

Opleiding SBO

IP Valuation

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Commercialising IP

Based on webinars given for *epi*



Agenda IP Valuation

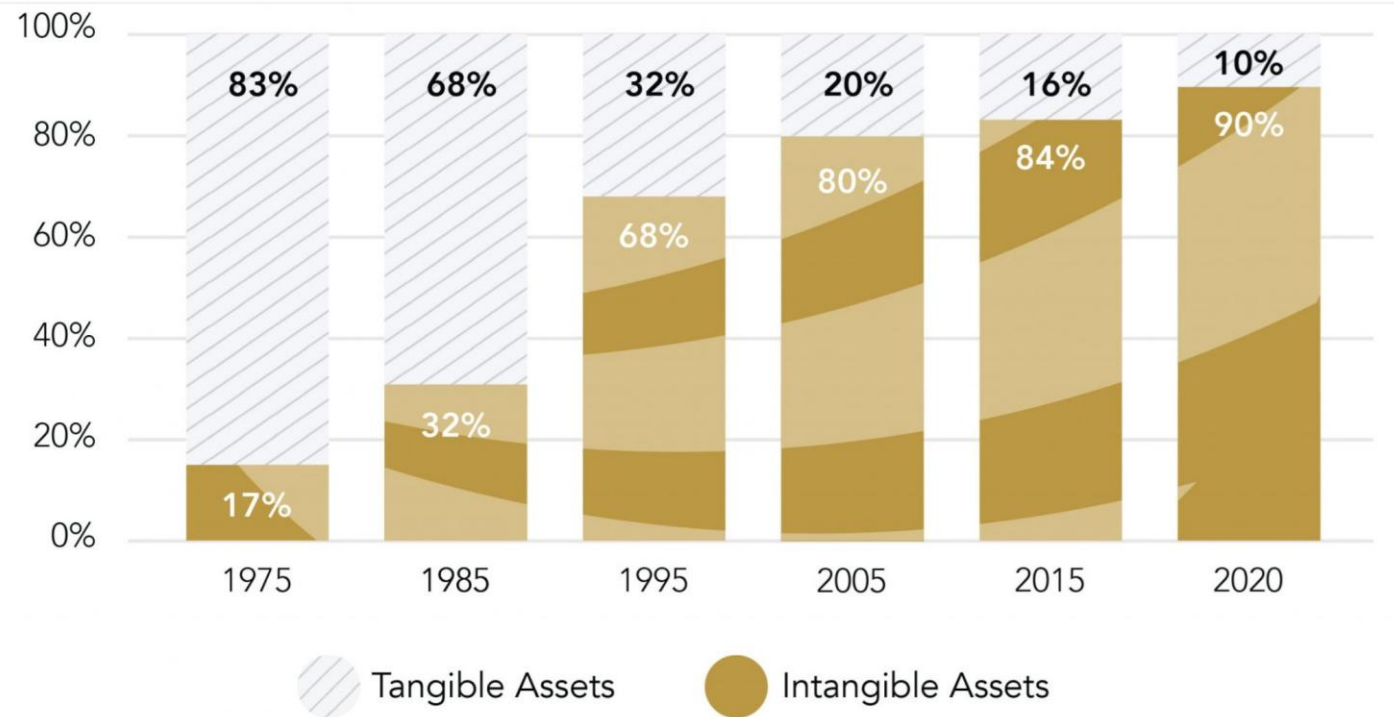
- Introduction:
- Patent Valuation Methods
 - Costs
 - Market
 - Income
- Example income discounted cash flow
- Summary

True value of a company

- Tangible assets:
 - Working capital: Cash, inventory etc.
 - Fixed assets: Manufacturing equipment, buildings, office equipment etc.
- Intangible assets:
 - Experienced workers, customer lists, manuals etc.
 - Intellectual Property: Patents, trademarks, designs, know-how, goodwill

