IP Valuation Committee
June 2018
Why do we focus on intangible (IP) assets?

• Intangible value of enterprises
  • Recognition of intangible assets as part of Company value
  • Increasing trend of % intangible value vs. total value
  • A recognized need to increase market actors’ confidence in Intangible Value
  • Intangible assets interact: complementarity of assets

• Intellectual Property assets
  • Intangible in essence
  • In interaction with other assets (tangible and intangible – e.g. human capital)
  • Protected by Rights and/or secret
  • Forward-looking: what usage do they allow? How and why are they bearing a value now or are they going to bear a value later?
Why value intangibles?
Because (some) economic value is needed for a wide spectrum of usages

• Enterprise/ Management-Oriented
  • R&D cost decision/allocation
  • Other strategic decision-making / cost allocations /...

• Transfer-oriented
  • Intra-Group Transfer Pricing
  • Licensing /Sale-purchase of technologies, trademarks
  • R&D partnerships, ...

• Conflict-oriented: evaluation of damages

• Finance and accounting-oriented
  • Mergers & Acquisitions: Purchase Price Allocations
  • Income or market- view (e.g. debt financing)
LES International IP VALUATION COMMITTEE

• Our Objectives
  • Foster a common culture and understanding of IP Valuation, especially the economic perspective
  • Prepare us to be able to use best judgement when choosing/applying/being provided with valuations
  • Detect and promote complimentary and/or new approaches where needed

• Our general roadmap
  • Foster communication between local IPV committees
  • Share and educate: share and update Toolboxes, Databases and Literature Repositories with LES members
  • Methods and standards: share best practices, address qualitative and quantitative approaches as complimentary
WHAT IS THE VALUE OF AN INTANGIBLE ASSET?

• It is AN OPINION (*):
  • At a given point in time
  • Under given circumstances
  • In many ways similar to a legal opinion, but considering economic terms

• It is influenced and complicated by a huge spectrum of factors:
  • Need to evaluate the perimeter of IP Assets encompassed in the Opinion (patents, trademarks, know-how, designs, copyrights…)
  • Need to state the context in which the Opinion is requested: the way one uses an invention strongly depends on his own abilities
  • Need to find comparables, knowing that no two IP assets are equal: comparisons are at best judgements
  • Convincing forward-looking assumptions: the future is uncertain...

• Thus it contains an intrinsic uncertainty.

Methodologies: Past, Present, Future-Rooted

HISTORICAL COSTS

DCF

MULTIPLES

REAL OPTIONS

Past

Present

Future

Patent 1

Patent 2

Patent 3

Patent 4

Patent 5

5

4

4

3

 oportunistic value

-5

-4

-4

-3

-2

+16

+16

=2,9

10% discounting rate

scenario 1

scenario n

Initial costs

Dvpt

Production

Sales

2018

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Cost Approach

Approximates the IP/Technology by the costs of replacement/creation of equivalent IP/Technology

- Generally R&D costs and patent filing related costs

Correlation between costs and value is generally highly questionnable

- Wholly disregards the uniqueness of the IP/Technology
- Does not reflect the evolution of the environment: time-lag effects
- Does not reflect earning power of IP/Technology and ultimate market share

Utilized whenever replacement is possible, and if not generally useful in case there is no other available data

- More adapted to Early Stage development IP/Technologies
Market Approach

Parallels the subject intangible asset with comparable or similar intangible assets that have been sold or listed for sale

- Difficulty lies in comparability
- More adapted for mature and fully developed technologies

Multiple Index approaches rationalize comparability

- Patent family size
- Citations analysis, technical coverage
- Geographical coverage, legal strength
- Market attractiveness

Comparisons are at best as good as the transactions database is....
Revenue-based Approaches

Identifies the value of the assets with that of the future revenues derived from it

- Means a reasonable business plan exists
- Thus adapted for technologies close to market

The most common approaches are based on Discounted Cash Flows

- Implies estimating the **probable** incremental cash provided by the asset
  - Royalty, Incremental margins (Sales increase ad/or cost savings)
  - Implies to assess the part of revenues strictly linked to the IP/technology/IP

Real Options approaches integrate explicitly probabilities and revenues in a dynamic way
Discounted Cash Flow – The basics of NPV

- NPV reflects the way you consider cash flows and allows to choose between alternatives such as: take 100€ today or wait 1 year to expect 115€?

