



University
of Glasgow

An Introduction to Valuing Technology

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NOTE

This presentation will provide an overview of approaches. Anyone who wants a detailed knowledge of university technology evaluation techniques should listen to Ashley J. Stevens of the University of Boston (like I did). My thanks to him for use of his materials.

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I think many people are often confused about why we are interested in technology commercialization, in nurturing start up companies, and in facilitating more patents and license agreements.

It is not about the promise of future revenues that might be generated from this activity.

You heard me correctly. **It is not about the money.**

Of course, revenue generation serves as an incentive. But first and foremost, tech transfer must serve our core mission: sharing ideas and innovations in the service of society's well-being.

In fact, at Michigan we expect to re-invest institutional gains back into tech transfer efforts. **Revenue generation is NOT the ultimate goal.** It is simply the means by which we can increase the transfer of new knowledge into the business sector.”

*Dr. Mary Sue Coleman, President, University of Michigan
AUTM Annual Meeting 2005
Phoenix, AZ*

Yeah, yeah, yeah

- **Except at Budget time!**
- **You don't want to be the goat who left a million pounds/euros/dollars on the table.**
- **You need to have an idea of the value of your technology/offering.**
- **This session will outline some simple and more advanced approaches.**
- **Warning! Some cynical people will suggest that this is a black art and that we are simply using techniques to justify our own assumptions....you can decide.**

...now valuation versus price.

Valuation

- Various techniques
- Different answers
- An opinion



Pricing

- A negotiation
- One outcome
- A commitment

Valuation



Pricing

- With a valuation basis

- You negotiate the basis

Valuation



Pricing

- With a valuation basis
- Without a valuation basis

- You negotiate the basis
- You negotiate from emotion

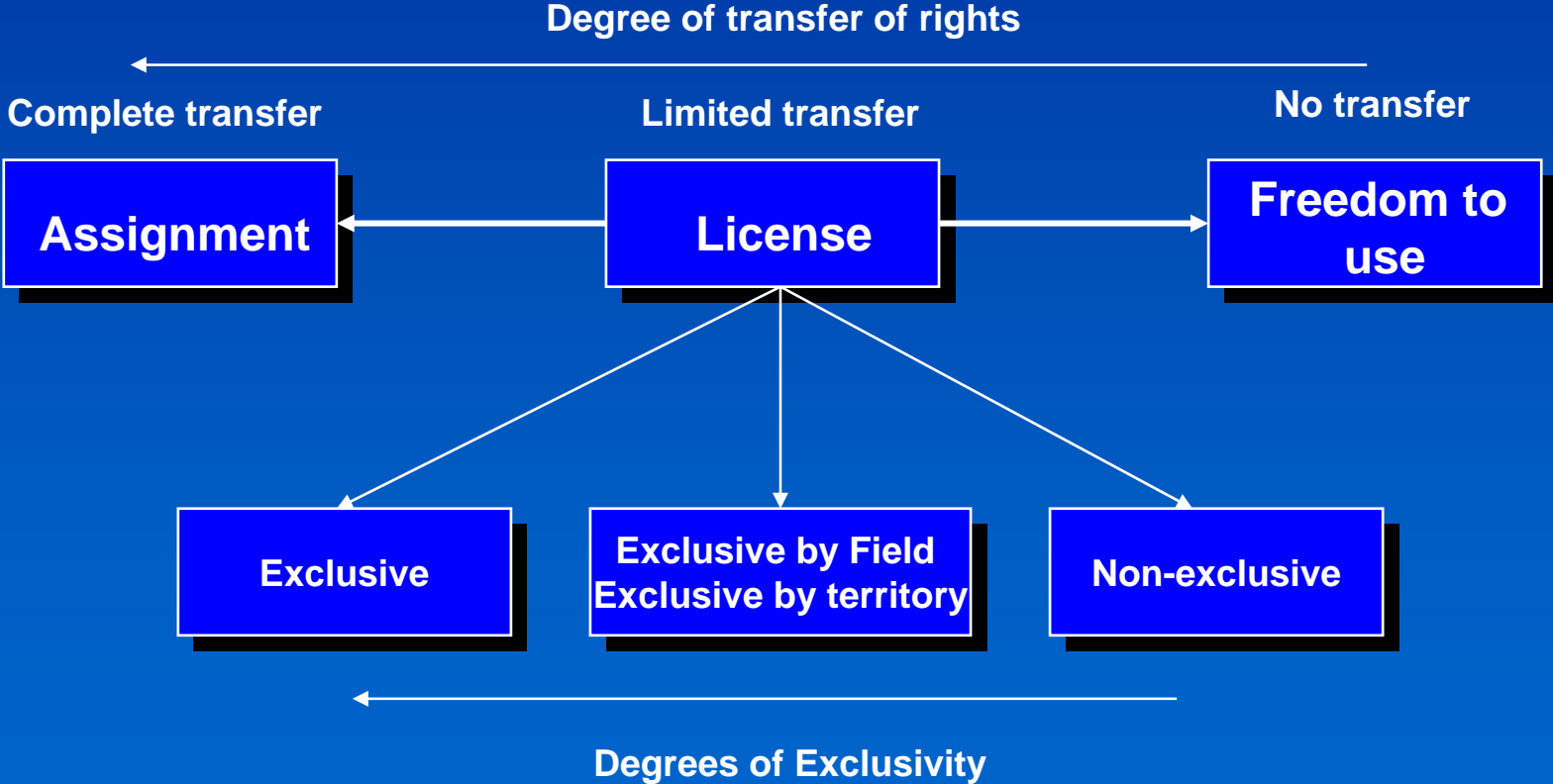
Note that both approaches are legitimate, but it's easier to defend the first one to your boss.

