Valuation of Intellectual Property in the Marital Estate: Part II of II

ROBERT F. REILLY, CPA

The first part of this article introduced the types of intellectual property that may be included in the marital estate and explained the various reasons to value that intellectual property. That portion of this discussion also described the analyst's due diligence procedures as part of the valuation analysis. Part II of this article further explains and illustrates the generally accepted intellectual property valuation approaches and methods.

The analyst typically attempts to use all three property valuation approaches to value marital estate intellectual property: the cost approach, the market approach, and the income approach. When possible, the analyst can develop mutually supportive evidence and a multi-faceted perspective regarding the intellectual property value. However, due to data constraints, it is common for an analyst to rely on only one or two valuation approaches in the intellectual property valuation process.

The following discussion describes—and illustrates—the cost approach, market approach, and income approach valuation methods. And, it summarizes the process of reconciling multiple value indications into a final value conclusion.

COST APPROACH VALUATION METHODS

There are several intellectual property valuation methods within the cost approach. Each valuation method uses a specific definition of cost. Two common cost definitions are:

(1) reproduction cost new and

(2) replacement cost new.

Reproduction cost new is the total cost, at current prices, to develop an exact duplicate of the subject intellectual property or the total cost, at current prices, to develop an asset having the same functionality or utility as the actual intellectual property. Functionality is an engineering concept that means the ability of the intellectual property to perform the task for which it was originally designed. Utility is an economics concept that means the ability of the intellectual property to provide an equivalent amount of satisfaction.

There are also other cost definitions that may be applicable to a cost approach valuation. Some analysts consider *cost avoidance* as a cost approach measure. This cost measure quantifies either historical or prospective costs that are avoided because the marital estate actually owns the intellectual property.

Other analysts consider *trended historical costs* as a cost approach measure. In this cost measure, historical intellectual property development costs are identified and trended to the valuation date by an inflation-based index factor. Regardless of the specific cost measure used, all cost approach methods include a comprehensive definition of cost.

Cost Measurement

The cost measurement (whether replacement cost new, reproduction cost new, or some

Robert F. Reilly, *CPA, is a managing director of Willamette Management Associates, a business valuation, forensic analysis, and financial advisory services firm. He is resident in the firm's Chicago office and is a certified public accountant accredited in business valuation, certified in financial forensics, a certified management accountant, a chartered financial analyst, and a certified business appraiser.*

other cost measure) typically includes four cost components:

(1) direct costs (*e.g.*, materials),

(2) indirect costs (*e.g.*, engineering and design labor),

(3) the intellectual property developer's profit (on the direct cost and indirect cost investment), and

(4) an opportunity cost/entrepreneurial incentive (to motivate the development process).

Typically, the intellectual property development material, labor, and overhead costs are easy to identify and quantify. The developer's profit can be estimated using several procedures. It is often estimated as a percentage rate of return on the total investment in the material, labor, and overhead costs. The entrepreneurial incentive is often measured as the lost profits during the replacement intellectual property development period. For example, let's assume it will take two years to develop a replacement patent. If the buyer buys the seller's actual patent, then the buyer can start earning income (either operating income or license income) immediately. If the buyer "builds" its own hypothetical replacement patent, then the buyer will not earn any income (operating income or license income) during the two-year development period. The two years of lost profits during the hypothetical patent development period represents the opportunity cost of developing a new replacement patent—compared to buying the actual seasoned patent.

Due to data constraints, analysts commonly rely on one or two valuation approaches.

All four cost components—that is, direct costs, indirect costs, developer's profit, and opportunity cost—should be considered in the intellectual property cost approach valuation. Although the cost approach is different from the income approach, there are economic analyses included in the cost approach. These economic analyses provide indications of both:

(1) the appropriate levels of opportunity cost (if any), and

(2) the appropriate amount of economic obsolescence (if any).

The intellectual property cost new (however measured) should be adjusted for losses in value due to:

- physical deterioration,
- functional obsolescence, and
- economic obsolescence.

Physical deterioration is the reduction in value due to physical wear and tear. It is unlikely that an intellectual property will experience physical deterioration.

Functional obsolescence is the reduction in value due to the intellectual property's inability to perform the function (or yield the periodic utility) for which it was originally designed. The technological component of functional obsolescence is a decrease in value due to improvements in technology that make the intellectual property less than the ideal replacement for itself.

Economic obsolescence is a reduction in value due to the effects, events, or conditions that are external to—and not controlled by—the intellectual property's current use or condition. The impact of economic obsolescence is typically beyond the control of the owner/operator.

In any cost approach analysis, the analyst estimates the amounts (if any) of intellectual property physical deterioration, functional obsolescence, and economic obsolescence. In this estimation, the analyst will consider the intellectual property's actual age—and its expected remaining useful life (RUL).

A common cost approach formula for quantifying intellectual property replacement cost new is:

reproduction cost new curable functional obsolescence = replacement cost new

To estimate the intellectual property value, the following cost approach formula is commonly used:

replacement cost new – physical deterioration – economic obsolescence – incurable functional obsolescence = intellectual property value.

