contributes between 50% and 60% of the excess margin would infer a royalty of between 3.5% and 4.2% of revenue. (As the operating margin is expressed as a percentage of revenue, so too is the portion of the margin that is attributed to the patent.)

The reasonableness of the findings should be cross checked against expected royalty rates for comparable IP in the industry.

Transactional Approach to Royalty Setting

The transactional approach determines royalties with reference to licenses for comparable IP in comparable markets and circumstances. This approach is widely used for transfer pricing where it is referred to as the Comparable Uncontrolled Price Method (CUP).

The best comparable royalties are from arm's length licenses for the same IP in the same, or similar, markets.[3] If this is not possible, analysis of specific licenses for comparable IP, or industry norms, can provide guidance.[4]

When analysing arm's length royalty rates for comparable IP, it is necessary to take account of the following factors.

- The similarities and differences between the subject IP and the benchmarked transactions. This covers the nature and application of the IP; its phase of development and commercial success; its strength relative to alternative property, and its expected useful economic life.
- The range of markets covered by the license.
- The comparability of the markets in which the IP was licensed. The earnings potential of a similar asset can vary significantly between jurisdictions due to different economic circumstances and competitive forces.
- The method of calculating the royalty.[5] A headline royalty in a benchmark study might conceal adjustments to the royalty base that differ to the licence of the subject IP.
- The impact of the terms and conditions of the comparable licenses. For instance, an exclusive license will typically have a higher royalty than a non-exclusive one, the duration of the license can influence the royalty as can other terms of the agreement which influence the rights and responsibilities of the licensee.

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[3] *See Rude v. Wescott*, 180 U.S. 152 (1889) (referring to an established royalty rate based on the prior licensor practices). *See also Tektronix, Inc. v. United States*, 552 F.2d 343 (Ct. Cl. 1977) (preferring an established royalty rate when a pattern of prior licensing practices is evident.); and *T.J. Smith & Nephew Ltd. V. Parke, Davis & Co.*, 9 F.3d 979 (Fed. Cir. 1993) (stating that evidence of an established royalty for a patent in suit is one of the strongest measures of a reasonable royalty); *Trell v. Marlee Elecs. Corp.*,912 F.2d 1443 (Fed. Cir. 1990)(discussing the standards for determining when an established royalty exists).

[4] In the U.S., the Courts have recently emphasized and reiterated that the IP in other license agreements must be "comparable" in order to rely on such agreements in a damages analysis. *See ResQnet.com v. Lansa*, 594 F.3d 860 (Fed. Cir. 2010).

[5] U.S. Courts recently have criticized analyses that are "little more than a recitation of royalty numbers" requiring instead evidence as to how lump sum payments in other, comparable license agreements for example, were calculated. *See WordTech v. Integrated Network*, 609 F.3d 1308 (Fed. Cir. 2010).

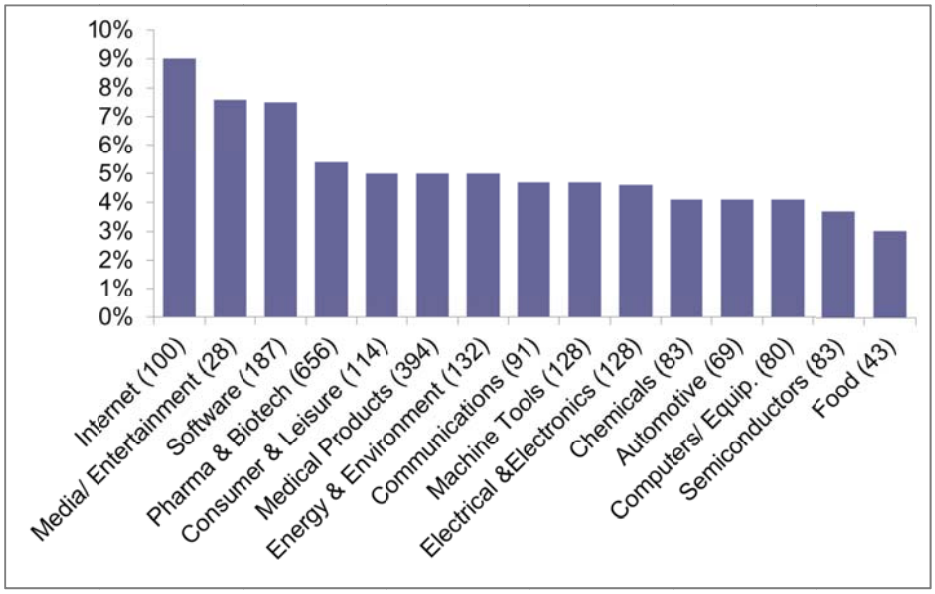
- Special circumstances that may have influenced the benchmarked royalties. For instance, if sales of the product incorporating the IP increase sales of other products, the licensee might agree to a low royalty.