Technology Rights

Technology Rights – things that contribute to value

- **Scope of license**
 - Assignment vs. License vs. Freedom to use
 - Exclusive vs. Non-exclusive
 - Fields of use
 - Geographic extent
- **How strong are the patents**
- **What other technology rights are included**
 - Background rights
 - Improvements
 - Biological materials
 - A prototype
 - Clinical data

Different Degrees of Rights Can be Granted



Characteristics of the Patent

- **What does it protect?**
 - **Composition of matter**
 - **Apparatus**
 - **Method of Use**
 - **Manufacturing process**
 - **Formulation**
- **Does it protect characteristics perceived to be of value by consumers?**
- **How broadly does it exclude others? (i.e., how easily is it avoided?)**

“The economic value of a patent depends fundamentally upon the nature and extent of non-infringing substitutes”

**John Culbertson and Roy Weinstein
“Product Substitutes and the Calculation of Patent Damages”
J. Patent and Trademark Office Society, 70.11, 749-761 (1988)**

Risk

Types of Risk – that can detract from value

R&D risk

Manufacturability risk

Marketing risk

Competitive risk

Legal risk

Patent risk

Overall

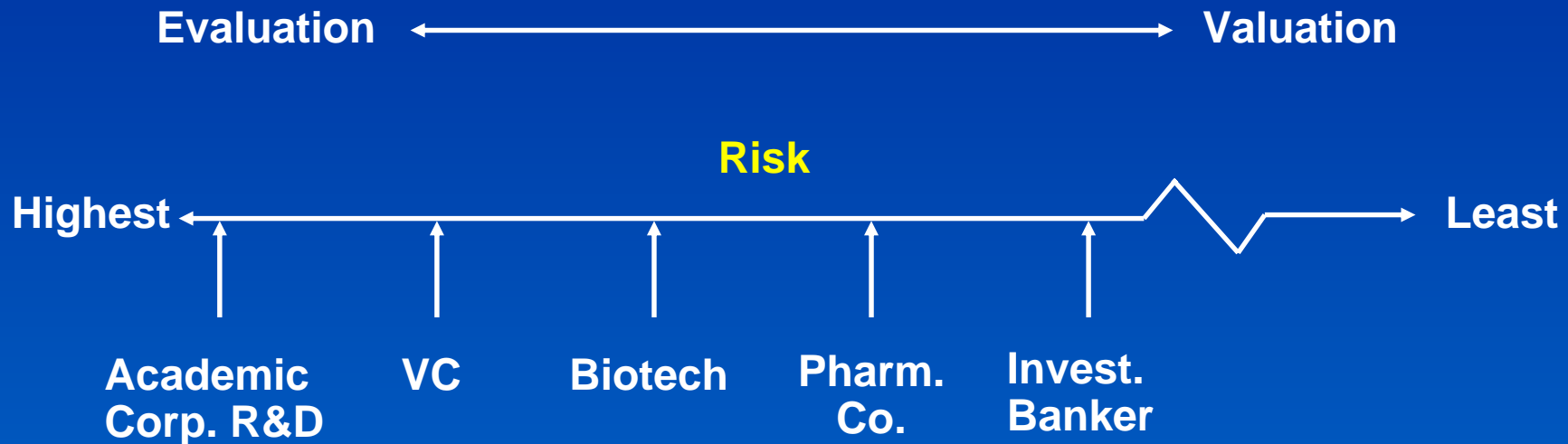
1 in 10,000 drug candidates makes it to FDA approval

