



AMERICAN SOCIETY OF APPRAISERS

Business Valuation

Fair Value

Niche Topics

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MIRAGE HOTEL & CASINO → OCTOBER 18-21, 2015 → LAS VEGAS

Patent Valuation

Practical Applications



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Robert holds a BA degree in economics and an MBA degree in finance, both from Columbia University. He is a certified public accountant, accredited in business valuation, and certified in financial forensics. He is also a chartered financial analyst, chartered global management accountant, certified management accountant, certified business appraiser, and certified valuation analyst.

Robert is the co-author of 12 books, including *Guide to Intangible Asset Valuation* (revised edition published by the AICPA in 2014) and *Practical Guide to Bankruptcy Valuation* (published by the American Bankruptcy Institute in 2013).

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Discussion Outline

- Types of intellectual property (IP)
- Reasons to analyze intellectual property
- Types of patents
- Patent-related intangible assets
- Generally accepted valuation approaches and methods
- Cost approach patent valuation example
- Market approach patent valuation example
- Income approach patent valuation example
- Summary and conclusion



Types of Intellectual Property

- An IP is a commercial intangible asset that enjoys special legal recognition and legal protection.
- The IP special legal status comes from either federal or state statutes.
- There are four types of IP:
 - Patents
 - Copyrights
 - Trademarks
 - Trade secrets
- Often, there are other commercial intangible assets associated with the subject IP.
- IP assets are a specific subset of commercial intangible assets.



Differences Between Intellectual Property and Other Commercial Intangible Assets

- IP assets are created under and protected by specific federal or state statutes
 - Often, IP assets are registered with the USPTO or USCO
 - There is a substantial body of judicial precedent with regard to IP infringement and other types of litigation
 - Analysts can consider this judicial guidance with regard to valuation and damages methodology
 - IP assets are routinely licensed—and sometimes separately sold—in arm’s-length transactions
 - Analysts can rely on these comparable uncontrolled transaction (CUT) license royalty rate and sale price data



Differences Between Intellectual Property and Other Commercial Intangible Assets (cont.)

- Other intangible assets are either operated by the current owner or sold to a new owner. IP can be both operated by the current owner and licensed to a noncompeting operator.
- Therefore, the HABU of an IP may be both value in use and value in exchange.
- IP assets can generate both operating income and royalty income.
- It is often easier to identify incremental or differential income metrics related to IP



Differences Between Intellectual Property and Other Commercial Intangible Assets (cont.)

- It is often easier to apply market approach valuation methods to IP
- Owner/operators often maintain development cost data with regard to IP—so it is easier to apply cost approach valuation methods to IP assets
- Owner/operators do a better job at documenting the existence of (and protection of) their IP



Types of Patents

- Design patent – new, original, or ornamental design for an article of manufacture; the term is 15 years from date of the patent grant
- Utility patent – covers the following inventions: a process, a machine, a manufacture, or a composition of matter; the term is 20 years from date of patent application filing; in certain instances, a one-time extension of 5 years may be granted; applications can be provisional or nonprovisional



Types of Patents (cont.)

- Plant patent – for invention or discovery of a new and distinct variety of asexually reproduced plant; the term is 20 years from date of patent application filing
- Inventor applies to—and patent is granted by—the USPTO
- Protected by U.S. Patent Act, Title 35 United States Code
- Patent requirements: useful, novel, nonobvious



Related Intangible Assets

- Patent applications (provisional or nonprovisional)
- Technology sharing agreements
- Unpatented proprietary technology
- Technology development rights
- Engineering drawings and designs
- Schematics and technical documentation
- Regulatory approvals and licenses (e.g., FDA approvals, OSHA approvals)



Patent Valuation Due Diligence Procedures

- Develop a clear and complete definition of the subject patent
 - Subject bundle of patent legal rights
 - Fee simple
 - Term/reversion interest
 - Licensor/licensee interest
 - Domestic/international interest
 - Product line/industry interest
 - Any inbound or outbound licenses related to the subject patent



Patent Valuation Due Diligence Procedures (cont.)

- If there is a patent license, consider the following:
 - Patent licensor/licensee responsibilities
 - Legal protection
 - R&D expenditures
 - Marketing expenditures
 - Licenses, permits, regulatory approvals
 - Other patent contract terms
 - Minimum use, production, sales
 - Minimum marketing, commercialization expense
 - R&D technology development, completion payments
 - Obtain required approvals
 - Milestone license payments



Patent Data Gathering and Due Diligence Procedures

- Patent analysis to the current owner/operator (use/user)
 - Historical and prospective financial statements
 - Historical and prospective development and maintenance costs
 - Current and expected resource/capacity constraints
 - Description and estimate of the patent economic benefits
 - Revenue (increase unit price/volume, market size/position)
 - Expense (decrease product returns, COGS, SG&A, R&D)
 - Investment (inventory, capx)
 - Risk (contracts, cost of capital)
 - Change in market definition or size
 - Change in alternative/competitive uses
 - Patent creates inbound/outbound license opportunities
 - Owner both operates and licenses patent (in different products, territories, distribution channels)



Patent Data Gathering and Due Diligence Procedures (cont.)

- Analyze projections and patent economic benefits against a benchmark comparison
 - Prior projections vs. prior actual results
 - Current projections vs. capacity constraints
 - Current projections vs. market size
 - Consider industry average comparable profit margins (CPM)
 - Consider guideline public company comparable profit margins
 - Consider quality and quantity of guideline patent license data



Patent Data Gathering and Due Diligence Procedures (cont.)