- The main parameters impacting NPV are:
  - The expected useful life of the asset
  - The variation of yearly cash flows (e.g. royalties), namely their growth rate
  - The discount rate, capturing both future risks and value of money

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Impact on NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful life</td>
<td>↦</td>
</tr>
<tr>
<td>Royalty Rate</td>
<td>↦</td>
</tr>
<tr>
<td>Growth rate</td>
<td>↦</td>
</tr>
<tr>
<td>Discount rate</td>
<td>↦</td>
</tr>
</tbody>
</table>
Orders of magnitude and variability for a perpetuity (infinite useful life)

<table>
<thead>
<tr>
<th>Sales</th>
<th>100 M€/y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount Rate</td>
<td>9%</td>
</tr>
<tr>
<td>Royalty Rate</td>
<td>4,0%</td>
</tr>
<tr>
<td></td>
<td>5,0%</td>
</tr>
<tr>
<td></td>
<td>6,0%</td>
</tr>
<tr>
<td>1% DR impact</td>
<td>-13%</td>
</tr>
<tr>
<td>1% Royalty impact</td>
<td>22%</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>2,0%</td>
</tr>
<tr>
<td></td>
<td>3,0%</td>
</tr>
<tr>
<td></td>
<td>4,0%</td>
</tr>
<tr>
<td>1% DR impact</td>
<td>-12%</td>
</tr>
<tr>
<td>1% Growth impact</td>
<td>18%</td>
</tr>
</tbody>
</table>

Only considering ± 1% on Discount Rate, Royalty Rate or Growth Rate implies >±15M€ uncertainty on the 71M€ central value:
- One has to live with uncertainty
- The valuators’ expertise to reduces this uncertainty by defining the right parameters, following a rigorous and replicable process
Royalty Rates

- Most generally: benchmark from databases – a specialist job
- Many issues
  - Comparability of benchmarks
    - Read agreements
    - Rejection process
  - Stacking issues for complementary technologies
- Need to be commensurate with business performance
  - 20-30% of EBIT rule
- No standard

<table>
<thead>
<tr>
<th>Royalty Rate Industry Summary 2016</th>
<th>Average</th>
<th>Median</th>
<th>1st Quartile</th>
<th>3rd Quartile</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>4.9%</td>
<td>4.5%</td>
<td>2.5%</td>
<td>5.5%</td>
<td>40.0%</td>
<td>0.1%</td>
<td>181</td>
</tr>
<tr>
<td>Internet</td>
<td>16.6%</td>
<td>12.5%</td>
<td>5.0%</td>
<td>24.1%</td>
<td>80.0%</td>
<td>0.3%</td>
<td>408</td>
</tr>
<tr>
<td>Telecom (excluding Media)</td>
<td>6.4%</td>
<td>4.5%</td>
<td>2.3%</td>
<td>6.5%</td>
<td>50.0%</td>
<td>0.0%</td>
<td>187</td>
</tr>
<tr>
<td>Consumer Goods, Retail &amp; Leisure</td>
<td>5.9%</td>
<td>5.0%</td>
<td>2.8%</td>
<td>7.0%</td>
<td>40.0%</td>
<td>0.0%</td>
<td>313</td>
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<tr>
<td>Media &amp; Entertainment</td>
<td>9.8%</td>
<td>5.5%</td>
<td>2.8%</td>
<td>10.0%</td>
<td>80.0%</td>
<td>0.1%</td>
<td>85</td>
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<tr>
<td>Food</td>
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<td>4.0%</td>
<td>2.5%</td>
<td>5.5%</td>
<td>70.0%</td>
<td>0.3%</td>
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<tr>
<td>Medical &amp; Health Products</td>
<td>5.9%</td>
<td>4.5%</td>
<td>2.5%</td>
<td>6.8%</td>
<td>80.0%</td>
<td>0.0%</td>
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<tr>
<td>Pharmaceuticals &amp; Biotechnology</td>
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<td>2.5%</td>
<td>9.0%</td>
<td>90.0%</td>
<td>0.0%</td>
<td>2,655</td>
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<tr>
<td>Energy &amp; Environment</td>
<td>5.9%</td>
<td>4.5%</td>
<td>2.5%</td>
<td>7.0%</td>
<td>75.0%</td>
<td>0.1%</td>
<td>495</td>
</tr>
<tr>
<td>Machines &amp; Tools</td>
<td>5.9%</td>
<td>4.3%</td>
<td>2.8%</td>
<td>6.3%</td>
<td>50.0%</td>
<td>0.5%</td>
<td>141</td>
</tr>
<tr>
<td>Automotive</td>
<td>5.1%</td>
<td>4.3%</td>
<td>2.5%</td>
<td>6.0%</td>
<td>30.0%</td>
<td>0.5%</td>
<td>142</td>
</tr>
<tr>
<td>Electrical &amp; Electronics</td>
<td>4.7%</td>
<td>4.1%</td>
<td>2.5%</td>
<td>5.5%</td>
<td>25.0%</td>
<td>0.1%</td>
<td>220</td>
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<tr>
<td>Semiconductors</td>
<td>5.0%</td>
<td>3.9%</td>
<td>1.9%</td>
<td>5.5%</td>
<td>50.0%</td>
<td>0.0%</td>
<td>144</td>
</tr>
<tr>
<td>Computers &amp; Office Equipment</td>
<td>5.4%</td>
<td>4.0%</td>
<td>2.3%</td>
<td>6.8%</td>
<td>30.0%</td>
<td>0.2%</td>
<td>133</td>
</tr>
<tr>
<td>Software</td>
<td>14.0%</td>
<td>9.0%</td>
<td>4.5%</td>
<td>21.0%</td>
<td>77.0%</td>
<td>0.0%</td>
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<tr>
<td>Summary</td>
<td>7.8%</td>
<td>5.0%</td>
<td>90.0%</td>
<td>0.0%</td>
<td>6,667</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discount Rates – KEY ISSUE