1 in 3,000 raw ideas make it to market

33-60% of new product launches fail

....the odds are challenging

Risk vs. Time – Drug Development



Information available at time of valuation

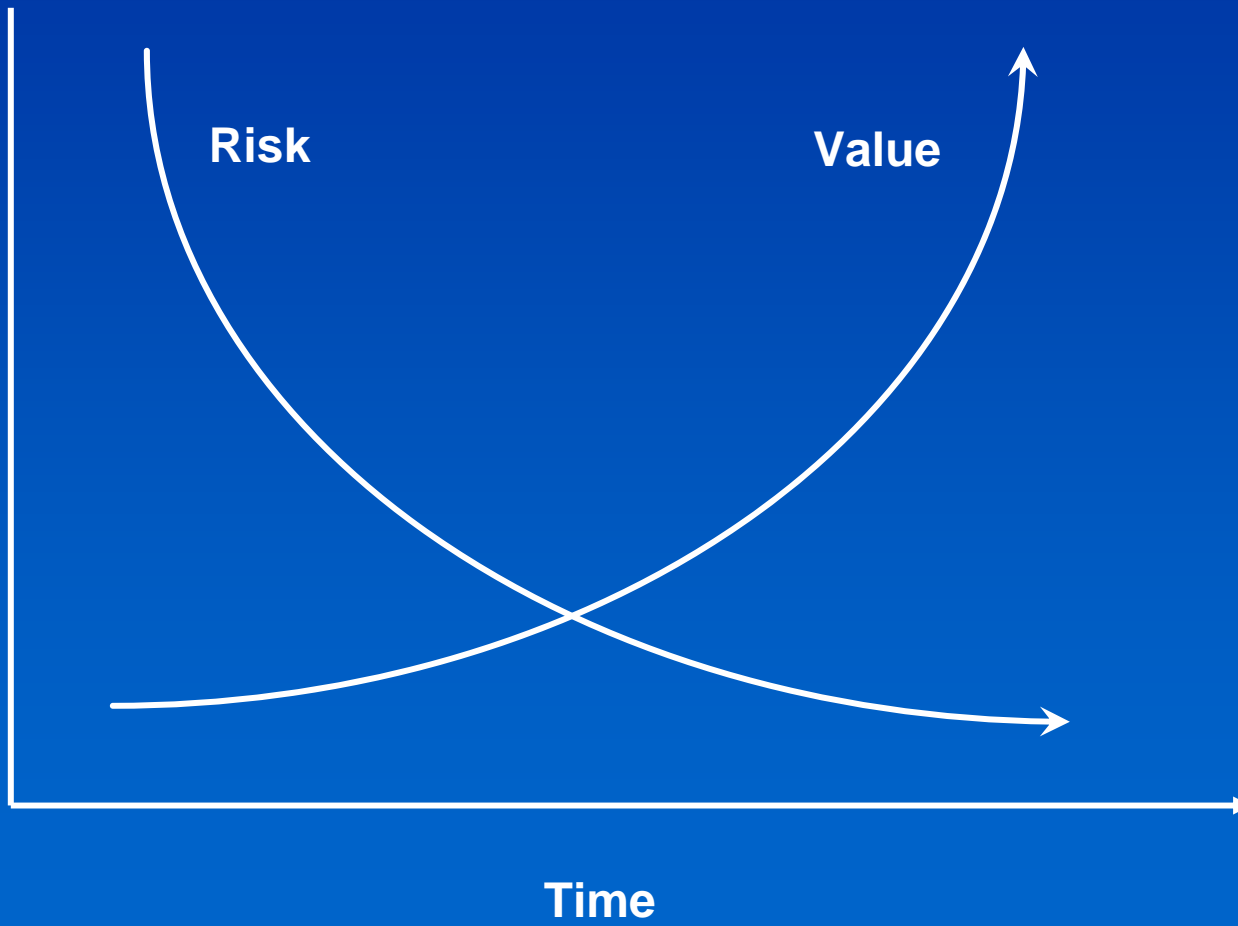
Therapeutic target
Competitive profile
Patent position