- Analyze projections and patent economic benefits against a benchmark comparison (cont.)
 - Consider patent RUL analysis based on:
 - legal/statutory life
 - contract/license life
 - technology obsolescence life
 - economic obsolescence life
 - prior generations of the subject invention
 - position of the subject invention in its life cycle



Patent Data Gathering and Due Diligence Procedures (cont.)

- Analyze projections and patent economic benefits against a benchmark comparison (cont.)
 - Data sources commonly used to identify industry average profit margins for patent owner/operators:
 - Financial Research Associates—*Financial studies of the Small Business*
 - The Risk Management Association—*Annual Statement Studies: Financial Ratio Benchmarks*
 - BizMiner (The Brandow Company)—*Industry Financial Profiles*
 - CCH, Inc.—*Almanac of Business and Industry Ratios*
 - Fintel, LLC—*Fintel Industry Metrics Reports*
 - MicroBilt Corporation (formerly IntegralInfo)—*Integra Financial Benchmarking Data*
 - ValueSource—*IRS Corporate Ratios*
 - Schonfeld & Associates, Inc.—*IRS Corporate Financial Ratios*



Generally Accepted Patent Valuation Approaches and Methods

- Cost approach methods
 - Reproduction cost new less depreciation method
 - Replacement cost new less depreciation method
 - Trended historical cost less depreciation method
- Market approach methods
 - Relief from royalty method
 - Comparable uncontrolled transactions method
 - Comparable profit margin method
- Income approach methods
 - Differential income (with/without) method
 - Incremental income (before/after) method
 - Profit split method (or residual profit split method)
 - Residual (excess) income method



Patent Cost Approach Valuation Components

- Typical cost approach valuation formula

Replacement cost new

less: Physical depreciation

less: Functional obsolescence

less: Economic obsolescence

equals: Value indication



Patent Cost Approach Valuation Considerations

- All cost approach methods include a current cost measurement and a depreciation measurement
- Four cost components
 - Direct costs (internal direct materials and direct labor)
 - Indirect costs (external legal and development expenses)
 - Developer's profit (on the direct and indirect costs)
 - Entrepreneurial incentive (opportunity cost—or lost income—during the replacement period)
- Three depreciation components
 - Physical depreciation (not a significant factor)
 - Functional/technological obsolescence (consider the patent RUL)
 - Economic/external obsolescence (consider the patent ROI)



Patent Cost Approach Valuation Components (cont.)

- Cost approach valuation considerations
 - Particularly relevant for recently developed invention, for which development cost or development effort data are available
 - Also applicable for in-development or noncommercialized (e.g., defensive use) invention
 - All cost components (including opportunity cost) included in the measurement
 - Treatment of excess capital (development) costs and excess operating costs
 - Consideration of the patent RUL
 - Consideration of owner/operator economic obsolescence



Cost Approach – RCNLD Method Example

Alpha Company
 Omega Compound Patent Valuation
 Cost Approach—Replacement Cost New Less Depreciation (RCNLD) Method
 As of January 1, 2015

Product Development Stages	Estimated Replacement Development Effort in Person Months [a]	Time to Develop Replacement (in Calendar Months) [b]	Indicated RCNLD Component [c] \$000
Initial compound	4,531	29	66,100
Product compound	575	25	8,400
Initial stage product tests	3,304	16	48,200
Second stage product tests	1,229	5	17,900
Third stage product tests	1,807	41	26,400
Final FDA license process	325	12	4,700
Branding and marketing	<u>85</u>	9	<u>1,200</u>
Total direct and indirect costs	11,856	24	172,900
Plus developer's profit [d]			10,500
Plus entrepreneurial incentive [e]			<u>31,200</u>
Equals: Total replacement cost new			214,600
Less: Depreciation and obsolescence [f]			<u>16,000</u>
Equals: Replacement cost new less depreciation			198,600
Fair market value of Omega compound patent (rounded)			<u>200,000</u>



Cost Approach – RCNLD Method Example (cont.)

Notes:

- [a] Based on Alpha Company employee time records and laboratory notebooks—related to this recently developed (and not yet commercialized) drug compound patent.
- [b] Based on the actual elapsed development time for the omega product and for similar Alpha Company pharmaceutical products.
- [c] Based on \$14,585 per person-month—i.e., the actual weighted average full absorption cost of all Alpha Company employees who worked on the omega compound development project (stated in 1/1/15 dollars).
- [d] Based on the total direct costs plus indirect costs times the typical profit margin for an independent laboratory/compound development firm.
- [e] Expected lost profit (net cash flow) during the first 24 months (i.e., the elapsed replacement period) of the omega drug commercialization process.
- [f] Based on the RCN of 1,100 person-hours related to the development of any unsuccessful or uncommercialized compound features. Should also consider the patent RUL and the patent ROI.



Patent Market Approach Valuation Components

- Valuation pricing metrics are based on either comparable or guideline
 - Licenses of patents (relief from royalty method)
 - Sales of patents (comparable uncontrolled transactions method)
 - Companies that own patents (comparable profit margin method)



Patent Market Approach Valuation Considerations

- Valuation variables and procedures
 - Quantitative/qualitative analysis of the subject patent
 - Guideline license/sale/company selection criteria
 - Guideline license/sale/company selection
 - Verification of the selected transactional data
 - Analysis of the selected transactional data
 - Selection of the appropriate pricing metrics
 - Selection of the pricing multiples specific to the subject patent
 - Application of the selected pricing multiples to the subject patent metrics



Data Sources Commonly Used to Identify Guideline Companies and Comparable 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



Data Sources Commonly Used to Identify Patent CUT Royalty Rates

- IntangibleSpring
- ktMINE
- RoyaltyRange
- RoyaltySource
- RoyaltyStat, LLC
- Industry-specific databases



Data Sources Commonly Used to Identify Patent CUT Royalty Rates (cont.)

