

Approaches, Tools, & Methods of Valuation



Workshop
V-1



LES Annual Meeting
San Francisco CA
October 19, 2009

CRA Charles River
Associates

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Terms of Art

- ▶ **Technology:** "is a broad concept that deals with ...usage and knowledge of tools & crafts, and how it affects ...[one's] ability to control and adapt ...[one's] environment. ...a consequence of science & engineering Technology is a term with origin in the Greek "technologia"..... However, a strict definition is elusive..." www.en.wikipedia.org/wiki/Technology
- ▶ **Technology / Licensing A-M-T:**
Approaches - Methods - Tools [Principles]
- ▶ **Technology / Licensing D-V-D ©:**
Discovery (of an Opportunity) - Valuation - Dealmaking
- ▶ **TR R^hA DE ©:** Technology-Rights, Risk, Art, Deal-Economics
- ▶ **k, RAHR:** discount rate; Risk Adjusted Hurdle Rate

Disclaimers

- The purpose of this presentation is to provide a general background for **educational purposes** and provide context for discussion of Approaches - Methods - Tools [Principles] useful for Technology Licensing.
- This presentation expresses **my own views**, which do not necessarily represent the views of Charles River Associates, and are not even my final views on the matters addressed.
- The context of this presentation is "**opportunity licensing**" as distinct from litigation ("enforcement licensing").

Roadmap of Presentation from 2009 Valuation & Dealmaking book*

| | | A-M-T | |
|-----------------|---|-------------------------|---|
| | | A: Approaches | M: Methods |
| Licensing D-V-D | D | Discovery | The Box NPV v. Risk |
| | V | Valuation TR R* A DE | <ol style="list-style-type: none"> 1. Industry Standards 2. Rating/Ranking 3. Rules of Thumb 4. Discounted Cash Flow (NPV) 5. Monte Carlo; Real Options 6. Auctions |
| | D | Dealmaking | Pricing, Structures, Term Sheets Dealmaking-Process Plan B |
| | | | T: Tools |
| | | | Rating/Ranking DCF |
| | | | > Rating/Ranking |
| | | | > Rules of Thumb |
| | | | > Discounted Cash |
| | | | > Risk Assessment |
| | | | Rating/Ranking DCF/NPV Monte Carlo Real Options |

*Razgalla's
Valuation & Dealmaking of Technology-Based IP,
John Wiley & Sons, 600 pages.



1st "D" of D-V-D... Opportunity **Discovery**

- The "so what?" question...the test of significance:

- Lithuanian: **ta!**, **ka!**?
- Chicago Alderman: **WIIFM?**
- Classical Greek: **en emoi?**
- **Twitter: WC?** (to which the reply could easily be: **WE**)

| A Really Big Deal | Not So Big a Deal |
|--|--|
| Major | Minor |
| Breakthrough | Improvement |
| Foundational | Enhancement |
| Transformative | Incremental |
| Revolutionary | Routine |
| Next Generation (e.g., G3) | Current Generation (e.g., G2) |
| Web "N + 1" (e.g., 2.0) | Web N (e.g., 1.0) |
| Next Wave | Same wave |
| Quantum Leap [®] | Next Step |
| Great Leap (forward) | Next Step (up) |
| Paradigm Shift [®] | Same declensions, conjugations |
| Game Changer | Same old game, but some new pieces |
| Tomorrow | Coming later this afternoon |
| Sea Change | Same old sea |
| The Pirate Ship that Sailed into the Yacht Club Harbor | Little Toot, "the little tugboat that could..." by just trying harder |

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The **Box**: I made 10 sales calls today; coulda made 15...

1st, rough draft of the **Internal Term Sheet**,
an "Opportunity **Catechism**"