Spec. disease
Reg. strategy

Indication
Toxicology
Man. costs

Actual sales
Actual profits

Value vs. Risk



The Basic Ways to Approach Valuation

Look up

Policy

Look back

Cost

Look around

Industry Standards – Comparables

Look at the pieces

Ranking/Rating

Look down

Rules of Thumb

Look forward

Discounted Cash Flow

Look to the dice

Monte Carlo

Look to others

Auction

Look to the market

Equity

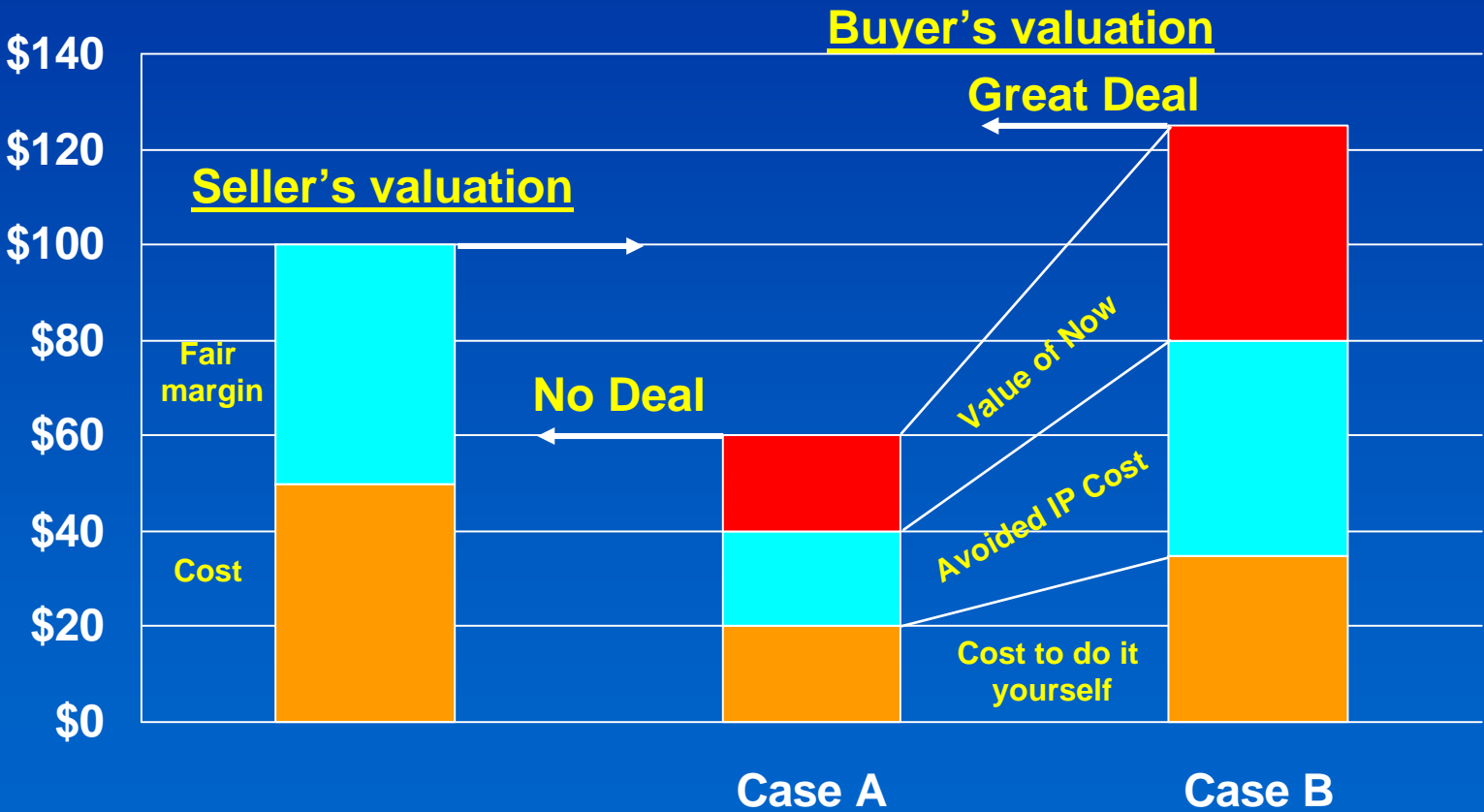
1. Look up - Policy

2. Look Back -- Cost

Look Back -- Cost

- Cost to develop plus a return
- Is cost to develop relevant?
 - Would you want to or be able to sell a used lottery ticket for what you paid for it?
 - Wasn't the technology developed with a **GRANT?**
- Cost driven negotiations are relatively straightforward.

Cost Driven Negotiation



Source: Richard Razgaitis

Look Around -- Industry Standards/Comparables

Sources of Comparable Transaction Data

- Probably the most important method for academic licensing.
- Sources of Comparable Transactions
 - Internal database
 - Published surveys
 - Public announcements
 - Word of mouth
 - Litigation

Internal Database

- Licenses previously done by your office
- Trends over time

Published Surveys

- Relatively few in number
- None very recent
- Best review:
 - Richard Razgaitis in AUTM Licensing Manual, Chapter VII-4

Word of Mouth

- **Techno-I**
 - Created by Donna Baranski-Walker at MIT
 - Moved to SRI International
 - Acquired by UVentures in October 1999
 - UVentures acquired by UTEK in October 2003
 - Free
- **Subscribe:**
 - <http://www.techno-i.org/process.cfm?pageID=4&tl=4>
- **Archives:**
 - Since 1999 via UTEK:
 - <http://www.techno-i.org/process.cfm?pageID=3&tl=3>