The extent of publicly available royalty rates varies by industry and category of IP, depending on the prevalence of licensing and need for disclosure. In situations where there are a large number of licensing agreements, an analysis can be made of the range of royalties within the industry. The following paragraphs explore the extent to which reliance can be placed on industry norms.

A study of 2,279 licenses in fifteen industries[6] suggests that the median royalty in most industries is close to 5%.

[6] Carried out by Analysis Group, using data from RoyaltySource®, as quoted by Russell Parr, 'Royalty Rates for Licensing IP'

Diagram 5: Median Technology Royalty Rates



Source: Analysis Group, as quoted by Parr, R. in 'Royalty Rates for Licensing IP'

The grouping around 5% of average royalties in a wide range of industries is interesting, but not very informative. Median and average royalty rates have to be treated with caution as they can mask wide ranges within an industry.

A 2008 study by Porter, Mills and Weinstein[7] concluded that in the three industries reviewed, royalty rates are concentrated around a certain royalty range and are not widely dispersed. Within these industries, the range of royalty rates is sufficiently narrow for meaningful conclusions regarding the average.

Diagram 6: Royalty Rate Ranges in Three Industries

			95% Confidence Interval	
Industry	Number	Average Royalty	Lower Bound	Upper Bound
Medical Device	77	4.35%	3.71%	5.00%
Pharmaceutical	90	5.66%	4.75%	6.57%
Chemical	21	3.70%	2.82%	4.57%

Source: les Nouvelles, March 2008.

It is always necessary to consider the confidence level of the royalty range and whether the strength of the subject IP could result in it deviating significantly from the average. The

[7] Porter, M; Mills, R; Weinstein, R, 'Industry Norms and Reasonable Royalty Rate Determination', les Nouvelles, March 2008.

following example, in a different industry, illustrates how blinkered use of interquartile ranges can lead the analyst astray.

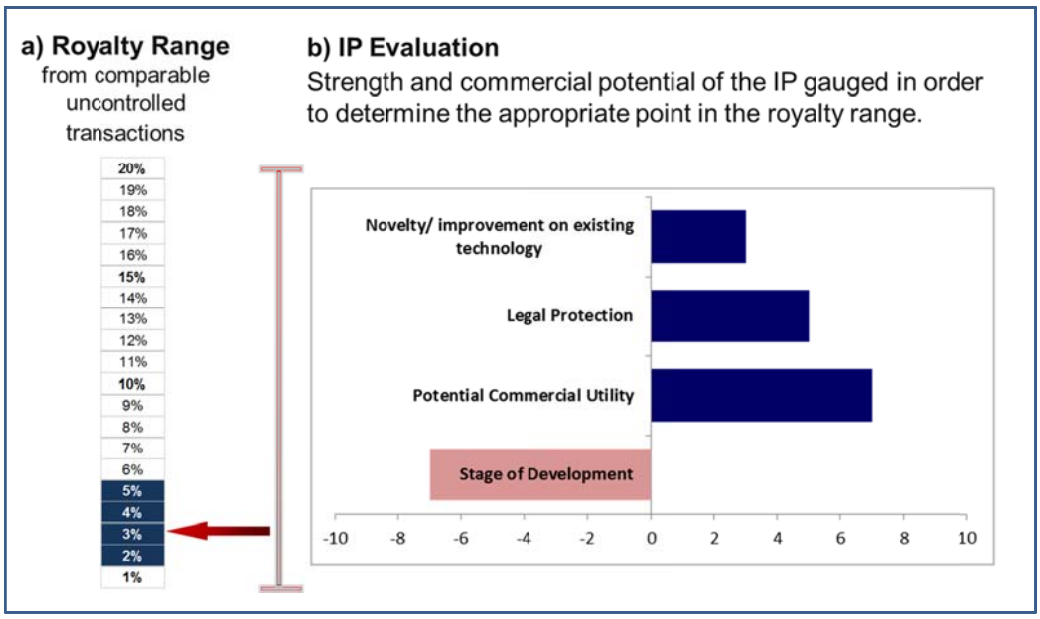
Diagram 7: Royalty Range for a Sample of Renewable Energy Patents