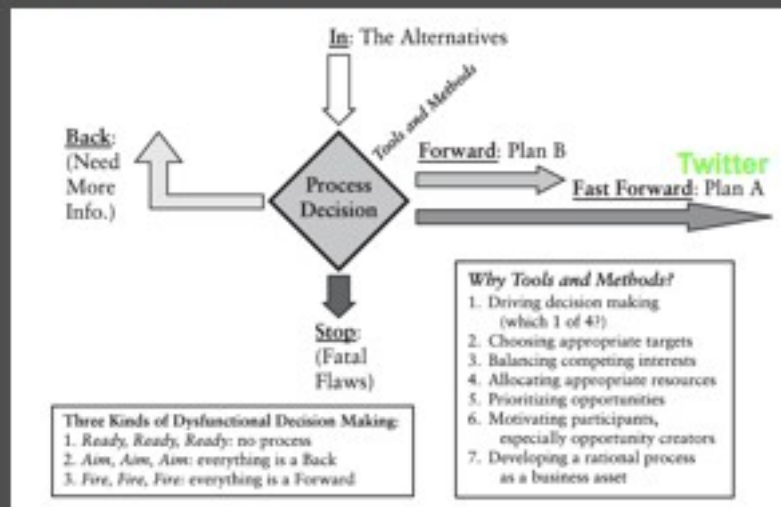
- What creates net value? (contra W/E)
- What aids / creates 'deal doability'?

- What is the roadmap / taxonomy?
- TAPS Chart? Value bullseye? Hair & a spare?

- **WC? Why?**

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Think Olympics



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“V” of D-V-D... Opportunity Valuation

- Taking a prioritized opportunity and creating dealmaking readiness, structuring & quantifying in a flexible / adaptable / persuasive form, **The Price** possibilities.

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| | | | Rating/Ranking DCF/NPV Monte Carlo Real Options |

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Method 1: Use of "Industry Standards"

Data Sources

1. Surveys
2. Proposed Norms, Paradigms
3. Published Court Cases
4. Shopped Terms Sheets
5. Price Lists
6. Published Agreements
7. "News"
8. Seat at the table/lifetime learning
9. Proprietary Databases, Reports
10. Consultants

However

1. "Box?" Bias?
2. "Box?" Comp?
3. Litigation specific
4. Asking? Comp?
5. Actual payment?
6. Comp? Timing?
7. Detail? True?
8. Applicable? Jdgmnt?
9. "Box?" Comp?
10. Experience?

Method 2: "Rating / Ranking"

**Bond (Debt)
Example:
Classification,
based upon
"business" criteria,
to 'scale' risk.**

| Maturity | AAA | | A | | BBB | | Description |
|----------|-----------|------------|-----------|------------|-----------|------------|---|
| | Long term | Short term | Long term | Short term | Long term | Short term | |
| AAA | AAA | AAA | AAA | AAA | AAA | AAA | Prime |
| AA1 | AA+ | AA- | AA+ | AA- | AA+ | AA- | |
| AA2 | AA | AA | AA | AA | AA | AA | |
| AA3 | AA- | AA- | AA- | AA- | AA- | AA- | High Grade |
| A1 | A+ | A+ | A+ | A+ | A+ | A+ | |
| A2 | A | A | A | A | A | A | Upper Medium Grade |
| A3 | A- | A- | A- | A- | A- | A- | |
| A4 | A- | A- | A- | A- | A- | A- | Lower Medium Grade |
| BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | |
| BBB | BBB | BBB | BBB | BBB | BBB | BBB | |
| BBB- | BBB- | BBB- | BBB- | BBB- | BBB- | BBB- | Non Investment Grade Speculative |
| BB+ | BB+ | BB+ | BB+ | BB+ | BB+ | BB+ | |
| BB | BB | BB | BB | BB | BB | BB | |
| BB- | BB- | BB- | BB- | BB- | BB- | BB- | Single Speculative |
| B+ | B+ | B+ | B+ | B+ | B+ | B+ | |
| B | B | B | B | B | B | B | |
| B- | B- | B- | B- | B- | B- | B- | Substantial risk |
| CCC+ | CCC+ | CCC+ | CCC+ | CCC+ | CCC+ | CCC+ | |
| CCC | CCC | CCC | CCC | CCC | CCC | CCC | |
| CCC- | CCC- | CCC- | CCC- | CCC- | CCC- | CCC- | In default, with little prospect for recovery |
| D | D | D | D | D | D | D | |
| D | D | D | D | D | D | D | |
| D | D | D | D | D | D | D | In default |
| D | D | D | D | D | D | D | |