 - 1997-1999: <http://groups.yahoo.com/group/techno-i/messages>

Litigation

- Very complete information from patent infringement suits
- Case must go to trial
- Not for the novice
- Sometimes useful information included with complaint e.g.,
 - Gatorade Trust agreement
 - Stokely Van-Camp license
- attached to University of Florida complaint against the Gatorade Trust

Recombinant Capital

San Francisco, CA 94104
phone (925) 952-3870
<http://www.recap.com/>

Two levels of Service

- Recap.com
 - \$1,000 per year + \$100 per extra seat; \$500 set up fee
 - Half price for not-for-profits
 - Database of transactions
 - Fee can be applied to individual transaction documents
 - \$200 per transaction (\$300 if first to request)
- rDNA.com
 - \$6,000 - \$26,000 per year depending on number of users
 - Access to full text of all deals
 - Limited number of “analyzed” deals

Look to the Pieces -- Ranking/Rating

Expert Panels

- Panel of experts reviews technology from various perspectives, e.g.
 - Market size
 - Patent protection
 - Stage of development
 - Probability of success
- Need:
 - Scoring criteria
 - Scoring system
 - Scoring scale
 - Weighting factors
 - Decision table

Expert Panels

- **Pros:**
 - Prepares for license negotiations
 - Allows comparison of technology with others on a common basis
- **Cons:**
 - Need a comparable to which to apply the results
 - Highly subjective
 - Needs a panel of “regulars” to be effective
 - Larger offices have a weekly “triage” meeting
 - All review and rate/rank new invention disclosures

Look to your Hand – Rules of Thumb

-- the 25% Rule

A Fundamental Principle of Technology Valuation

The Goldscheider Principle

(aka the 25% Rule)