Cost Approach Illustrative Example

Table 1 and Table 2 present an illustrative example of a cost approach intellectual property

Table 1
Brown Family Company
Computer Software Copyrights and Trade Secrets
Cost Approach—Replacement Cost New Less Depreciation (RCNLD) Method
Valuation Summary
As of January 1, 2015

Software System	Estimated Software Replacement Development Effort in Person Months [a]	Time to Develop Replacement Software (in Calendar Months)[b]	Indicated RCNLD Component [c] $000
AS/400	4,531	29	66,100
Point of Sale	575	25	8,400
Tandem	3,304	16	48,200
Unisys	1,229	5	17,900
Pioneer	1,807	41	26,400
Voyager	325	12	4,700
Host to Host	85	9	1,200
Total Direct and Indirect Costs	11,856	24	172,900
Plus: Developer's Profit [d]			10,500
Plus: Entrepreneurial Incentive [e]			31,200
Total Replacement Cost New			214,600
Less: Depreciation and Obsolescence [f]			13,300
Replacement Cost New Less Depreciation			201,300
Indicated Fair Market Value of the Brown Copyrights and Trade Secrets (rounded)			200,000

Footnotes:

[a] The estimated development effort for each Brown software category is equal to the average of the replacement development effort indication using (1) the constructive cost model (COCOMO) software cost engineering model and (2) the KnowledgePLAN software cost engineering model, rounded.

[b] The estimated time to develop replacement software in calendar months for each software category is equal to the average of the time to develop the replacement software in calendar months using (1) the COCOMO software engineering model and (2) the KnowledgePLAN software engineering model, rounded. The final figure in this column represents a weighted average time to develop the replacement software in calendar months (weighted by effort in person months), which is used to calculate the entrepreneurial incentive.

[c] Equal to the estimated development effort in person months multiplied by the $14,585 cost per person month, rounded. The $14,585 cost per person month was calculated by multiplying the blended hourly rate of $82.87 provided by the Brown vice president of data processing by 176 (8 hours per day times 22 days per month).

[d] Calculated as (1) total direct replacement cost new multiplied by (2) a computer software developer's profit margin of 11 percent times 55 percent. This adjustment is made because 45 percent of the software development workforce represents outside contractors, the cost of which already includes a market-based developer's profit.

[e] Calculated as (1) the Brown present value discount rate of 17 percent times (2) the sum of the total direct and indirect replacement cost new and the developer's profit, divided by 2, multiplied by (3) the weighted average total development time of two years (based on the weighted average time to develop in person months of 24 months as described in footnote [b]).

[f] According to Brown data processing management, the point-of-sale system is scheduled to be replaced and upgraded in approximately five years. The Pioneer system is also scheduled to be replaced and upgraded in approximately five years. And, the Voyager system is scheduled to be substantially upgraded next year. Therefore, the analyst estimated functional obsolescence as follows:

System Scheduled for Replacement	Replacement Cost New*	Percent Obsolete	Obsolescence Allowance
Point-of-Sale	$10,400,000	20%	$2,100,000
Pioneer	$32,700,000	20%	$6,500,000
Voyager	$5,800,000	80%	$4,700,000
Total			$13,300,000

*includes the developer's profit and entrepreneurial incentive cost components.

Table 2
Brown Family Company
Computer Software Copyrights and Trade Secrets
Cost Approach—Replacement Cost New Less Depreciation (RCNLD) Method
Estimate of Computer Software Developer's Profit

Profit Margin Comparison			Operating Profit Margins			
Selected Industry Sectors			**4/1/13–3/31/14**	**4/1/12–3/31/13**	**4/1/11–3/31/12**	
SIC Code 7371 — Custom Computer Programming Services — All Companies		[a]	4.2%	4.2%	4.8%	
SIC Code 7371 — Custom Computer Programming Services — Sales of $25 Million and Over		[a]	7.4%	3.8%	2.2%	
SIC Code 7373 — Computer Systems Design Services — All Companies		[b]	4.3%	3.1%	2.1%	
SIC Code 7373 — Computer Systems Design Services — Sales of $25 Million and Over		[b]	4.7%	4.3%	1.1%	
			Adjusted Operating Profit Margins			
Selected Guideline Public Companies	**Ticker**	**for 2014/2013**	**for 2013/2012**	**for 2012/2011**	**Three-year Average**	
Accenture plc	ACN	[c]	11.6%	11.4%	11.6%	11.5%
Analysts International Corp.	ANLY	[c]	–0.5%	0.5%	0.8%	0.3%
Bearing Point Ind.	BGPT	[c]	4.8%	6.7%	8.7%	6.7%
Cap Gemini Ernst & Young Group	CGEY	[c]	–0.1%	4.7%	9.8%	4.8%
Cognizant Technology Solutions Corp.	CTSH	[c]	19.7%	20.0%	19.1%	19.6%
Computer Sciences Corporation	CSC	[c]	6.6%	5.6%	6.2%	6.1%
Electronic Data Systems Corp.	EDS	[c]	8.7%	10.3%	9.5%	9.5%
Infosys Technologies Ltd.	INFY	[c]	29.0%	32.7%	33.2%	31.7%
Perot Systems Corp.	PER	[c]	10.2%	6.1%	6.7%	7.6%
Unisys Corporation	UIS	[c]	7.5%	4.5%	6.2%	6.1%
Wipro Ltd.	WIT	[c]	21.1%	23.8%	22.8%	22.6%
Selected Guideline Public Companies						
High Profit Margins			29.0%	32.7%	33.2%	
Low Profit Margins			–0.5%	0.5%	0.8%	
Median Profit Margins			8.7%	6.7%	9.5%	
Average Profit Margins			10.8%	11.5%	12.2%	
Selected Computer Software Developer's Profit			**11%**			