Maximum:	19.5%
Upper Quartile:	5.0%
Average:	4.0%
Median:	3.0%
Lower Quartile:	2.0%
Minimum:	1.0%
Sample Size:	*35*

Source: Brand Finance PLC

The inter-quartile range of 2% to 5% suggests a fairly narrow royalty band, but this disguises the existence of royalties up to 19.5%. A would-be licensor of renewable energy technology would do well to evaluate the strength of the IP prior to accepting a median royalty of 3%. A simple analysis of four factors that influence the economic potential of a hypothetical renewable energy patent is illustrates below. The findings can be used to determine an appropriate point within the sector range for the subject IP. In the illustrated case, the subject IP has high commercial potential, but is downgraded because it is at an early stage of development. This results in a royalty rate close to the sector median.

Diagram 8: Using an IP Evaluation to Determine an Appropriate Point in the Industry Royalty Range



Source: Brand Finance PLC

Return on R&D Costs

There is often a non-linear relationship between the cost of creating intangible assets and their market value; the gap between cost and value is particularly pronounced for unique IP. As a result, R&D costs cannot be relied upon as a reliable basis for royalty determination. However, there are circumstances where R&D costs provide a relevant reference point for royalty determination.

- In the case of replicable technology, R&D costs are relevant because potential licensees can choose between developing an asset of similar utility or licensing existing technology.
- When the income potential for early stage technology is difficult to gauge, R&D costs can be used to provide a gauge to royalty potential. The royalty should also account for the novelty of the technology and the strength of legal protection.

Return on Market Value

Where the market value of IP has been determined, this provides a relevant basis for calculating an appropriate return earned through a royalty. Market value accounts for factors such as the unique characteristics of the asset, ease of replication, and income potential. The return earned by the owner through a royalty will therefore be largely influenced by the useful economic life of the asset, any unique contribution made by the licensee, and the terms of the license agreement.

25% Rule

According to this rule of thumb a licensee should pay a royalty rate equivalent to about 25 per cent of the expected profits for the product that incorporates the subject IP. The rule has been widely used as a starting point in royalty rate determination for several decades, despite, or because of, its simplicity and the intuitive logic that royalties are aligned with profitability. Criticism of the rule focuses on the lack of clarity regarding the appropriate profit level indicator, the contribution of other IP within the operating business, and disputes regarding the empirical evidence.[8]

[8] In the U.S., the Courts recently rejected the use of the 25% rule in calculating a royalty for damages purposes calling the 25% Rule "fundamentally flawed." *Uniloc v. Microsoft*, 632 F.3d 1292 (Fed. Cir. 2011).

Goldshneider, et al. (2002) conclude that the "the Rule is a valuable tool (rough as it is), particularly when more complete data on incremental IP benefits are unavailable. The Rule continues to have a fair degree of both 'positive' and 'normative' strength".

A more recent study conducted by Kemmere and Lu[9] found that average royalty rates "rendered indirect support to the 25% rule. However, such a conclusion should be taken with caution, because no linear relationship was found between the reported royalty rates and operating margins."