**“ The Licensor should receive 25% and
the Licensee 75% of the pre-tax profits
from a licensed product ”**

The 25% Rule

- Relationship of royalty rate to profitability first raised in *Horvarth v. McCord Radiator and Mfg. Co. et al.*, 100 F.2d 326, 335 (6th Cir. 1938)
- First enunciated by Albert S. Davis, General Counsel, Research Corporation “*Basic Factors to be Considered in Fixing Royalties*” in “*Patent Licensing*”, Patent Law Institute, 1958
- Robert Goldscheider and James T. Marshall “*The Art of Licensing -- From a Consultant’s Point of View*”, 2, *The Law and Business of Licensing* 645 (1980)
- Recent review in *les Nouvelles* “*Use of the 25 Per Cent Rule in Valuing IP*” Robert Goldscheider, John Jarosz and Carla Mulhern, 37 123-133, December 2002

The 25% Rule

- Based on empirical observations
 - 18 worldwide licenses by Swiss subsidiary of US company starting in 1959
 - Complete IP portfolio - patents, ongoing know-how, trademarks, copyrighted product materials
 - 3 year term, so readily replaceable if terms inappropriate
 - Licensors made ~20% pre-tax profit, paid 5% royalty; were either #1 or #2 in their market despite strong competition
 - Concluded that the licenses resulted in successful, long term win-win relationships
- Is actually the 25-33% rule
- Applied to fully-loaded pre-tax profits, not gross margin

Justifications

- It works – Goldscheider and thirty years of experience
- Businesses often require a 3x return to make an investment
- R&D is only $\frac{1}{4}$ of the way to a new product
- R&D is 39% of pre-tax profits of all US public companies
(*Business Week, 1994*)

Application

- Expressed as a % of net sales in license
 - $\text{royalty rate} = 25\% \times \text{expected profit margin}$
- Starting point for negotiation; tune up or down for
 - significance of IP portfolio
 - who bears principle burden of risk
- Limited value in academic licensing negotiations because of uncertainty of ultimate profitability
- Of most relevance when you're licensing to a new industry
- Major importance in infringement -- reasonable royalties theory

Look forward –

Discounted Cash Flow/Net Present Value

Time Value of Money

- Getting \$1,000 next year isn't worth as much as getting \$1,000 tomorrow
- What would we pay today to receive \$1,000 in a year?
- Need to be compensated for:
 - Inflation
 - Risk the payment won't be made
 - A return on the investment