Footnotes:
[a] The Risk Management Association (RMA) 2014–2013, 2013–2012, and 2012–2011 *Annual Statement Studies* — Custom Computer Programming Services.
[b] The Risk Management Association (RMA) 2014–2013, 2013–2012, and 2012–2011 *Annual Statement Studies* — Computer Systems Design Services.
[c] Capital IQ Database.

valuation. In this example, the analyst is asked to estimate the fair market value of the copyrights and trade secrets related to the hypothetical Brown Family Company computer software. All of the Brown computer software is subject to copyright protection. The software source code and the systems documentation and user manuals are treated as company trade secrets.

The analyst is instructed that the appropriate valuation date for the family law matter is January 1, 2015.

The analyst decided to use the cost approach and the replacement cost new less depreciation method. *Table 1* includes the analysis of all four cost components of the cost approach. Exhibit 1 also illustrates the analyst's functional obsolescence considerations. *Table 2* presents the detailed calculation of

one cost approach component: the developer's profit analysis.

Based on the cost approach analysis summarized in Table 1, the analyst concludes that the fair market value of the Brown computer software copyrights and trade secrets, as of January 1, 2015, is $200 million.

Market Approach Valuation Methods

The analyst typically attempts to apply market approach methods first in the intellectual property valuation. This is because the market—that is, the economic environment in which arm's-length transactions between unrelated arm's-length parties occur—is often considered to provide the best indicator of value. However, the market approach will only provide meaningful valuation evidence when the marital estate intellectual property is sufficiently similar to the intellectual property transactions (by sale or license) in the marketplace. In that case, the guideline intellectual property transaction (sale or license) prices may indicate the expected price for the marital estate intellectual property.

Some consider cost avoidance as a cost approach measure.

There are two principal market approach intellectual property valuation methods:

(1) the comparable uncontrolled transaction (CUT) method and

(2) the comparable profit margin (CPM) method.

In the CUT method, the analyst searches for arm's-length sales or licenses of benchmark intellectual property. In the CPM method, the analyst searches for companies that provide benchmarks to the owner/operator company.

In the CUT method, the analyst will more likely rely on CUT license transactions than on sale transactions. This is because third-party licenses of intellectual property are more common than third-party sales of intellectual property. Nonetheless, for both sale and license transactions, the analyst will follow a systematic process in the CUT method valuation.

The Cut Method

First, the analyst researches the appropriate exchange markets to obtain information about sale or license transactions, involving guideline (*i.e.*, similar from an investment risk and expected return perspective) or comparable (*i.e.*, almost identical) intellectual property that may be compared to the marital estate intellectual property. Some of the comparison attributes include the intellectual property type, intellectual property use, industry in which the intellectual property operates, and date of sale or license.

Third-party licenses of IP are more common than third-party sales of IP.

Second, the analyst verifies the transactional information by confirming that

(1) The transactional data are factually accurate, and

(2) The sale or license exchange transactions reflect arm's-length market considerations.

If the guideline sale or license transaction was not conducted at arm's-length market conditions, then adjustments to the transactional data may be necessary. This verification procedure may also elicit additional information about the current market conditions for the sale or license of the intellectual property.

Third, the analyst selects relevant units of comparison (*e.g.*, income pricing multiples or dollars per unit—such as "per drawing" or "per line of code"). And, the analyst will develop a comparative analysis for each selected unit of comparison.

Fourth, the analyst compares the selected guideline or comparable intellectual property sale or license transactions with the marital estate intellectual property, using the selected elements of comparison. Then, the analyst adjusts the sale or license price of each guideline transaction for any differences between the guideline intellectual property and the marital estate intellectual property. If such comparative adjustments cannot be measured, then the analyst may eliminate the sale or license transaction as a guideline for future valuation consideration.

Fifth, the analyst selects pricing metrics for the marital estate intellectual property from the range of

Exhibit 1
Market Approach
Comparable Uncontrolled Transaction (CUT) Method
Common Intellectual Property License Transaction Databases

RoyaltySource

www.royaltysource.com—AUS Consultants produces a database that provides intellectual property license transaction royalty rates. The database can be searched by industry, technology, or keyword. The information provided includes the license royalty rates, name of the licensee and the licensor, a description of the intellectual property licensed (or sold, if applicable), the transaction terms, and the original sources of the information provided. Preliminary CUT results are available online and a final report is sent to the subscriber *via* email.

RoyaltyStat, LLC

www.royaltystat.com—RoyaltyStat is a subscription-based database of intellectual property license royalty rates and license agreements, compiled from Securities and Exchange Commission documents. It is searchable by SIC code or by full text. The CUT results can be viewed online or archived. The intellectual property transaction database is updated daily. The full text of each intellectual property license agreement in the database is available.