A more important finding of this study is that statistical analysis shows a linear relationship between reported royalty rates and profitability measures, and that this suggests that the licensing market is efficient and that "cost structure and profitability across industries have been factored into royalty rate negotiations".

A detailed review of the 25% Rule is beyond the scope of this chapter; the most pertinent point is that it should not be relied upon in isolation, although it can provide a starting point for an analysis where there is a scarcity of supporting information.

Royalty Cross Checks

Whatever the primary method of valuation, it is strongly recommended that the output is sense checked by other methods. A process of triangulation can provide strong support for a royalty range in situations where no single method is compelling.

In the illustrated example four methods have been applied to support a royalty range.

Diagram 9: Use of Multiple Methods to Determine a Royalty Range

i) Comparable royalties between unrelated parties:	
- upper quartile	8.0%
- median	5.5%
- lower quartile	2.0%
ii) Excess earnings analysis	5.0%
iii) 25% rule of thumb	4.5%
Recommended royalty range (considering IP evaluation)	5.0% - 5.5%
iv) Implied royalty cover	4.5

[9] Kemmerer, J.E and Lu, J, 'Profitability and Royalty Rates Across Industries: Some Preliminary Evidence', Journal of Academy of Business and Economics, volume 8, number 3, 2008.

In some instances, different methods will suggest significantly different royalties. This is a strong signal to review the supporting evidence and assumptions.

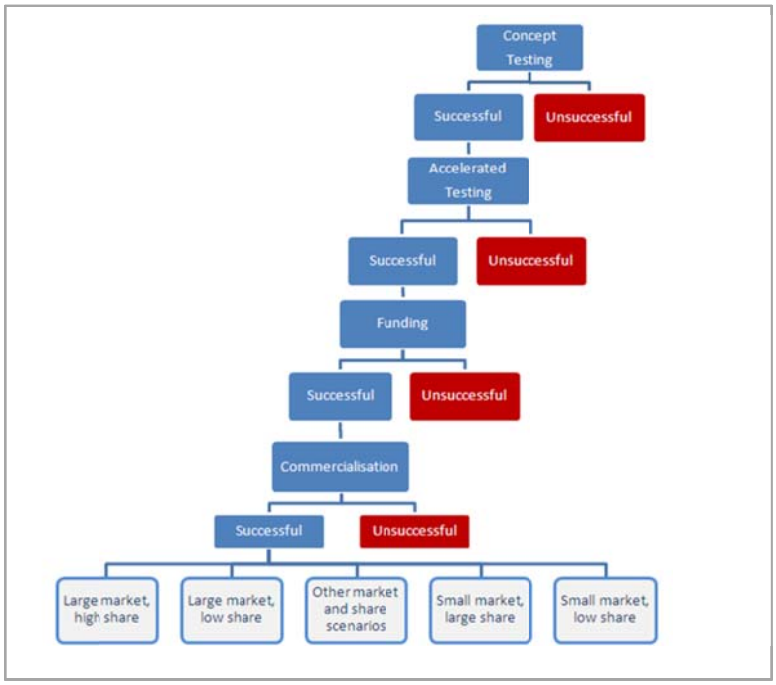
4. Special Circumstances

Early Stage Technology

For technology that is in its infancy and will not be commercialised for several years, there is great uncertainty regarding the extent and timing of future earnings. In some instances the technology will have to be integrated with other resources in order to generate earnings, and at an early stage it is difficult to evaluate its relative importance within an income generating unit.

In these situations a probability weighted valuation can be appropriate. The illustrated probability tree indicates that there are a number of hurdles to be negotiated before the technology generates earnings. The cumulative effect of the probability of failure at each hurdle supresses the current value of this technology.