Technology Rating /Ranking: Weighted Likert

EXHIBIT 5.12 Example Use of Rating/Ranking Method

| | Weighting (1-3) | Score (1-5) | Weighted Score |
|-------------------------|-----------------|-------------|------------------|
| 1. Market Size | 2 | 3 | 6 |
| 2. Product Margins | 3 | 5 | 15 |
| 3. IP Strength | 2 | 4 | 8 |
| 4. IP Breadth | 3 | 3 | 9 |
| 5. Stage of Development | 3 | 2 | 6 |
| 6. Market Environment | 1 | 3 | 3 |
| TOTALS | - | - | 47 [1.12] |

Example Alternative Scales:

- ▶ Multiplied Likert
- ▶ 10 Point
- ▶ 4 Color

Additional Uses:

- ▶ Choosing best opp.s
- ▶ Internal decision-making
- ▶ Deal structuring
- ▶ Preparing for marketing & negotiation

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Method 3: "Rules of Thumb"

Approach: **Discovery**
finding/making a big pie

*"More and more of our imports come from overseas." (Laughter.) Now, most people would say, in speaking of the economy, we ought to make the pie bigger. I, however, am on record saying, "We ought to make the pie higher." (Laughter.) It is a very complicated economic point I was making there. (Laughter.) But believe me, what this country needs is **fatter pie**. (Laughter and applause.)"*

President George W Bush, Radio-Television Correspondents Association 57th Annual Dinner

Approach: **Valuation** (Method 3)
fairly/reasonably dividing the pie

What's "The Pie?"

1. Costs saved
2. New EBIT (pre-tax operating profit)



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2 Key Relative Contribution Issues

(using 25% as an example 'rule')

1. Stacking: The Buyer needs 4 licenses to build X.
Each Seller wants 'their' 25%.



2. Stage of Development: For a "Porsche Box," what do I get?



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Method 4: "DCF Method [NPV = f(RAHR)]"

Calculate,

by fore-casting,

the Net Present Value (NPV),

of all the future discounted cash flows (DCF),

out & in,

over the opportunity horizon,

on a risk adjusted (RAHR) basis.

The 3 inputs
to compute
each DCF
value, and
thence the
NPV:

- Magnitude
- Timing
- Risk
(of Cash flows)

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Enhancements to the DCF Method

- **Use of Scenarios**

Discrete coherent conceivable futures:

High, Medium, Low, ...

(Complicates RAHR judgment)

- **Use of Decision Analytics ('Trees')**

Avoids using high RAHR values

Prevents minimal/negative NPV for what is instinctively a worthwhile opportunity

Requires assigning probabilities of all possible outcomes

- **However...**

Scenario Coherence? Completeness?

Basis for assigned probabilities?

Method 5: Monte Carlo & Real Options

Theory

Monte Carlo is founded on (A) powerful mathematical tools operating on a DCF spreadsheet which (B) use "probability [or distribution] functions" instead of single values for any assumption and, thereby, (C) creates a probability distribution of predicted NPV outcomes, which enhances (D) the opportunity for dealmaking judgment (*FRO-knee-sis*).

Application

1. Develop a DCF "baseline" model, using "Cost of Capital" (**WACC**) discounting
2. Construct probability distributions for model's variables
3. Grok the Fullness, including the use of "Tornado Diagrams"
4. Refine/test the assumptions, especially with respect to scenarios.
5. Exercise judgment, recognizing (A) GIGO & (B) Micrometric Folly...

Method 6: Auctions

Auctions date from antiquity.

In principle, they provide the seller two distinct benefits: price determination (via a fair market) AND liquidity / deal-consummation (via a willing buyer).

The "open outcry" format, made famous in scenes of an exchange floor (for equities, commodities, or options on the same), and hilarious in the movie "Trading Place" (Eddie Murphy), which final scenes can be seen on YouTube.com. However technology "auctions" take place in various contexts, only some of which even resemble the open outcry system.

When auctions make sense, and are done well, they can, in effect, be the exact "market method" of valuation.