Royalty Connection

www.Royaltyconnection.com—Royalty Connection™ provides online access to intellectual property license royalty rates and other license information on all types of technology, patents, trade secrets, and know-how. The data are aggregated from information on all types of technology, patents, trade secrets, and know-how. The data are aggregated from arm's-length sale or license transactions, litigation settlements, and court-awarded royalty orders from 1990 to the present. The intellectual property license database is frequently updated. Users can search by industry, product category, or keyword. The information provided includes the consideration paid for the intellectual property license and any restrictions (such as geographic or exclusivity).

ktMINE

www.bvmarketdata.com—ktMINE is an interactive intellectual property database that provides direct access to license royalty rates, actual license agreements, and detailed agreement summaries. The database contains more than 7,800 intellectual property license agreements. The intellectual property license database is updated frequently. License agreements are searchable by industry, keyword, and various other parameters. The full text of each intellectual property license agreement is available.

pricing metrics indicated from the guideline or comparable transactions. The analyst may select pricing multiples in the low end, midpoint, or high end of the range of pricing metrics indicated by the transactional sale or license data. The analyst selects the subject-specific pricing metrics based on the analyst's comparison of the marital estate intellectual property to the guideline intellectual property.

The income approach focuses on the present value of future income.

Sixth, the analyst applies the selected subject-specific pricing metrics to the subject intellectual property financial or operational fundamentals (*e.g.*, revenue, income, number of drawings, number of lines of code, and so on). This procedure typically results in several market-derived value indications for the marital estate intellectual property.

Seventh, the analyst reconciles the various value indications provided by the analysis of the guideline sale or license transactions into a single market approach value indication. In this final reconciliation procedure, the analyst summarizes and reviews the transactional data and the quantitative analyses (*i.e.*, the various pricing metrics) that resulted in each value indication. Finally, the analyst resolves these value indications into a single value indication.

Exhibit 1 describes several of the databases that the analyst may search in order to select intellectual property sale or license CUTs.

Exhibit 2 describes several of the print sources that the analyst may search in order to select intellectual property sale or license CUTs. Of course, the analyst may confer with the marital parties to explore

Exhibit 2
Market Approach
Comparable Uncontrolled Transaction (CUT) Method
Common Intellectual Property License Transaction Print Sources

AUS Consultants publishes a monthly newsletter, *Licensing Economics Review*, that contains license royalty rates on selected recent intellectual property transactions. The December issue each year also contains an annual summary of intellectual property license royalty rates by industry.

Gregory J. Battersby and Charles W. Grimes annually author a book called *License Royalty Rates*, published by Aspen Publishers. This reference tool provides intellectual property license royalty rates for 1,500 products and services in 10 different licensed product categories: art, celebrity, character/entertainment, collegiate, corporate, designer event, music, nonprofit, and sports.

Intellectual Property Research Associates produces three books that contain information on license royalty rates for patents, trademarks, and copyrights. The books are *Royalty Rates for Trademarks & Copyrights*, *Royalty Rates for Technology*, and *Royalty Rates for Pharmaceuticals & Biotechnology*.

whether the marital estate operator has entered into any intellectual property license agreements (either inbound or outbound). These selected license agreements could relate to either the actual intellectual property or to comparable intellectual property.

The CPM Method

The CPM method is also based on a comparative analysis. However, in this valuation method, the analyst does not rely on the sales and licenses of comparable or guideline intellectual property. Rather, the analyst searches for comparable or guideline companies. The objective of the CPM method is to identify guideline companies that are comparative to the family company in all ways except one. The family company, of course, owns the actual intellectual property. Ideally, the selected guideline companies should provide a meaningful benchmark to the family company—except that they do not own comparable intellectual property.

Ideally, the CPM method guideline companies operate in the same industry as the family company, have the same types of raw materials and the same types of sources of supply, the same type of customers, and produce the same type of products or services. Ideally, the only difference should be that the family company has an established trademark, and the guideline companies have generic trademarks. Or, the family company owns the actual patent, and the guideline companies produce unpatented (and presumably inferior) products.

Because of the economic benefit that the intellectual property provides, the family company should earn a higher profit margin than the selected guideline companies. This profit margin comparison is usually made at the earnings before interest and taxes (or EBIT) level of income. This EBIT margin typically reflects the pretax operating income of the comparative companies—a measure of income that the intellectual property can influence. The incremental (or superior) profit margin earned by the family company can then be converted into an intellectual property implied royalty rate. Typically, all of the excess profit margin is assigned to the intellectual property (if the intellectual property is the only reason for the family company's superior profit margin).

The analyst estimated a 10-year RUL for the patent.

This implied royalty rate (derived from the excess profit margin) is then multiplied by the family company revenue in order to estimate the amount of implied royalty income generated from the intellectual property. This hypothetical royalty income is capitalized over the intellectual property expected RUL. The result of this capitalization procedure is an estimate of the intellectual property value, according to the CPM method.

Exhibit 3 presents a list of several publicly traded company data sources that the analyst may use to (1) select guideline companies for the CPM method analysis and (2) obtain guideline company profit margin information to use in the CPM method analysis.

Accordingly, there are several market approach intellectual property valuation methods. However, each method is based on comparative analyses of either comparable intellectual property sales, comparable intellectual property license royalty rates,

Exhibit 3
Market Approach
Comparable Profit Margin (CPM) Method
Common Data Sources for Guideline Company Profit Margins

FactSet Research Systems, Inc.—FactSet
Hoover's, Inc.—Hoover's Company Records
Mergent, Inc.—MergentOnline
Morningstar, Inc.—Morningstar Equity Research
Standard & Poor's—Capital IQ
Thomson Reuters—Thomson ONE Analytics

or comparable companies (that own generic intellectual property).