- Discount rates must capture the risk profiles of cash flows
  - Databases provide estimates
  - No real consensus

- Some models exist: example Capital Asset Pricing Model (CAPM)
  - Assumes linear relationship between market behaviour and asset risk
  - Discount Rate = Low risk D.R + Beta x Risk Premium
  - Beta = covariance of market and cash flow volatility

- There is room for new theories; LESI IPV Committee will be part of the effort
Let us be provocative – simulating a license value

<table>
<thead>
<tr>
<th></th>
<th>Base Case</th>
<th>Simulation</th>
<th>Min</th>
<th>Peek</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales first year</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>yoy Growth rate</td>
<td>3%</td>
<td>4%</td>
<td>1%</td>
<td>3%</td>
<td>10%</td>
</tr>
<tr>
<td>Royalty Rate vs. Net Sales</td>
<td>5%</td>
<td>6%</td>
<td>3%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Duration</td>
<td>10</td>
<td>11</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Peers WACC</td>
<td>10%</td>
<td>10%</td>
<td>8%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Technology Risk Premium</td>
<td>1%</td>
<td>3%</td>
<td>0,5%</td>
<td>1,0%</td>
<td>5,0%</td>
</tr>
</tbody>
</table>

Simulation of 5000 Scenarii (« Monte Carlo »(*)
License Value lies in a range 15M€ - 50 M€

(*): using MS Excel plug-ins, create 5000 scenarii choosing randomly parameters in the given variation range
The value is that of the right but not the obligation to exercise an option

- The RO Approach allows the recognition of flexibility and of multiple outcomes
- A vision of the possible outcomes is required

Based on Black and Scholes or a lattice model in discrete time.

- Implies that the decision to invest is reversible
- Rejects determinism but a diffusion processes must be specified
- Also relies on a business plan and on DCF as proxy of the underlying asset value, i.e. requires discounting rates

ROR allows dynamic projections and multiple scenarios, and reduces the power of assumptions
REAL OPTIONS APPROACH
TIME IS ON YOUR SIDE – ALTERNATIVE PATHS

Should I spend this…..?
… to know if I shall earn this….
And those ?
… or that ?

TIME + CHOICE = VALUE PREMIUM

Decision
Uncertainty

Outcome 1
Outcome 2
Outcome 3
Outcome 4
Outcome 5
Outcome 6
Outcome 7
REAL OPTIONS APPROACH
Time reduces uncertainty – One value, several paths

Extended project value
= NPV+ flexibility (option)
REAL OPTIONS APPROACH

One size doesn’t fit all: a quadrant approach

I
NPV/ PP

II
Simulation &
/or Vanilla
Option

III
Scenario +
Sensitivity =
Simulation

IV
Complex
Option

I
Very certain

II
Certain

III
Certain

IV
Very uncertain

Distributions
simple
Environment
Cash Flows
complex

SRATEGICAL APPROACH

METHODOLOGICAL APPROACH

2018
LES International - IP Valuation Committee
IP Valuation Committee – Our Path Forward

• Our organization:
  • Operational Committee: steers and animates the WW IPV Committee
    • A. Gorius – France (Chair), Martha-Laura Lopez – Mexico (Co-Chair)
    • Vice-Chairs: A. Chaouat – France, P. Ewbank – Belgium, K. Gala (Asia Pacific), A. Nestler – Germany, A. Vestita – Italy
  • Worldwide LESI IPV Committee: do not hesitate to join us

• Our Roadmap
  • Priorities 2018-2019:
    • Education and communication around methods; provide access to tools and literature references; webminars with recognized specialists
    • Provide access to specific licenses/royalty: Case studies
  • Deliverables 2018-2019
    • ToolBox – in coordination with local LES Committees
    • Best Practices – publication in Les Nouvelles
    • Case studies / specialized webminars