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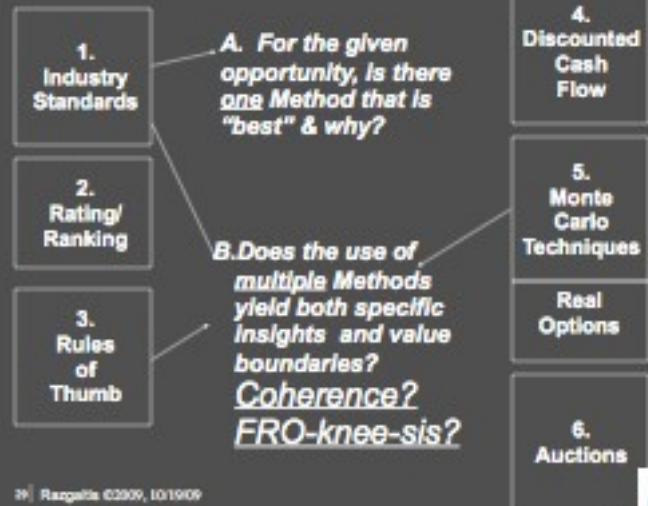
Types of Auctions

- Online Listing
- Bankruptcy Court Managed
- Public "open outcry"
- Mass Mailing
- Strategic Direct
- Structured Private

However (Auction-Caution)

- "Box?" Did we have the pie 'too short'?
- True "Market" Value?
- Dealmaking Failure?

Approach: **Valuation. 6 Methods???**
Epistemic Supremacy, or Coherence? Judgment?



3rd Approach: D-V-D... Dealmaking

- The seller offers it's "Box," and seeks a "Wheelbarrow" (of compensation) from the buyer. Deal Structure is about the shape / form of that Wheelbarrow.
- Structure is defined by the Term Sheet, though an Internal Term Sheet may have multiple acceptable structures, and values, though for a given opportunity there is often one particular structure that "fits" the Deal.
- Price is the quantified, asked for value associate with the proposed structure
- There is no practical way of ala carte pricing, especially with multiple or variable deal structures

'Wheelbarrow' Structural Categories

- Cash *When*
- Cash *As*
- Cash *If*
- Cash *Maybe*
- Consideration beyond Cash
- Special circumstances of Equity

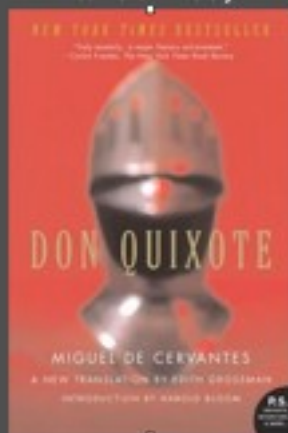
However

- Tension: simplicity & comprehensiveness
- Balancing buyer-seller interests
- Deal management
- Deal failure

We must also remember... [to] not look for precision in all things alike, but in each class of things each precision accords with the subject matter, and so much as is appropriate to the inquiry. For a carpenter and a geometer investigate the right angle in different ways, the former does so in as far as the right angle is useful for his work, while the latter inquires what it is or what sort of thing it is; for he is a spectator of the truth.
Book 1, Chapter 7, Nicomachean Ethics

Business Approach of Dealmaking as a Quest

Best novel in history?



Look my friend, not all knights can be courtiers and not all courtiers can or should be knights errant; there has to be some of each in the world . . . ; courtiers without leaving their chambers or passing beyond the threshold of the court, travel the entire world by looking at a map, nor spending a blanca or suffering heat or cold, hunger or thirst; but we the true knights errant, measure the earth with our own feet, exposed to the sun, the cold, the wind, and the inclemencies of heaven, both night and day, on foot and on horseback, and we know our enemies not only in portraits but in their actual persons, and no matter the danger and regardless of the occasion we do battle with them, not worrying about trifles or the laws governing duels.

Miguel de Cervantes, *Don Quixote*, A New Translation by Edith Grossman, HarperCollins Publishers, 2003, p. 492

Resources: Errata, pdfs, Citations, Spreadsheets, Presentation(s), ...

www.razgaitis.com



The screenshot shows a website for Dr. Richard Razgaitis. The header includes a logo and the name 'Dr. Richard Razgaitis'. A sidebar on the left contains a menu with items like 'Home', 'About Me', 'Professional Activities', 'My Books', 'Public Program', 'Links', 'Media', and 'Contact'. The main content area is titled 'Technology Learning (TV-L)' and contains several paragraphs of text, including a section for 'Opportunity: Disasters' and a list of bullet points. At the bottom of the page, there is a copyright notice: '© 2009, 10/19/09 Razgaitis'.