Market Approach Illustrative Example

Finally, *Table 3* presents an illustrative example of a market approach intellectual property valuation. In this example, the analyst is asked to estimate the fair market value of the hypothetical Green Family Company trademarks and trade names. Green is a telecommunications company. The analyst is instructed that the appropriate valuation date for the family law matter is as of January 1, 2015.

Do the valuation approach(es) and method(s) accomplish the family law assignment?

The analyst decided to use the market approach and the relief from royalty (RFR) method in this trademark valuation. *Table 4* summarizes the analyst's search for, selection of, and analysis of comparable uncontrolled transaction (CUT) trademark license agreements. Like Green, the CUT trademark license data are all related to the telecommunications industry.

Based on discussions with Green management and on research regarding comparable telecommunications industry trademark life cycles, the analyst determined that the average RUL of the subject trademarks was 20 years. Therefore, the valuation is based on a 20-year trademark royalty income projection period.

Based on the market approach valuation analysis summarized in *Table 3*, the analyst concluded a fair market value of $840 million for the Green trademarks and trade names, as of January 1, 2015.

Income Approach Valuation Methods

In this valuation approach, value is estimated as the present value of the future income from the ownership and operation of the marital estate intellectual property. The present value calculation has three principal components:

(1) An estimate of the duration of the intellectual property income projection period, typically measured as the analyst's estimate of the intellectual property RUL;

(2) An estimate of the intellectual property-related income for each period in the projection, typically measured as either owner income (*e.g.*, license royalty income), operator income (*e.g.*, some portion of the operator's business enterprise income), or both; and

(3) An estimate of the appropriate capitalization rate, typically measured as the required rate of return on an investment in the intellectual property

For purposes of the income approach, the RUL relates to the time period over which the marital estate expects to receive any income related to the intellectual property license, use, or forbearance of use. In addition to the term of the RUL, the analyst is also interested in the shape of the RUL curve. That is, the analyst is interested in the annual rate of decay of the future intellectual property income.

Different intellectual property income measures may be relevant. If properly applied, these different income measures can be used in the income approach to derive a value indication. Some of the different income measures include:

- gross or net revenue,
- gross income (or gross profit),
- net operating income,
- net income before tax,
- net income after tax,
- operating cash flow,

Table 3
Green Family Company
Trademarks and Trade Names
Market Approach—Relief from Royalty Method
Valuation Summary
As of January 1, 2015

	Projected Calendar Years				
Present Value of Discrete Projection Period Trademark Income:	**2015 $000**	**2016 $000**	**2017 $000**	**2018 $000**	**2019 $000**
Management-Provided Revenue Projection [a]	8,634,139	8,358,945	8,042,393	7,720,369	7,377,326
Arm's-Length Trademark License Royalty Rate [b]	2%	2%	2%	2%	2%
Projected Pretax Trademark Income	172,683	167,179	160,848	154,407	147,547
Less Projected Income Tax Rate [c]	37%	37%	37%	37%	37%
Projected After-Tax Trademark Income	108,790	105,323	101,334	97,277	92,954
Discounting Periods [d]	0.5000	1.5000	2.5000	3.5000	4.5000
Present Value Factor @ 11% [e]	0.9492	0.8551	0.7704	0.6940	0.6252
Present Value of Trademark Income	103,264	90,061	78,068	67,510	58,115
Sum of Present Value of Discrete Trademark Income	397,018				
Present Value of Terminal Period Trademark Income:					
Fiscal 2020 Normalized Trademark Income [f]	$ 92,954				
Present Value of an Annuity Factor [g]	7.579				
Terminal Value of Trademark Income	704,498				
Present Value Factor @ 11%	0.6252				
Present Value of Terminal Value	$ 440,452				
Trademark Valuation Summary:					
Present Value of Discrete Period Trademark Income	$ 397,018				
Present Value of Trademark Terminal Value	440,452				
Indicated Fair Market Value of the Green Trademarks (rounded)	$ 840,000				

Footnotes:

[a] Revenue projection provided by Green management, consistent with the company's long-range financial plan.

[b] Based on an analysis of arm's-length license agreements between parties for similar property, as presented in Exhibit 4.

[c] Based on the Green expected effective income tax rate.

[d] Calculated as if cash flow is received at mid-year.

[e] Based on the Green weighted average cost of capital of 11 percent.

[f] Based on the 2019 projected after-tax trademark income and an expected long-term growth rate of zero percent.

[g] Based on a present value of an annuity factor for an 11 percent discount rate and a 15-year expected RUL.

- net cash flow,
- incremental income,
- differential income,
- royalty income,
- excess earnings income, and
- several others (such as incremental income).

Because there are different income measures that may be used in the income approach, it is important for the capitalization rate (either the discount rate or the direct capitalization rate) to be derived on a basis consistent with the income measure used.