- IntangibleSpring – a subscription-based database of royalty rates sourced from license agreements filed with the SEC. Using a combination of text mining, natural language processing, and manual review, this database identifies and extracts complete license agreements from filings with the SEC. This database excludes agreements with incomplete pricing data.



Data Sources Commonly Used to Identify Patent CUT Royalty Rates (cont.)

- ktMINE – an interactive IP database that provides direct access to license royalty rates, actual license agreements, and detailed agreement summaries. The database contains over 16,000 IP license agreements. The IP license database is updated frequently. License agreements are searchable by industry, keyword, and various other parameters. The full text of each IP license agreement is available at www.bvmarketdata.com or www.ktmine.com.



Data Sources Commonly Used to Identify Patent CUT Royalty Rates (cont.)

- RoyaltyRange – a U.K.-based IP royalty rate database. The database consists of manually gathered and analyzed data. The reports contain more than 50 detailed standardized comparability factors on royalty rates and license terms. Each report is supplemented with original unredacted agreements, as well as filings and other types of documents the data are gathered from. The database focuses on European transactions, but also contains some U.S. transactions. The database excludes agreements between related parties, agreements with undisclosed remuneration mechanisms, royalty-free agreements, agreements where royalties are expressed in other forms than percentage, agreements with individuals, universities, and other noncommercial entities. It is available at www.royaltyrange.com.



Data Sources Commonly Used to Identify Patent CUT Royalty Rates (cont.)

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



Data Sources Commonly Used to Identify Patent CUT Royalty Rates (cont.)

- RoyaltyStat, LLC – a subscription-based database of IP license royalty rates and license agreements, compiled from SEC documents. It is searched by SIC code or by full text. The results can be viewed online or archived. The IP transaction database is updated daily. The full text of each IP license agreement in the database is available at www.royaltystat.com.



Data Sources Commonly Used to Identify Patent CUT Royalty Rates (cont.)

- Industry-specific databases (example: Recap IQ and Recap Explorer) – a database, now owned by Thomson Reuters, provides royalty rate, profit split, and other data for biotechnology and pharmaceutical company license and sales transactions. The database allows the user to tabulate guideline transactions, examines alternative deal structures, and evaluates drugs in biopharma pipelines with respect to probabilities of success, termination analysis, and development timelines. Access to the unredacted contracts is included. It is available at www.recap.com.



Common Royalty Rate Publications

- Licensing Economic Review – AUS Consultants publishes this monthly newsletter, which 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.



Common Royalty Rate Publications (cont.)

- License Royalty Rates – Gregory J. Battersby and Charles W. Grimes author this annual book, which is 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.



Common Royalty Rate Publications (cont.)

- Intellectual Property Research Associates – Intellectual Property Research Associates publishes 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*. These books are updated periodically.



The Royalty Rate Selection Process

- The factors to consider in the royalty rate selection process include:
 - the type of patent
 - a single property or multiple properties
 - de novo or seasoned patent
 - in process, developed, or commercialized patent
 - new vs. seasoned territory of licensor/licensee
 - new vs. seasoned products/services covered
 - length of the license term
 - license term start and stop dates



The Royalty Rate Selection Process (cont.)

- The factors to consider in the royalty rate selection process include: (cont.)
 - sale/license, or other type of transfer
 - transfer between independent parties
 - type of license compensation:
 - royalty rate
 - profit split
 - cost plus
 - type of royalty rate formula:
 - % of revenue
 - % of gross profit
 - % of net profit



Typical Royalty Rate Data Analysts Need

- Analysts typically need to consider two types of royalty rate data:
 - Actual compensation data (raw data)
 - Normalization adjustment data
- The base rate is the contractual compensation specified in the license agreement. These data include the “noise” of the actual royalty consideration arrangements.
- The adjustment data are the license-specific terms needed to “normalize” CUT royalty arrangements to make them more comparable to the subject transaction.
- So, analysts need to read CUT license agreements.



License-Specific “Noise” Often Encountered in CUT Data

- CUT license agreements often include terms that should be analyzed and adjusted in order to make the CUTs more comparable to the subject patent.
- These normalization adjustments typically reduce the “noise” in what appears to be a wide range of aberrational and unrelated royalty rate data.



License-Specific “Noise” Often Encountered in CUT Data (cont.)

- Some of the common normalization adjustments that analysts may look for:
 - Upfront fixed payments
 - Milestone fixed payments
 - Minimum/maximum fixed payments
 - Litigation settlements
 - Intercompany transfers
 - Equity as part of license
 - Short/long license terms
 - IP sale—not a license
 - Royalty rate—no % of sales
 - Royalty on sublicense income
 - Multiple IP in the license
 - Product sale/distribution agreements
 - Main/complementary products
 - Relation to other agreements



Other Factors That Affect License Royalty Rates

- In addition to license-specific “noise” terms, industry and other general factors affect royalty rate levels.
- Analysts should consider these general factors that affect royalty rates when analyzing CUT data:
 - State of the economy
 - Size of the subject industry
 - Growth of the subject industry
 - Profitability of the subject industry
 - Market position of the subject patent
 - Market position of CUT patent
 - Position in life cycle of subject patent
 - Position in life cycle of CUT patent



Three Procedures to Manage “Noise” in Royalty Rate Data

- Analysts generally use one of three procedures to manage the noise of anomalous royalty rate data:
 - Eliminate the anomalous observations from the selected royalty rate data
 - Quantitatively adjust for the impact of the normalization factors
 - Qualitatively assess the impact of the normalization factors
 - In addition to these three procedures, analysts use central tendency analyses that minimize the impact of the anomalous observations:
 - Median royalty rate
 - Trimmed mean royalty rate
 - Interquartile range of royalty rates



Three Procedures to Manage “Noise” in Royalty Rate Data (cont.)