Diagram 10: Probability Tree Identifying the Hurdles and Risks Prior to Commercialisation



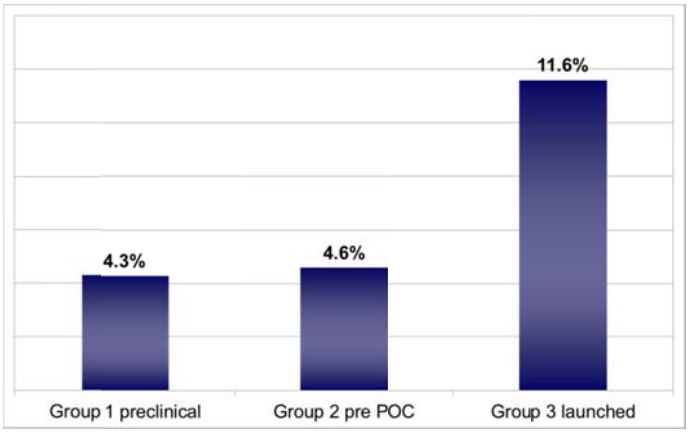
Source: Brand Finance PLC

Even if the estimation of probabilities and future earnings make the income approach impractical, a probability tree helps make appropriate assumptions for a transactional or cost based royalty calculation.

Clinical Trials

A similar relationship between stage of development and royalty rates occurs in the pharmaceutical sector. A 2009 study by Renwick and McCarthy[10] analysed the royalties charged in 155 biopharmaceutical licenses, and split these by stage of development, namely preclinical, pre POC (proof of concept), and launched.

Diagram 1: Average Fixed Royalty by Stage of Development



The diagram illustrates average royalties. In comparison, the median royalty of 3.5% for the preclinical group showed a greater difference with the pre-POC group's median of 5.0%. The maximum royalty found for launched IP was 27.5%.

The authors of this study note a clear trend to the use of tiered royalties as predicted sales increased, and conclude that "this finding supports the use of tiered royalties for larger value deals where there is greater potential for disparity between the sales predicted by the licensor and licensee."

5. Valuation Approaches and Methods

An IP valuation should consist of the following steps:

(i) Confirmation of the purpose and scope of the valuation.

(ii) Definition of the subject asset.

(iii) Identification of the premise, or basis, of value.

(iv) Selection of the appropriate valuation approach.

[10] Source: Les Nouvelles: Review of LES BioPharma Royalty Rate and Deal Terms Survey

(v) Selection of the method of valuation.

(vi) Determination of the valuation assumptions.

(vii) Cross checks of the findings.

Purpose and Scope

The level of detail and rigour required in a valuation ranges between an indicative valuation and a formal valuation opinion. It is important to match deliverables with the purpose of the valuation. It is inappropriate to commission an indicative valuation for the purpose of litigation, financial reporting or transfer pricing, but in other instances management only needs to know the order of magnitude of an asset's value in order to make a commercial decision.

Valuation reports must always indicate whether there is a limitation of scope.

Asset Definitions

A clear definition of the subject asset is especially important for intangible assets as terms such as 'technology' and 'brand' are subject to different interpretations. It is necessary to identify the specific rights that are bundled into a generic heading. The extent of rights within the package can have a significant impact on its earnings potential and value.

The term 'technology' can include patents, patent applications, design rights, trade secrets, software and documented know-how. Similarly, there is no generally accepted definition of the term 'brand'. This is sometimes used in reference to trademarks and associated goodwill, while on other occasions it includes recipes, formulae, design rights and copyright. It extreme cases the term is used to describe a branded business unit, consisting of both tangible and intangible assets.

When interactions between intellectual property rights are intense, they are treated as complimentary assets – both for transactional and valuation purposes.

Premise or Basis of Valuation

Value is in the eye of the beholder, so it is essential to determine whether an asset is to be valued from the perspective of the current owner (value in use), a typical purchaser (market value), a specific purchaser (investment value), or an unwilling seller (liquidation value).

The purpose of the valuation will usually determine the appropriate premise of value. In most commercial situations, market value is the appropriate premise. International Valuation Standards define market value as:

"The estimated amount which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently, and without compulsion."[11]

Valuation Approaches

There are three valuation approaches, namely the cost approach, sales comparison (or market) approach, and the income approach.