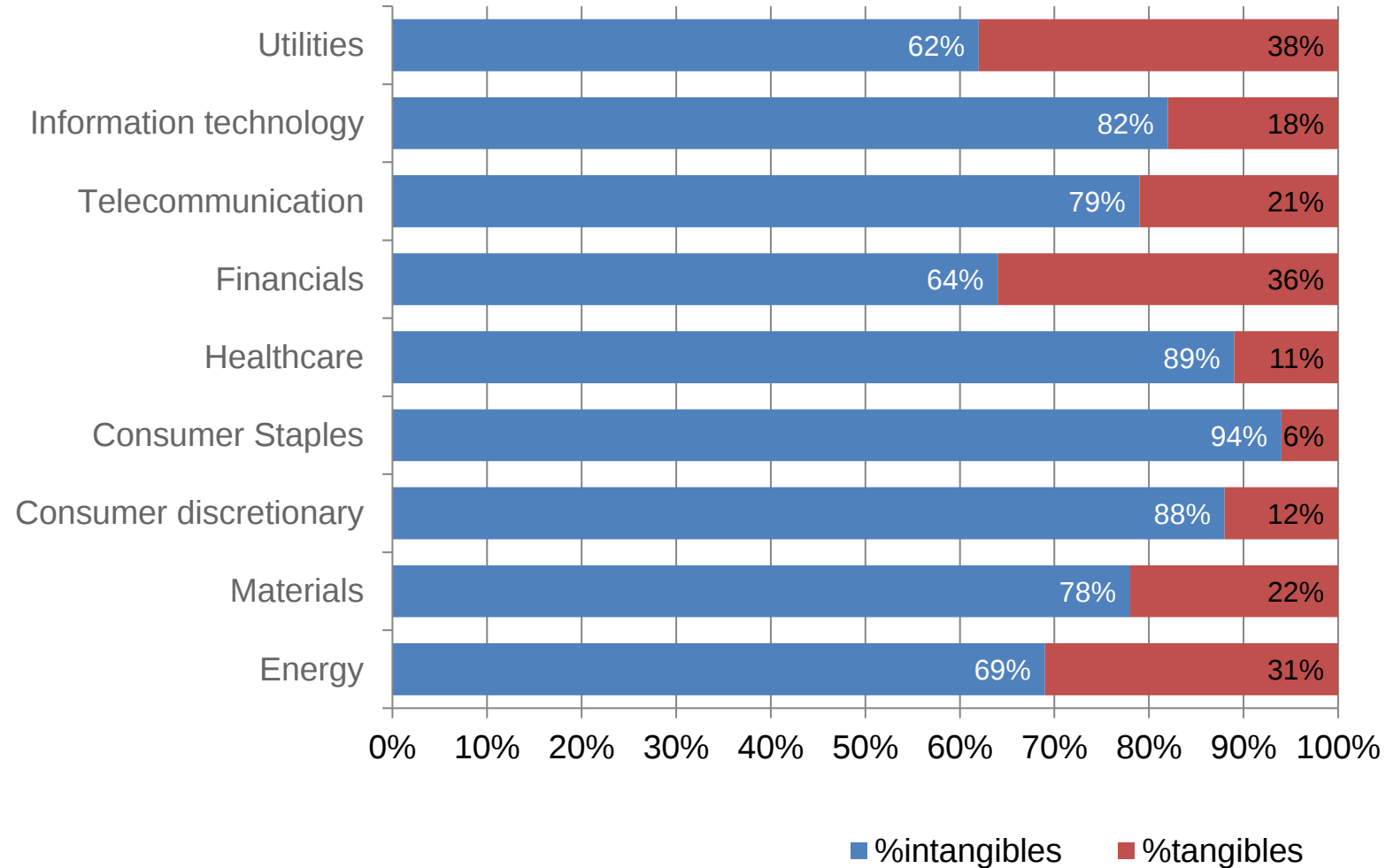


Trends in company valuation



Source: Ocean Tomo: Components of S&P 500 market value

Trends in company valuation



- So a company's value depends for a large part on its intangible assets
- Therefore, important to know this value

If you don't know your own value,
Somebody will tell you your value,
And it will be less than you're worth