- It is generally appropriate for analysts to eliminate from consideration those anomalous observations that cannot be normalized or adjusted
- It is generally inappropriate for analysts to eliminate from consideration those anomalous observations just because they fall outside of the typical range (i.e., because they are not Goldilocks observations)



Analyst Caveats in the Use of License Royalty Rate Data

- Use several IP license databases, if possible
- Know what IP you are analyzing, what industry you are analyzing, and what bundle of legal rights you are analyzing
- Print and read each license agreement that may provide empirical royalty rate data
- Examine the license agreement for terms and conditions that will justify elimination, adjustment, or assessment—or reliance on the license royalty rate



Market Approach – Relief from Royalty Method Example

- The assignment is to estimate the fair market value of the Beta Company patent in the psi pharmaceutical compound.
- The analyst will look for CUT royalty rates in order to apply the market approach relief from royalty valuation method.
- The psi patent compound was developed to cure the debilitating disease called midginitis. Victims of midginitis are unusually short of stature and, often, socially awkward. The disease symptoms are often mistaken for the symptoms of pygmy syndrome or dwarfism.



Illustrative Royalty Rate Search Criteria

- SIC Code 2834, pharmaceuticals industry
- Technology intangibles and manufacturing/process intangibles
- Either the licensor or the licensee is a U.S. company
- No territory restrictions
- No restrictions on the type of the agreement
- No restrictions on the license start date or stop date



Initial Royalty Rate Search Results

- ktMINE – initial search identified 72 patent license agreements
- RoyaltySource – requested 30 randomly selected patent license agreements
- The identified license royalty rates ranged from 2% of product revenue to 100% of sublicense revenue
- Numerous royalty rates were expressed as:
 - % of gross profits
 - % of net profits
 - \$ per kilogram
 - % of manufacturing costs
 - \$ per time period
 - fixed \$ amount
- How does the analyst make sense of over 100 divergent royalty rate data points?



Types of Patent License Agreements in the Commercial IP Databases

- These types of agreements may be eliminated (from consideration), adjusted (quantitatively normalized), or assessed (qualitatively):
 - territory production/manufacturing agreements
 - territory distribution agreements
 - sublicense agreements
 - trademark license agreements
 - intercompany transfer price agreements
 - non-patent technology licenses
 - asset sale agreements
 - joint development agreements
 - joint venture agreements
 - access to product data and library of research
 - IP infringement settlement agreements
 - stockholder litigation settlement agreements
 - technical assistance agreements



Types of Products Included in Databases

- These products may be eliminated (from consideration), adjusted (quantitatively normalized), or assessed (qualitatively) :
 - generic drugs
 - cosmetic products
 - non-human drugs
 - medical and surgical devices
 - radiation delivery systems
 - over-the-counter products
 - dietary supplement products
 - nonprescription skin care products
 - multiple pharmaceutical products (product portfolios)
 - multiple patents and know-how (IP portfolios)



Types of License Compensation in Databases

- These license consideration arrangements may be eliminated (from consideration), adjusted (normalized), or assessed (qualitatively):
 - profit split % of gross profits
 - profit split % of net profits
 - profit split % of product profits
 - % of sublicense revenue/income
 - % of manufacturing costs
 - % of total costs
 - % of exit event consideration
 - % of FMV assigned
 - \$ per volume/weight
- Some of these consideration arrangements may be useful in the application of profit split valuation methods or of cost plus valuation methods
- Some of these consideration arrangements may be converted into a percent of revenue royalty rate



Examples of the Elimination of Royalty Rate Noise

<u>Licensor</u>	<u>Licensee</u>	<u>License Rights</u>	<u>Consideration</u>
Cypress Pharmaceuticals	Pediatrix	Right to distribute Granisol	\$1,000/mo.
Allergan	Nektar Therapeutics	Collaboration agreement to develop Levadex	50% of profits/loss
Arius Pharmaceuticals	Biodelivery Sciences	Rights to BEMA patent and to develop products	\$375,000/quarter
Epicept Corp.	Epicept GmbH	Cooperation agreement to develop Caplene for AML remission treatment	\$2,000/day/employee
Columbia Laboratories	Scientelle	Right to use patent to develop diabetes drug for licensor	150% of development expenses—to licensee
Pharmos Corp.	Reperio Pharmaceuticals	Product development agreement—right to use the patent to develop small molecular drugs	50% of FMV of an exit event



Examples of the Quantitative Adjustment (Normalization) of Royalty Rate Noise

Licensor	Licensee	License Rights	Consideration	Adjustment
Glycomed	Paringenix	Patent rights to develop variations of named products	100% sublicense revenue	8% of revenue [a]
Keryx Biopharma	Torii Pharma	Right to use patent and technology to manufacture products to treat inflammatory cutaneous disorders	15% of mftg cost	7.5% of revenue [b]
Deponed	Solvany Pharma	Right to use patent and technology to develop and manufacture pain medicine delivery device	15% of sales	7.5% of sales [c]
Impax Labs	Medicis Pharma	Right to use patents, know-how, and technology to develop products for treatment of oral acne	25% of gross profit	10% of sales [d]
Columbia Labs	Coventry Pharma	Rights to patents and patent applications to develop small modular immune-pharmaceutical products	50% of pretax profit	7.5% of sales [e]
DVSA Pharma	River's Edge Pharma	Rights to use patents and technology to develop and manufacture products for stated gastro-intestinal disease	\$5,000,000 plus 25% of gross profit	10% of sales [f]

Explanation:

[a] Assume that 100% of sublicense revenue becomes pretax margin; 8% is the pretax margin in this industry.