Cost approach - This approach values the IP on the basis of its historic cost of creation, or the estimated cost to create a replacement asset with similar commercial utility. Consideration is given to all costs (expressed in current values) associated with replacing or replicating the IP, less an allowance for any forms of obsolescence that has occurred.

The cost approach is only appropriate for valuing easily replicable assets. The non-linear relationship between the development cost of certain IP and its value must be born in mind. This is reflected in a situation where millions of dollars in R&D are incurred on unsuccessful technology that has negligible value.

Sales comparison approach - This approach establishes value by comparison to recent sales of comparable assets. Information regarding the standalone sales of patents and trademarks are sometimes available; however, IP is more frequently sold as part of a business combination. The unique nature of IP means that even if sales prices for comparable IP are available, adjustments are required for differences in the utility of the asset and for factors such as the relative market conditions at the time of the sale and the remaining economic life.

Income Approach - Finance theory holds that the amount that a rational investor will pay for a business or asset is the cash flow that it is expected to generate, discounted by the cost of capital (which takes account of the asset's risk profile).

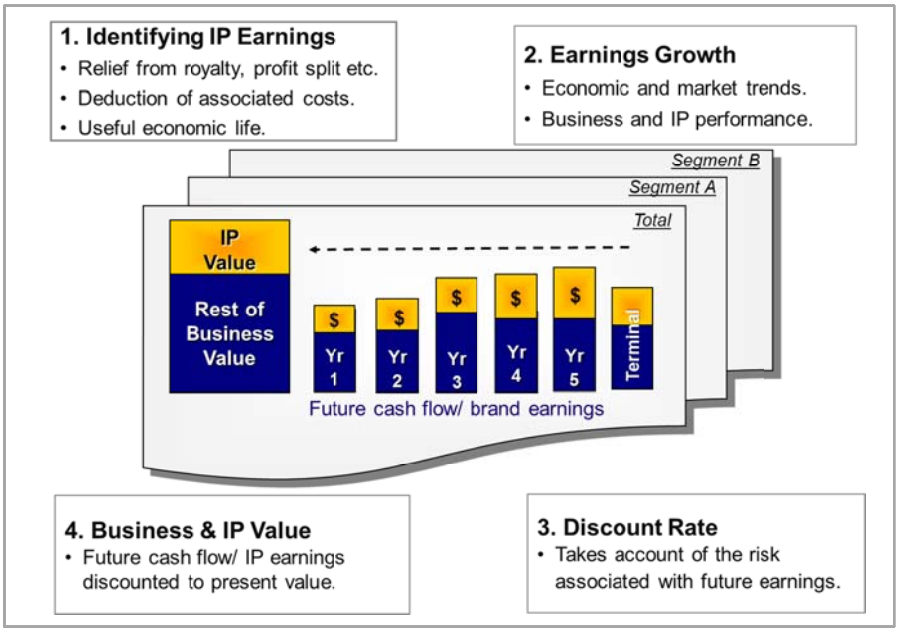
The income approach is generally the most appropriate approach for valuing patents and trademarks. As illustrated in Diagram 12, it involves:

- Identifying the current income generated by the IP. For property that is integrated into a business unit, this will involve determining the portion of the earnings that are attributed to the IP. (The next section describes some of the available methods.)
- Deducting associated costs.

[11] International Valuation Standards, Seventh Edition, 5.2 page 27.

- Determining the useful economic life of the IP. This concept differs from the legal duration of a patent. The useful economic life of technology will be a finite period that differs by industry and takes account of the likelihood of technology obsolescence. On the other hand, brands are generally assumed to have an indefinite life unless there are signs of impairment.
- Forecasting the rate of earnings growth. Growth rates take account of expected economic conditions, industry trends, competitive performance, and asset specific factors.
- Calculating a discount rate. The discount rate is used to determine the current value of each dollar earned in future years. It is a function of three factors: the risk free rate (yield on government bonds), the market risk premium (extra risk applying to the share market), and specific risks attached to the company and IP.
- Discounting the forecast IP earnings back to a present value.