There are several categories of valuation methods that may be used to value marital estate intellectual property:

- *Valuation methods that quantify an incremental level of intellectual property income.* That

Table 4
Green Family Company
Trademarks and Trade Names
Market Approach—Relief from Royalty Method
CUT Trademark License Transactions

Trademark Licensor	Trademark Licensee	Comparable Uncontrolled Transaction (CUT) Trademark License Description	License Start Year	License Royalty Rate Range		License Upfront/ Flat Fee
Southwestern Bell Telephone	Telco Group	The royalty fee is for the right to use the name, reputation, and public image of the Southwestern Bell Telephone Company.	2012	5.0%	5.0%	NA
Cable and Wireless PLC	Hong Kong Telecommunications Ltd.	Cable and Wireless entered into an agreement with a Hong Kong telephone company for the use of its trademarks on relevant products and services.	2012	8.0%	8.0%	NA
AT&T Corp.	KIRI Inc.	The licensor grants to the licensee a license to use the licensed marks (AT&T and globe design logo) solely in connection with telecommunication and Internet services in the licensed territory.	2013	2.50%	4.00%	$2.5 million minimum guarantee
Nextel	Nextel Partners	A license between a US company and a publicly owned spin off company for rights to use the Nextel brand name. The licensee owns its own spectrum and provides services as Nextel.	2012	0.50%	1.00%	0
France Telecom (Orange Brand Services Limited, UK)	PTK Centertel	PTK Centertel is rebranding its name from Idea to Orange. Idea will change its name and logo (trademark). PTK Centertel will pay France Telecom a royalty for use of the Orange name.	2013	1.6%	1.6%	NA
Qwest Communications International, Inc. [a]	Unical Enterprises, Inc.	An exclusive right to use the following trademarks: B Office, Bell Symbol, Bell mark, Northwestern Bell in connection with corded telephones, cordless telephones, answering machines, and telephone/answering devices.	2013	2.1%	2.2%	NA
Virgin Enterprises Limited	NTL Inc.	The licensee is entitled to use certain Virgin trademarks in the mobile phone telecommunications industry within the United Kingdom and Ireland.	2013	0.25%	0.25%	£8.5 million minimum annual royalty

NA = Not applicable

	Indicated CUT License Agreement Royalty Rate Range	
	Low Indications	High Indications
High Rate	8.0%	8.0%
Low Rate	0.3%	0.3%
Mean Rate	2.9%	3.2%
Median Rate	2.1%	2.2%

Table 5
Black Family Company
Valuation of White Pharmaceutical Product Patent
Income Approach—Yield Capitalization Procedure
As of January 1, 2015

		Pro Forma Years									
Valuation of the White Product Patent	**Notes**	**12/31/15 $000**	**12/30/16 $000**	**12/30/17 $000**	**12/30/18 $000**	**12/31/19 $000**	**12/30/20 $000**	**12/30/21 $000**	**12/30/22 $000**	**12/31/23 $000**	**12/30/24 $000**
White Product Revenue		4,643,232	4,450,217	4,184,750	3,880,112	3,548,858	3,548,858	3,548,858	3,548,858	3,548,858	3,548,858
Annual Growth Rate Percent		–1.2%	–4.2%	–6.0%	–7.3%	–8.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Estimated Product Attrition Rate 23%	[a]										
Revenue Attributable to the Product Patent		3,575,289	2,604,350	1,849,994	1,289,821	883,047	679,946	523,559	403,140	310,418	239,022
Annual Growth Rate Percent	[b]	NA	–27.2%	–29.0%	–30.3%	–31.5%	–23.0%	–23.0%	–23.0%	–23.0%	–23.0%
EBITDA		1,573,127	1,145,914	813,997	567,521	388,541	299,176	230,366	177,382	136,584	105,170
EBITDA Margin	[c]	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%
Less: Depreciation/Amortization Expense		793,018	552,967	375,423	248,354	160,263	123,402	95,020	73,165	56,337	43,380
Percentage of Revenue	[d]	22.2%	21.2%	20.3%	19.3%	18.1%	18.1%	18.1%	18.1%	18.1%	18.1%
EBIT		780,109	592,947	438,575	319,167	228,278	175,774	135,346	104,216	80,247	61,790
EBIT Margin		21.8%	22.8%	23.7%	24.7%	25.9%	25.9%	25.9%	25.9%	25.9%	25.9%
Less: Income Taxes @ 37%		288,640	219,390	162,273	118,092	84,463	65,036	50,078	38,560	29,691	22,862
Net Income		491,469	373,557	276,302	201,075	143,815	110,738	85,268	65,656	50,556	38,928
Net Margin		13.7%	14.3%	14.9%	15.6%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%
Plus: Depreciation/Amortization Expense		793,018	552,967	375,423	248,354	160,263	123,402	95,020	73,165	56,337	43,380
Less: Charges for the Use of Contributory Assets:											
Working Capital Capital Charge	[e]	27,530	20,053	14,245	9,932	6,799	5,236	4,031	3,104	2,390	1,840
Tangible Assets Capital Charge	[f]	(823,022)	(599,454)	(425,589)	(296,467)	(202,736)	(156,107)	(120,202)	(92,556)	(71,268)	(54,876)
Routine Intangible Assets Capital Charge	[g]	(164,756)	(123,965)	(91,524)	(66,472)	(47,625)	(36,671)	(28,237)	(21,742)	(16,742)	(12,891)
Equals: Patent Income		324,239	223,159	148,856	96,422	60,516	46,598	35,880	27,627	21,273	16,381
Discounting Periods	[h]	0.5000	1.5000	2.5000	3.5000	4.5000	5.5000	6.5000	7.5000	8.5000	9.5000
Present Value Factor @ 11%		0.9492	0.8551	0.7704	0.6940	0.6252	0.5633	0.5075	0.4572	0.4119	0.3710
Present Value of Patent Income		307,767	190,823	114,679	66,917	37,834	26,249	18,209	12,631	8,762	6,077