[b] Manufacturing cost = about 50% of revenue in this industry.

[c] As a rule of thumb, medical devices generally generate about twice the royalty rate as medicines.

[d] Gross profit margin is approximately equal to 40% of sales in this industry.

[e] Pretax margin is approximately 15% of sales in this industry.

[f] Gross profit margin is approximately 40% of sales; the \$5,000,000 upfront payment settles a patent infringement lawsuit between the licensor and the licensee.



Industry Data Sources for Royalty Rate Adjustments

Publicly traded company research sources:

- Bloomberg — Bloomberg is a fully searchable online database that provides financial information on nearly all active and inactive US publicly traded companies and active and inactive international companies. Companies may be searched by industry sectors or by SIC codes. Detailed financial information is available. The information is updated frequently. More information is available at www.bloomberg.com/professional/.
- MergentOnline — MergentOnline is a fully searchable online database that provides financial information on over 15,000 active and inactive US publicly traded companies and approximately 20,000 active and inactive international companies. Companies are listed by SIC codes and by North American Industry Classification System (NAICS) codes. More information is available at www.mergentonline.com.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- S&P Capital IQ – S&P Capital IQ contains detailed financial and textual information on approximately 79,000 publicly traded companies (both domestic and foreign). The information is derived from documents filed with the SEC and similar global securities regulators (as well as proprietary research). The database may be searched by SIC code or by S&P’s industry classifications. Detailed financial information is available. The information is updated frequently. More information is available at www.capitaliq.com.
- Thompson ONE – Thompson ONE is a fully searchable database that provides financial information on approximately 52,000 public companies over 1 million private companies. Companies may be searched by GICS codes or SIC codes. Detailed financial information is available. The information is updated frequently. More information is available at www.thomsonreuters.com.



Industry Data Sources for Royalty Rate Adjustments (cont.)

Industry Financial Research Sources:

- Occupational Safety & Health Administration – The US Department of Labor, Occupational Safety & Health Administration website provides SIC codes. Codes can be searched by keyword, or the SIC code “tree” can be viewed and browsed.
- US Census Bureau – The US Census Bureau NAICS website provides a searchable database of NAICS codes. NAICS codes are a more recent classification system than SIC codes. Therefore, they can be better for newer industries, such as some high-tech industries.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- FirstResearch – FirstResearch is an industry research database that was developed to provide information for sales people. It provides an overview, valuation pricing multiples, growth rates, and information on how to analyze a company in a particular industry. Information is updated quarterly. It is available at www.firstresearch.com.
- IBISWorld – IBISWorld is one of the largest independent publishers of US industry research. Research includes information on major companies in the industry, growth rates, key financial data, and outlook for the industries. The research covers approximately 700 different market segments. Some international reports are also available. Information is updated quarterly for most industries and less frequently for some. It is available at www.ibisworld.com and also through other database aggregators.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- S&P Industry Surveys – S&P Industry Surveys are available on approximately 50 industry sectors. The reports provide global industry information as well as information on the US industries. Major companies are discussed, and detailed information on the recent past and the outlook for the future are provided. A glossary of specialized terms is provided. Also, comparable financial information on major companies in the industry is provided. The information is updated twice a year. These surveys are available from various sources, including S&P NetAdvantage and Alacra.com.
- ABI/Inform – Articles from US and international general interest and trade publications may be searched. This database is available at most libraries and through database aggregators such as Alacra.com.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- Bloomberg Industries – This component of the Bloomberg database provides industry data, interactive charting, and written analysis from a team of industry experts. Contact information for each industry expert is provided so that an analyst can follow up with questions if needed. More information is available at www.bloomberg.com/professional/.
- MarketResearch.com – This database provides access to industry and market research reports from many different sources. It provides information on products, trends, regions, demographics, industries, and companies from its collection of over 700 research publishers. More information is available at www.marketresearch.com.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- S&P Capital IQ – This database provides access to analyst research as well as some market research reports. Capital IQ uses S&P industry classifications. These classifications can be helpful in grouping companies in comparable industries. In addition, comparative ratio information is available. More information is available at www.capitaliq.com.
- Thomson One – This database provides access to analyst research and market research reports. More information is available at www.thomsonreuters.com.
- Westlaw – Articles from US and international general interest and trade publications may be searched. Westlaw also provides access to the Investext analyst research database. More information is available at www.westlaw.com.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- *Almanac of Financial Ratios*, CCH, Inc. – This resource is available in print and e-book formats. The book includes 50 comparative performance indicators and covers all of North America using NAICS data. The information is calculated and derived from the latest available IRS data on nearly 5 million companies. It includes companies in nearly 200 industries. The book is issued annually. More information is available at www.cchgroup.com.
- *Annual Statement Studies: Financial Ratio Benchmarks* and eStatement Studies database, The Risk Management Association – Both the book and the online database contain financial statement ratios and common-size balance sheet and income statement line items, arrayed by asset and sales size. Six different asset and sales size categories are presented. The book and database cover over 700 industries, sorted by NAICS codes. The book is issued annually. More information is available at www.rmahq.org.