Diagram 12: Illustration of a Discounted Cash Flow Valuation



Source: Brand Finance plc

Earnings multiples can be used as a proxy for future cash flow and risk, however, the discounted cash flow method is theoretically more robust as it requires key value drivers to be discretely analysed.

The income approach is reliant on the ability to make reasonable estimates of future earnings; this can complicate its use for the valuation of early stage technology which will not be commercialised for some years. This is discussed later in the chapter.

There are a number of income based valuation methods.

Income Based Valuation Methods

The income based valuation methods are closely linked to the methods of royalty determination, which have already been discussed.

Relief from Royalty: This is a commercially orientated method that is based on the assumption that if the subject IP was not owned, it would have to be licensed from a third party, and a royalty paid. The value of the IP is represented by the present value of the notional royalty stream that ownership relieves the business from paying. The capital value of the asset is calculated using either a discounted cash flow or multiple to arrive at the current value of the forecast notional royalty stream. Determination of the notional royalty rate will use one of the methods discussed in section 3 of this chapter.

Profit Split: This is similar to the profit split method of royalty determination. Rather than expressing the subject IP's profit contribution as a percentage of sales, the dollar amount is forecast into the future and discounted back to a present value. The profit contribution of the subject IP can be determined through quantitative research or qualitative weightings of value drivers.

Residual Earnings: This method values the IP as the present value of the future residual cash flow after deducting returns for all other assets required to operate the business. The first step is to make a charge to operating profit for net tangible assets and routine intangibles. Thereafter, charges are made for identifiable intangible assets that have already been valued. As long as it has been established that the subject IP is the only remaining asset, the residual earnings are attributed to it. The rate used to calculate the charge made for each asset category takes account of the company's cost of capital and the asset's risk profile.

Incremental cash flow method: The incremental cash flow method identifies the cash flow generated by the subject IP through comparison with a business that is comparable in all other respects, but does not have similar IP. The evaluation of incremental cash flows considers increased revenues and reduced costs. Although conceptually sound, this method is difficult to apply in practice.

Valuation Assumptions

The rigour of an IP valuation is heavily dependent on the quality of the assumptions. A formal valuation report will include a significant amount of analysis to support each assumption, and clearly state all data sources. Less rigour is required for an indicative valuation.

As illustrated in Diagram 12, the key assumptions of a discounted cash flow valuation are the current earnings of the subject IP, forecast growth, discount rate, and the useful economic life of the asset.

When the sales comparison approach is used, it is necessary to evaluate the extent of the similarities and differences of the comparable transactions as compared to the subject IP. The reasons for any adjustments should be articulated and the supporting analysis disclosed together with the data sources.

Key assumptions in cost based valuations include any decisions as to whether components of historic R&D are relevant to the replacement of the asset, inflationary adjustments, and obsolescence provisions.

Valuation Sense Checks

As with royalty determination, IP valuations benefit from the use of more than one method and from commercial sense checks. For instance, if the income approach has been used, the implied earnings multiple should be considered for reasonableness. The cost of replicating the IP, or producing an asset of similar utility, should always be considered as it represents the ceiling to the valuation.

It is advisable to carry out sensitivity analysis to determine the value impact of changes in key valuation assumptions, and to disclose the impact of these in the report.

Contents of a Valuation Report

A formal valuation report should contain the following information:

- The scope of the valuation and any limitations or restrictions to its scope.
- The purpose for which the valuation report has been prepared.
- A clear description of the asset being valued.
- The date at which the value has been determined, and the date on which the report has been issued.

- The basis, approach and method of valuation.
- A conclusion of value.
- Sufficient details of the valuation and underlying assumptions to allow a reader to understand how the conclusion was reached.
- The name, qualifications and experience of the valuer.

6. Conclusion

Decisions regarding the value of IP, and associated royalty rates, have far reaching commercial consequences. This justifies thorough analysis of potential IP earnings prior to a transaction, and careful consideration of the value impact of the terms of the agreement.

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