Bernard Hopkins

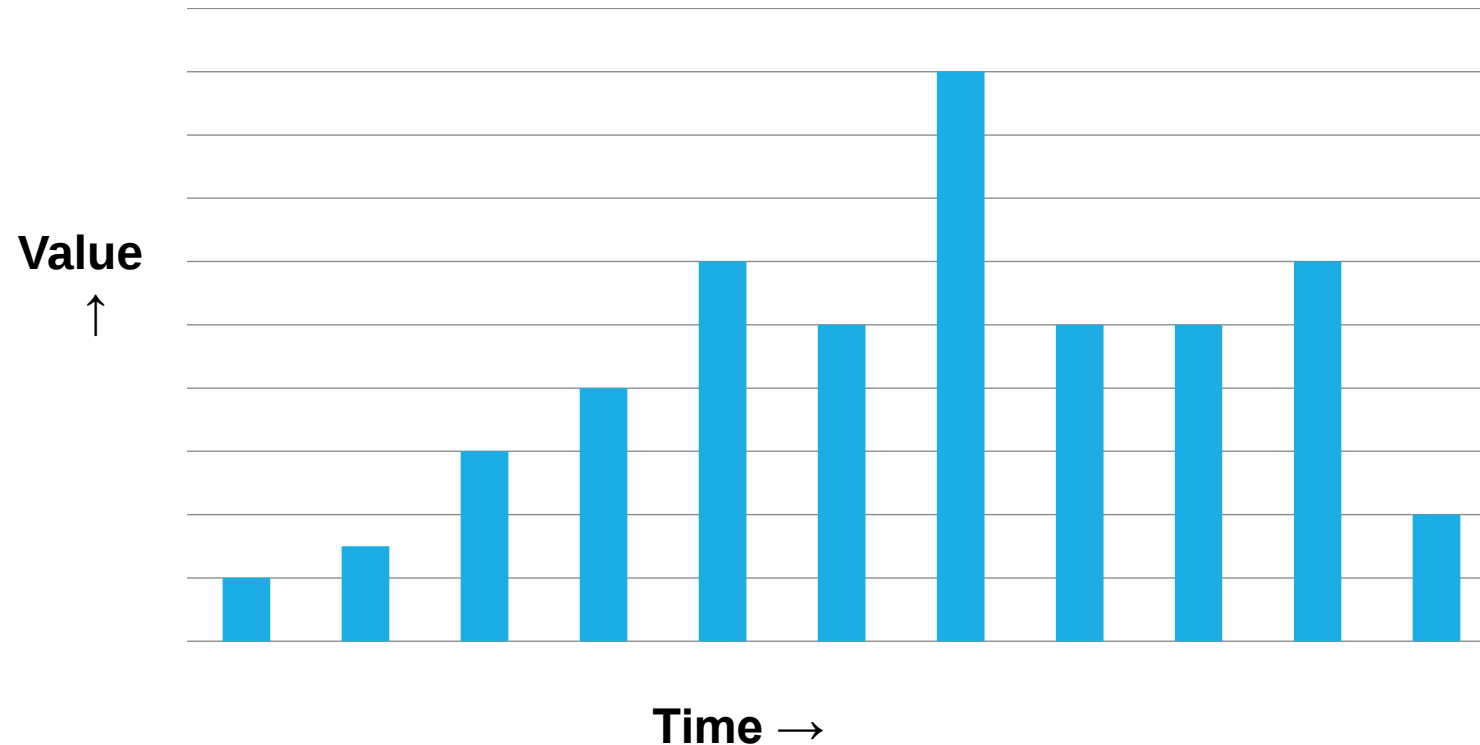
What are valuations used for?

- External transactions
 - Licensing / purchasing / sale / joint venture
 - Getting finance
 - Use as security for debt
 - To prevent accusations state aid
- Internal:
 - Showing value portfolio created by R&D and IP department
 - Management decisions: foreign filing, prosecution



Patent valuation

- Value is an attempt to normalization: single lump-sum for intangible property varying in value over time



Predicting the future (after R. Pitkethly)

- The concept is interesting and well-formed, but in order to earn better than a 'c' the idea must be **feasible**. Yale professor to Fred Smith when proposing overnight delivery service. Fred later founded Federal Express Corp.
- I think there is a world market for maybe five **computers**. Thomas Watson, CEO of IBM in 1943
- We don't like their sound and guitar is on the way out. Decca recording rejecting the Beatles in 1962

Predictions are inaccurate or plainly wrong

Risk/uncertainty factors:

Risk can be measured/calculated

Uncertainty just happens

- **Legal:** for instance Biotech directive, Computer Implemented Inventions (CII) directive, Brexit
- **Technological:** Hybrid / fully electrical / H₂ cars
- **Market:** Corona, unexpected economic crisis
- **Many decision paths for IP:** foreign filing in BRIC countries, troubles CN-US, Brexit
- **Human factor:** wrong decisions



Patent valuation dilemma

- Patent must be novel and inventive, but....
- To be able to value an invention must resemble others of known value