Industry Data Sources for Royalty Rate Adjustments (cont.)

- *Ibbotson Cost of Capital*, Morningstar – This annual book contains five separate measures of cost of equity, weighted average cost of capital, statistics on sales and profitability, capitalization, beta, equity valuation multiples, enterprise valuation multiples, financial ratios, equity returns, and capital structure. It is organized by SIC code. Quarterly updates are available online at ccrc.morningstar.com/
- *IRS Corporate Ratios*, Schonfeld & Associates, Inc. – This book includes 76 financial ratios that are based on the most recently available income statement and balance sheet data compiled by the IRS. The data focuses on the comparison of financial ratios for companies with and without net income. The contrast between profitable and unprofitable companies highlights which ratios are critical in the achievement of financial success. The book is issued annually. More information is available at www.saibooks.com.



Examples of Qualitative Assessment of Royalty Rate Noise

Licensor	Licensee	License Rights	Consideration	Term	Analyst's Assessment
Hoffman-La Roche	Meda AB	Rights to patents, trademarks, and all IP, inventory, contracts, manufacturing and sales—asset purchase agreement	10% of sales	6 years	less than 10% of sales [a]
Combinatorix	Fovea Pharma	Collaboration agreement—right to collaborate to develop ophthalmic medicine to treat BOE diseases	4% of sales	10 years	more than 4% of sales [b]
CIBA Vision	Novartis Pharma	Right to use technology to develop a benzoporphyrin derivative mono acid ring for use in cataract surgery	20% of sales	10 years	less than 20% of sales [c]
Coventry Pharma	Watson Pharma	Right to use patent, trademark, copyrights, regulatory filings, and promotional materials to develop Progesterone products	10% of sales	until last IP expires	less than 10% of sales [d]
PDL Biopharma	Alexion Pharma	Right to use PDL antibody patent family in the development and manufacture of other licensed products	4% of sales	term of other licenses	more than 4% of sales [e]

Footnotes:

[a] Licensee is paying for a going-concern business.

[b] Both licensor and licensee have to contribute to the development of any new drug.

[c] Medical devices extract higher royalty rates; also gives licensee the right to buy materials from the licensor at cost.

[d] Includes multiple IP and the right to operate a business.

[e] Patent can only be used with other licensed products, that also generate license royalty income to the licensor.



Examples of Selected CUT Royalty Rate Data for Psi Analysis

Licensor	Licensee	License Rights	Term	Consideration
Cominatrix	Alpha Plan	Right to use patent and clinical research to adopt Prednisporin to treat glaucoma	6 years	8% of sales
Cosmo Pharma	Santorus	Right to use patents and know-how to develop products containing Budesonide to treat ulcerative colitis	6 years	7% of sales
Eli Lilly	United Therapeutics	Right to use technology to develop and commercialize prescription product for treatment of pulmonary hypertension	20 years	6% of sales [a]
Baxter International	Eleisin Pharma	Right to patent and technology to improve Glufosfamide related to treatment of cancer	9 years	8% of sales
Auxilium Pharma	Biospecifics	Right to use BTC patents in development of next generation of products to treat Peyronie's Disease	8 years	8.5% of sales

Footnote:

[a] Royalty rate may be low due to long license period.



Psi Patent Royalty Rate Conclusion

- What is the market-derived royalty rate for a use license of the psi compound patent?
- The analyst eliminated royalty rate data that did not present meaningful license consideration
- The analyst adjusted royalty rate data to indicate an adjusted range of royalty rates of 7.5% to 10% of sales
 - mean royalty rate – 8.4%
 - median royalty rate – 8%
 - mode royalty rate – 7.5%



Psi Patent Royalty Rate Conclusion (cont.)

- The analyst assessed royalty rate data that indicated a greater than/less than royalty rate range as follows:
 - royalty rate greater than 4%
 - royalty rate less than 20%
 - modes – greater than 4%, less than 10%
- The analyst selected CUT royalty rate data that indicated a range of 6% to 8.5% of sales and:
 - royalty rate mean – 7.5%
 - royalty rate median 8%
 - royalty rate mode 8%
- Based on these empirical data, the analyst select a royalty rate of 8% of sales for the psi patent



Market Approach – Relief from Royalty Method Example

Beta Company
Psi Compound Patent Valuation
Market Approach - Relief from Royalty Method
As of January 1, 2015
(in \$ millions)

Psi Patent Valuation Analysis: [a]	Projection Period								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Psi product revenue expected growth rate [b]	10%	10%	10%	0%	0%	0%	-12%	-12%	-12%
Psi revenue amount (year 0 revenue = 400)	440	484	532	532	532	532	469	412	363
Selected patent license royalty rate	<u>8%</u>	<u>8%</u>	<u>8%</u>	<u>8%</u>	<u>8%</u>	<u>8%</u>	<u>8%</u>	<u>8%</u>	<u>8%</u>
Projected “relief from royalty” license expense (rounded)	35	39	43	43	43	43	38	33	29
Projected patent maintenance expense (year 0 expense = 10) [c]	<u>10</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>12</u>	<u>12</u>	<u>12</u>	<u>13</u>	<u>13</u>
Projected net “relief from royalty” license expense (rounded)	29	28	32	32	31	31	26	20	16
Present value discount factor (at 20%, mid-year convention)	0.91	0.76	0.63	0.53	0.44	0.37	0.30	0.25	0.21
Present value of “relief from royalty” net license expense	<u>23</u>	21	20	17	14	11	8	5	3
Total present value or “relief from royalty” net license expense	<u>122</u>								
Fair market value of the psi compound patent (rounded)	<u>120</u>								



Market Approach – Relief from Royalty Method Example (cont.)