Present Value of Patent Income (2015–2024)	789,949									
Indicated Fair Market Value of the White Product Patent	$790,000									

Footnotes:

[a] Considers the historical weighted decay rates for the White product revenue.

White Product Line	2012	2013	2014	Three-Year Average
Weighted Annual Revenue Decay Rate	23.4%	23.6%	23.3%	23.4%

[b] Represents 77% of the White product revenue in 2015 based on the estimated attrition rate. Thereafter, the product revenue is decreased annually based on (1) the estimated attrition rate and (2) the negative annual growth rate.

[c] The projected 2019 EBITDA margin is maintained after 2019.

[d] The projected 2019 depreciation expense as a percent of revenue is maintained after 2019.

[e] Based on (1) working capital requirement for the product and (2) the return on working capital estimated based on the Black weighted average cost of capital (WACC).

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Working Capital – % of Black Consolidated Revenue		–7%	–7%	–7%	–7%	–7%	–7%	–7%	–7%	–7%	–7%
Working Capital Requirement (times product revenue)		(250,270)	(182,305)	(129,500)	(90,287)	(61,813)	(47,596)	(36,649)	(28,220)	(21,729)	(16,732)
Return on Working Capital	11%	(27,530)	(20,053)	(14,245)	(9,932)	(6,799)	(5,236)	(4,031)	(3,104)	(2,390)	(1,840)

[f] Equals the sum of projected capital expenditure allocated to the product based on (1) % of revenue and (2) the return on tangible assets requirement estimated (based on the Black WACC).

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Net Tangible Assets as % of Black Consolidated Revenue (*see* Exhibit 7)		113%	113%	113%	113%	113%	113%	113%	113%	113%	113%
Tangible Assets Requirement (times product revenue)		4,038,767	2,941,962	2,089,816	1,457,025	997,520	768,090	591,430	455,401	350,659	270,0070
Return on Tangible Assets	11%	444,264	323,616	229,880	160,273	109,727	84,490	65,057	50,094	38,572	29,701

[g] Routine intangible assets contributory asset charge as percent of Black consolidated revenue multiplied by the revenue attributable to the White product.

[h] Calculated as if all cash flow received at midyear.

is, the family business will expect a greater level of revenue (however measured) by owning/operating the intellectual property as compared to not owning/operating the intellectual property. Alternatively, the family business may expect a lower level of costs—such as capital costs, investment costs, or operating costs—by owning/operating the intellectual property as compared to not owning/operating the intellectual property.

- *Valuation methods that estimate a relief from a hypothetical license royalty payment.* That is, these relief from royalty (RFR) methods estimate the amount of hypothetical royalty payment that the family business (as licensee) does not have to pay to a third-party licensor for the use of the intellectual property. The marital estate is "relieved" from having to pay this hypothetical license royalty payment for the use of the intellectual property. This is because the marital estate, in fact, owns the intellectual property.

- *Valuation methods that estimate a residual measure of intellectual property income.* That is, these methods typically start with the family business overall business enterprise income. Next, the analyst identifies all of the tangible assets and routine intangible assets (other than the intellectual property) that are used in the family business. These assets are typically called contributory assets. The analyst then multiples a fair rate of return by the value of each of the contributory assets. The product of this multiplication is the fair return on all of the contributory assets. The analyst then subtracts the fair return on the contributory assets from the family business total income. This residual (or excess) income is the income that is associated with the intellectual property.

- *Valuation methods that rely on a profit split.* That is, these methods typically also start with the family business overall income. The analyst then allocates or "splits" this total income between the family business tangible assets and routine intangible assets and the intellectual property. The profit split percent (*e.g.*, 20 percent, 25 percent, and so on) to the intellectual property is typically based on the analyst's functional analysis of the family business operations. This functional analysis identifies the relative importance of the intellectual property and the contributory assets to the production of the family business total income.

- *Valuation methods that quantify comparative income.* These methods compare the family business income to a benchmark measure of income (that, presumably, does not benefit from the use of the intellectual property). Common benchmark income measures include: (1) the owner/operator income before the intellectual property development, (2) industry average income levels, or (3) selected guideline publicly traded company income levels. A common measure of income for these comparative analyses is the earnings before interest and taxes (or EBIT) margin. This EBIT income is considered to be a pretax measure of operating income. When publicly traded companies are used as the comparative income benchmark, the method is often called the comparable profit margin (or CPM) method.

All of these income approach valuation methods can be applied using either the direct capitalization procedure or the yield capitalization procedure.

In the *direct capitalization procedure*, the analyst first estimates a normalized income measure for one future period (typically, one year) and then divides that measure by an appropriate investment rate of return, called the direct capitalization rate. The direct capitalization rate may be derived for perpetuity or a specified finite time period. This decision will depend on the analyst's estimate of the intellectual property RUL.