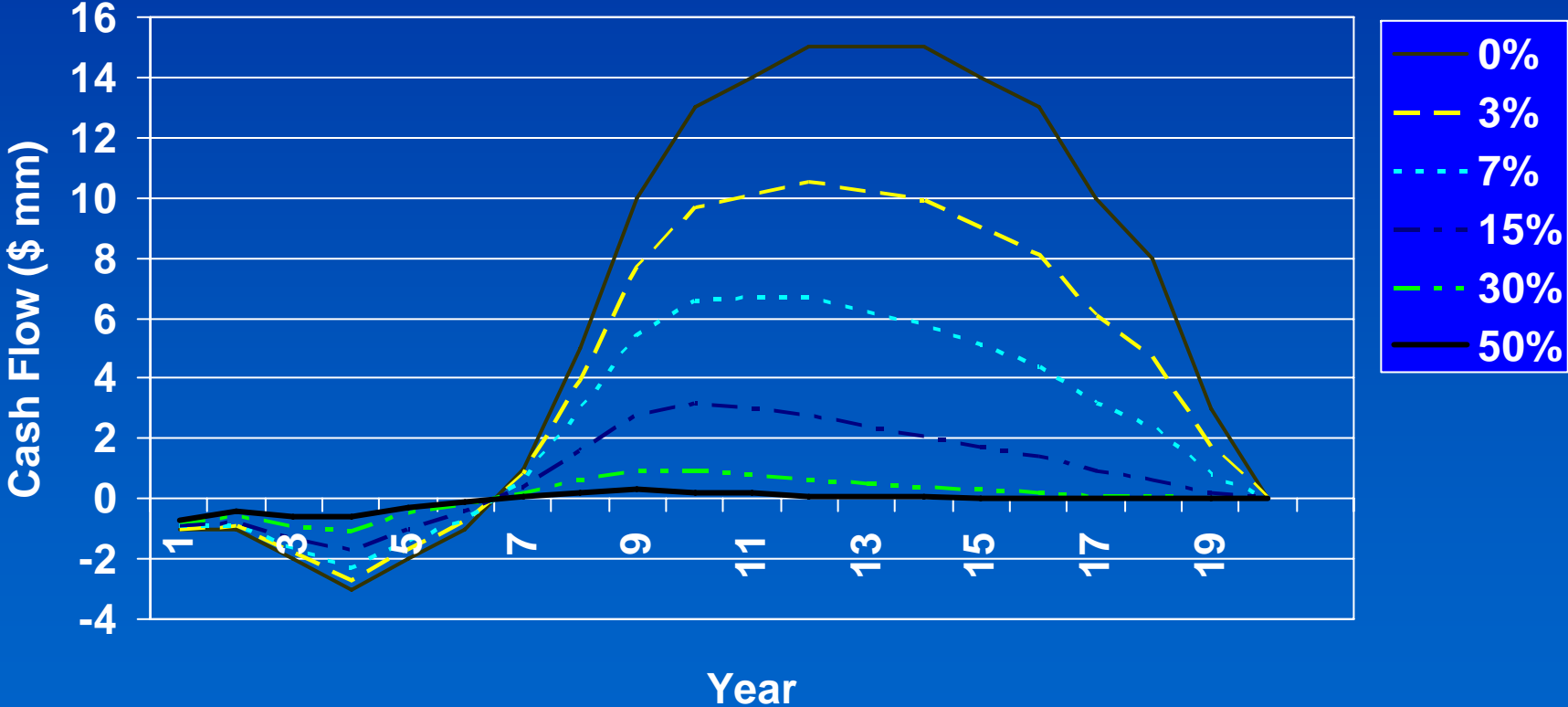
Net Present Value Calculations

- **Takes into account the facts:**
 - Expenses are certain and early
 - Return is later and uncertain
 - Product may not succeed
 - Market may not be there

A Typical R&D Project

- \$10 mm invested over 6 years
- Sales start in year 7
- Peak profits of \$15 mm in years 12-14
- Over by year 19
- Total Net Income of \$136 mm
- Net Profits exceed expenses by \$126 mm
 - Looks like a good deal

How it looks at various discount rates



Source: Richard Razgaitis

Issues with NPV Calculations in Academic Licensing

- What will the market be and the profit margin?
- How do you value stock that's part of the license?
- Extreme uncertainty of the development pathway
 - Will the licensee take the product to market or will it be a sublicensee?
 - How much of the development cost will they shift to the sublicensee?
 - What will the licensee's return from the sublicensee be?
- An extremely useful exercise to look at the value of the components of the deal and trade-offs between them

Look to Others -- Auctions

Auction Considerations

- Only works for a hot technology – seller's market
 - Need at least 3 bidders
- Technology must be readily understood and evaluated
- If unacceptable bids, technology will be perceived as damaged, because of visibility of the process

See:

- <http://www.jp-auction.eu>
- <http://www.oceantomo.com/auctions.html>
- <http://www.jpauctions.com/>

**“A hot academic technology is one that two
companies are interested in”**

(emphasis added)

Lita Nelsen
MIT
1991

Look to the Market -- Equity

“Equity is just cash that hasn’t turned green yet”

**Joyce Brinton
Harvard University
1998**

How do you get equity in a license?

- to pay early substitute for one or more cash components
 - Remember -- “Equity is just cash that hasn’t turned green yet”
- Generally the upfront fee
 - For the technology
 - For other value contributed if a start-up you’re helping create the company
- Can allow milestone payments in stock

Issues with Equity

- Usually on offer in start-up companies.
- Can escalate in value hugely in a way that a licence seldom can (think Google).
- It's of no value until liquid
- Can leave you with a pile of old share certificates that someone needs to keep an eye on.

The value of the equity is as uncertain as the value of the technology.

....so to summarise and conclude

In Conclusion

- You can attempt valuation based on
 - simple approaches (cost, rule of thumb)
 - market comparisons (industry standards/ranking/databases)
 - calculation (Discounted cash flow/NPV)
 - market demand (Auction/equity)
- This has been a skip through some approaches, you can mix and match to suit your needs.
- Ashley Stevens can give more detail on these and other approaches.