Notes:

- [a] Expected RUL of the psi patent is 9 years, based on management's projection of the psi product economic life. Management is currently developing a replacement product.
- [b] Analyst derived the projected revenue growth/decline rates (in conjunction with Beta management) based on an analysis of similar drug product revenue growth/decline rates during the last half of their patent life cycles.
- [c] Analyst derived (in conjunction with Beta management) an estimate of the psi product legal, R&D, marketing, and other maintenance expenses.



Patent Income Approach Valuation Components

- Income approach methods
 - Yield capitalization involves uneven income projections over a finite projection period
 - Direct capitalization involves an annual constant change rate income projection over either a finite period or a perpetuity period
 - Typical patent income measures include:
 - incremental/differential income (with vs. without the invention)
 - excess income/residual income (business enterprise income less capital charge on all contributory assets)
 - profit split (percentage of business enterprise income assigned to the subject patent, based on a “functional analysis”)
 - residual profit split (excess income “split” between two final intangible assets)



Common Patent Income Levels

- EBITDA
- EBIT
- NOI (EBITDA less income taxes)
- Net income
- Net cash flow
- Residual income (after a CAC)
- Contribution income (for economic damages analysis)



Patent Income Approach Valuation Considerations

- Match the selected discount/capitalization rate with the selected income measure
- Match the selected discount/capitalization rate with the subject patent risk
- Consider the state of the competition in the owner/operator industry
- Consider all subsequent (to the valuation date) capx, R&D expenses, marketing expenditures, etc.



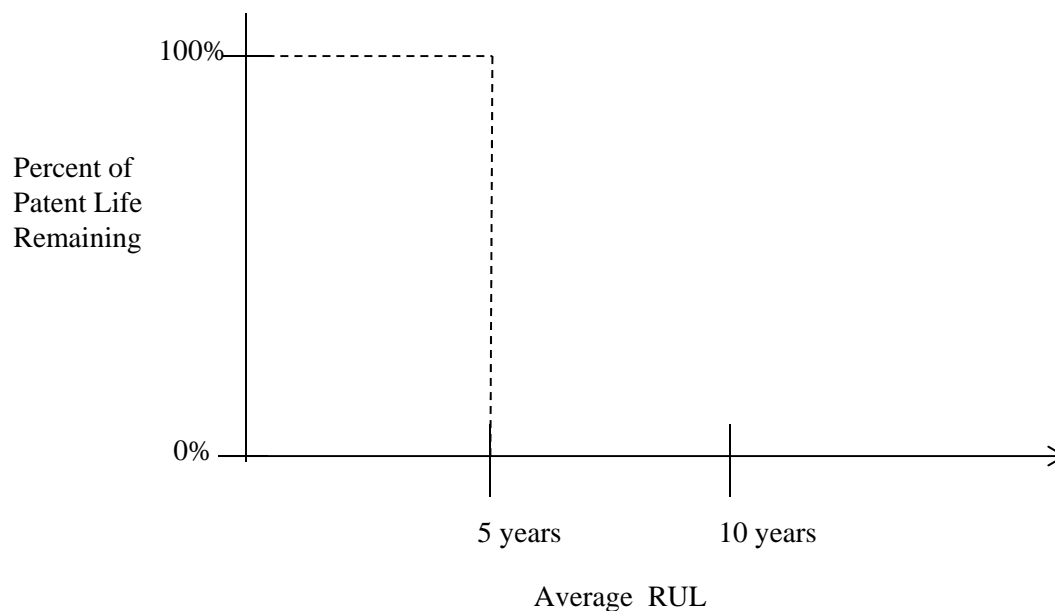
Patent Income Approach Valuation Considerations (cont.)

- Analyze only the income that is directly related to the subject patent
- Income projection should consider patent maintenance and protection costs
- Present value the projected income over either:
 - the patent average RUL
 - down the patent RUL decay curve



Patent Income Approach Valuation Considerations (cont.)