The analyst may conclude that the intellectual property has a finite RUL. In that case, the analyst may use the yield capitalization procedure. Or, the analyst may use the direct capitalization procedure with a limited life direct capitalization rate. Mathematically, the limited life capitalization rate is typically based on a present value of annuity factor (PVAF) for the intellectual property RUL.

In the *yield capitalization procedure*, the analyst projects the appropriate income measure for several future time periods. The discrete time period is typically based on the intellectual property RUL. This income projection is converted into a present value by the use of a present value discount rate. The present value discount rate is the investor's required rate of return—or yield capitalization rate—over the expected term of the income projection.

The result of either the direct capitalization procedure or the yield capitalization procedure is the income approach value indication for the marital estate intellectual property.

Income Approach Illustrative Example

Table 5 presents an illustrative example of an income approach intellectual property valuation. In this example, the analyst is asked to estimate the fair market value of the hypothetical Black Family Company pharmaceutical product patent. As described later, the Black patent is used to manufacture the White pharmaceutical product. The analyst is instructed that the appropriate valuation date for the family law matter is January 1, 2015.

The analyst decided to use the income approach and the excess earnings method. Because the product revenue is expected to change at a nonconstant rate over time, the analyst decided to use the yield capitalization procedure. Using this procedure, this valuation method is often called the multiperiod excess earnings method (or MEEM).

Based on the remaining legal life of the Black patent and the White product revenue decay rate (considering the effect of a competitive drug product), the analyst estimates a 10-year RUL for the patent.

Management provided the analyst with financial projections for both the Black consolidated results and the White product. The analyst performed a revenue decay rate analysis related to the White product in order to conclude a patent revenue growth rate (or, in this case, decay rate).

Table 6 presents the projection of the product revenue and profit over its expected 10-year RUL. The

Table 6
Black Family Company
Valuation of the White Pharmaceutical Patent
Income Approach—Yield Capitalization Procedure
Contributory Asset Capital Charge Analysis

Tangible Assets Capital Charge:	**FYE 12/31/15 $000**				
Beginning Tangible Assets [a]	12,034,000				
Capital Expenditures [a]	1,162,971				
Depreciation Expense [a]	(2,249,209)				
Net Tangible Assets	10,947,762				
Black Consolidated Revenue [a]	9,691,426				
Net Tangible Assets as % of Black Consolidated Revenue	113%				
Routine Intangible Assets Capital Charge:	[a]	[b]			
	Fair Market Value $000	Estimated Required Rate of Return	Annual Return $000		
Trademarks/Trade Names	970,000	11%	106,700		
Internally Developed Computer Software	2,510,000	11%	276,100		
Trained and Assembled Workforce	580,000	11%	63,800		
Total Contributory Intangible Assets			446,600		
	12/31/15 $000	**12/31/16 $000**	**12/31/17 $000**	**12/31/18 $000**	**12/31/19 $000**
Black Consolidated Revenue [a]	9,691,426	9,382,534	9,027,219	8,665,762	8,280,712
Intangible Assets Capital Charge (from above analysis)	446,600	446,600	446,600	446,600	446,600
Intangible Asset Capital Charge as % of Black Consolidated Revenue	4.6%	4.8%	4.9%	5.2%	5.4%

Footnotes:
[a] From the Black business plan.
[b] Based on the Black weighted average cost of capital.

analyst estimated an appropriate capital charge on all of the Black contributory assets, including working capital assets, tangible assets, and routine (nonpatent) intangible assets. This contributory asset analysis is summarized in *Table 6*.

Let's assume the analyst used the Black 11 percent WACC as the discount rate and capital charge return on investment.

Based on the income approach valuation analysis summarized in *Table 5*, the analyst estimated that the fair market value of the Black patent on the White product was $790 million, as of January 1, 2015.

Valuation Synthesis and Conclusion Procedures

In the valuation synthesis and conclusion process, the analyst should consider the following question: Do the selected valuation approach(es) and method(s) accomplish the analyst's family law assignment?

The analyst should also consider whether the selected valuation approach and method analyzes the appropriate intellectual property bundle of legal rights. The analyst should consider whether there were sufficient empirical data available to perform the selected valuation approach and method. That is, the valuation synthesis should consider whether there were sufficient data available to make the analyst comfortable with the analysis conclusion. In addition, the analyst should consider whether the selected approach and method will be understandable to the intended audience for the family law intellectual property valuation.

CONCLUSION

A marital estate can own (or license) intellectual property directly—as an individual patent, copyright, trademark, or trade secret. Or, a marital estate can own (or license) an intellectual property indirectly—through its ownership of a family-owned/operated business.

A valuation analyst may be asked to value marital estate intellectual property for a variety of reasons. The first part of this two-part article (which appeared in the previous issue of the *American Journal of Family Law*) summarized both the general reasons and the family law reasons for valuing intellectual property. That discussion also summarized the analyst's due diligence procedures in the intellectual property valuation. In this part of the article I described and illustrated the generally accepted intellectual property valuation approaches, methods, and procedures. This discussion explained the analyst procedures related to performing intellectual property valuation analysis—including a description of common data sources.