**Present Value of Income Projection
Over the Average Remaining Useful Life**

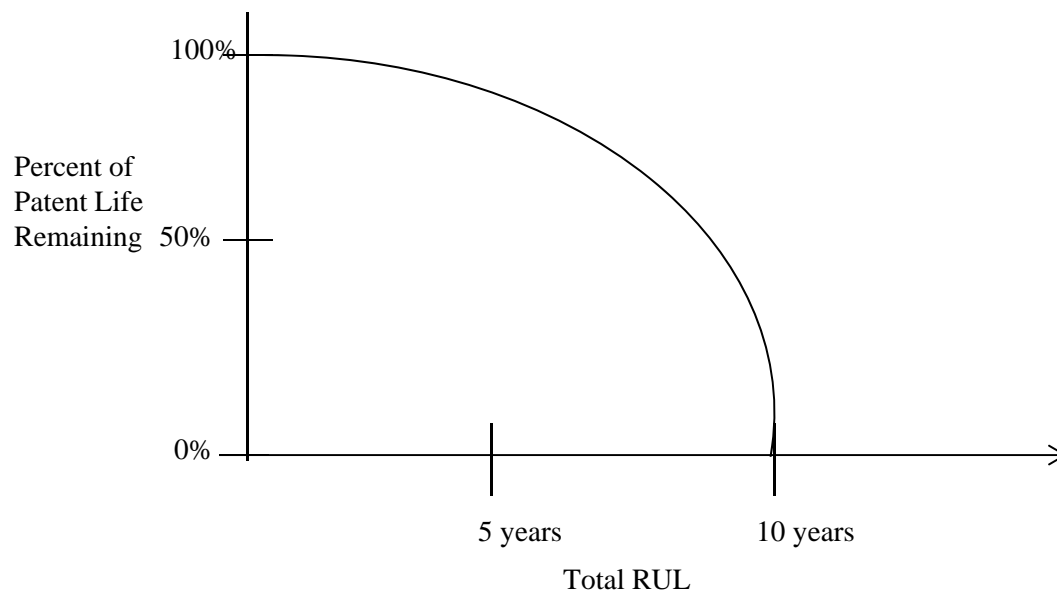


Assumes: Patent Total Remaining Life of 10 Years
Patent Average Remaining Useful Life of 5 Years



Patent Income Approach Valuation Considerations (cont.)

Present Value of Income Projection Down the Total Remaining Useful Life Curve



Assumes: Patent Total Remaining Life of 10 Years
Patent Average Remaining Useful Life of 5 Years
Consider the Shape of the Patent Life Cycle and the Patent RUL



Income Approach – Multiperiod Excess Earnings Method Example

Gamma Company
 Chi Compound Patent Valuation
 Income Approach — Multiperiod Excess Income Method
 As of January 1, 2015

Valuation of Chi Compound Patent	Notes	Pro Forma Years									
		12/31/11	12/30/12	12/30/13	12/30/14	12/31/15	12/30/16	12/30/17	12/30/18	12/31/19	12/30/20
	[a]	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Revenue attributable to chi product	[b]	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	[c]	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	[d]	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%
Less: Depreciation/amortization expense	[e]	793,018	552,967	375,423	248,423	160,263	123,402	95,020	73,165	56,337	43,380
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 percent	[f]	<u>288,640</u>	<u>219,390</u>	<u>162,273</u>	<u>118,092</u>	<u>84,463</u>	<u>65,036</u>	<u>50,078</u>	<u>38,560</u>	<u>29,691</u>	<u>22,862</u>
Net income		491,469	373,557	276,302	201,075	143,815	110,738	85,268	65,656	50,556	38,928
Net income 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: Contributory asset charges:											
Working capital capital charge	[g]	27,530	20,053	14,245	9,932	6,799	5,236	4,031	3,104	2,390	1,840
Tangible assets capital charge	[g]	(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]	<u>(164,756)</u>	<u>(123,965)</u>	<u>(91,524)</u>	<u>(66,472)</u>	<u>(47,625)</u>	<u>(36,671)</u>	<u>(28,237)</u>	<u>(21,742)</u>	<u>(16,742)</u>	<u>(12,891)</u>
Equals: patent economic 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%		<u>0.9492</u>	<u>0.8551</u>	<u>0.7704</u>	<u>0.6940</u>	<u>0.6252</u>	<u>0.5633</u>	<u>0.5075</u>	<u>0.4572</u>	<u>0.4119</u>	<u>0.3710</u>
Present value of patent excess income		<u>307,767</u>	<u>190,823</u>	<u>114,679</u>	<u>66,917</u>	<u>37,834</u>	<u>26,249</u>	<u>18,209</u>	<u>12,631</u>	<u>8,762</u>	<u>6,077</u>
Present value of patent excess income		<u>789,949</u>									
Fair market value of chi patent (rounded)		<u>790,000</u>									



Income Approach – Multiperiod Excess Earnings Method Example (cont.)

Footnotes:

- [a] RUL on the chi compound patent is 10 years. Gamma management is planning to replace the chi product with a new product as soon as it goes “off patent.”
- [b] Management provided a revenue projection for the chi product for the next five years. That projection indicates the expected impact of noninfringing competitive pharmaceutical products.
- [c] The analyst quantified the 23% revenue decay rate for similar drugs during the last five years of their patent life cycles.
- [d] The chi product EBITDA margin has been fairly constant at around 44% during the first half of the patent life cycle.
- [e] Depreciation expense is allocated to all Gamma products based on their relative revenue.
- [f] Income tax rate at the marginal Gamma tax rate.
- [g] Capital charge is based on a fair rate of return multiplied by the:
 - FMV of product line NWC
 - FMV of product line RE and TPP
 - FMV of product line routine intangible assets (other than the chi patent)
- [h] Midyear discounting convention.



Summary and Conclusion

- There are a lot of noise in patent license royalty rate raw data
- Analysts can effectively use these empirical data to perform patent valuations
- Analysts may use the “eliminate, adjust, and assess” procedures to reach a reasonable range of patent royalty rates—and a final, supportable patent royalty rate conclusion
- Analysts should not use the Goldilocks procedure:
 - select a predetermined royalty rate that is “just right”
 - then eliminate, adjust, and assess the data to justify the predetermined “just right” royalty rate



Summary and Conclusion (cont.)

- Analysts should be prepared to explain all selections, rejections, or adjustments of available royalty rate data
- If the license market for the subject patent is efficient, then the analyst should be able to modulate the noise in the royalty rate data—and to reach a reasonable range of royalty rates and a supportable royalty rate conclusion



Summary and Conclusion (cont.)

- Types of intellectual property
- Reasons to analyze intellectual property
- Types of patents
- Patent-related intangible assets
- Generally accepted valuation approaches and methods
- Cost approach patent valuation example
- Market approach patent valuation example
- Income approach patent valuation example
- Questions and discussion