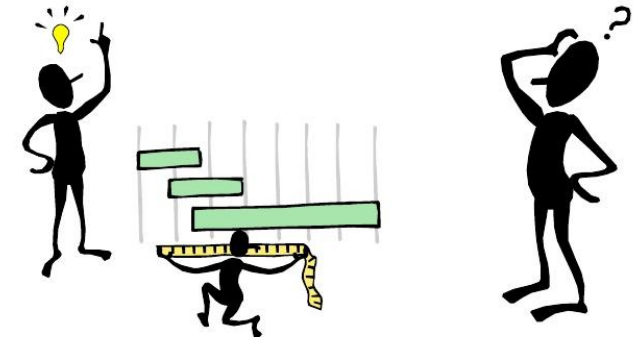


Variables in patent valuation

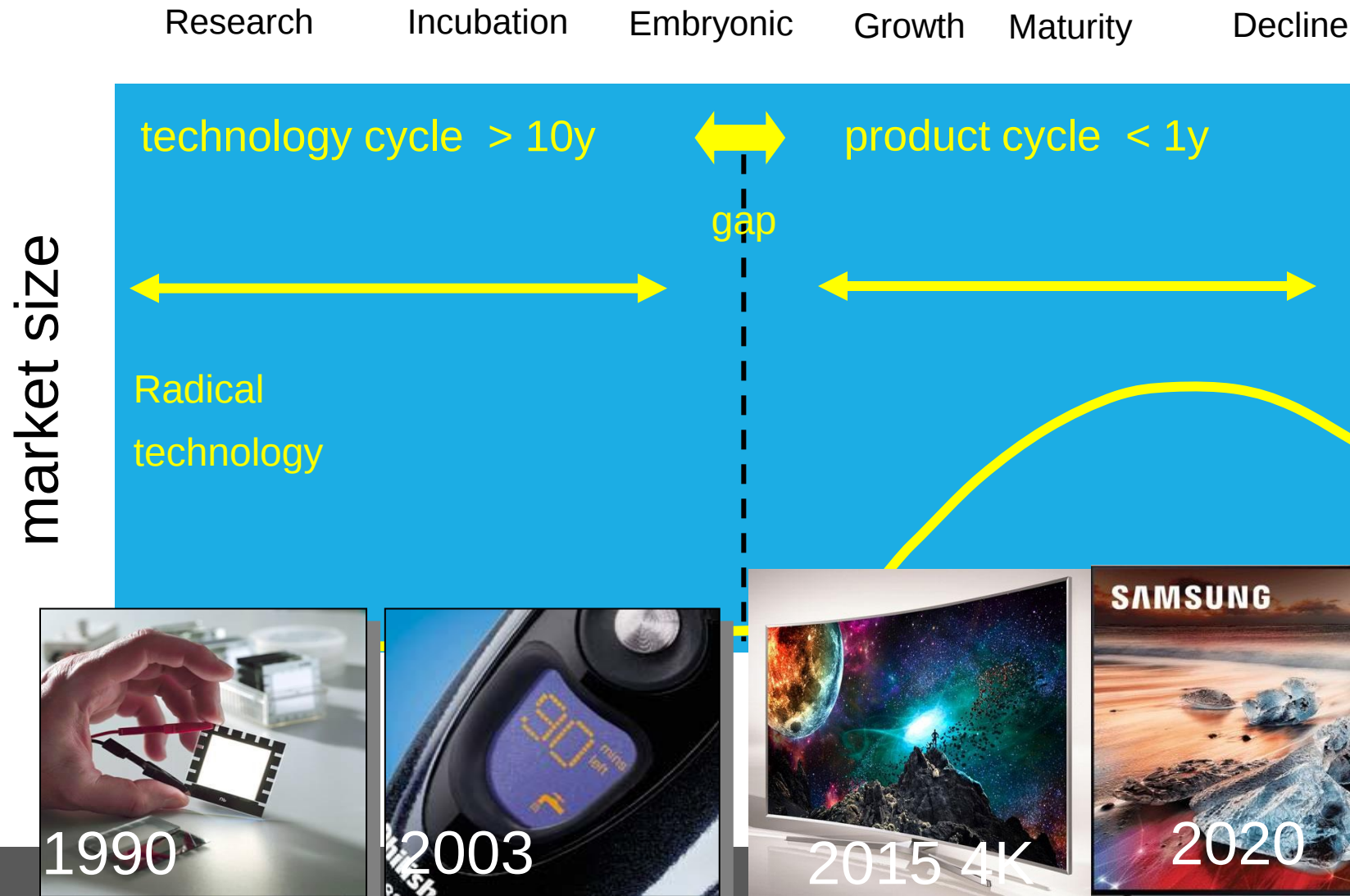
- **Legal status:** patent strength, broadness, portfolio, countries, status, detection of use, prosecution history, ownership, commitments, regulatory
- **Technology:** prospects, demands, usefulness, substitution, copycats, stage
- **Market conditions:** competitors, growth, lifetime, licensing opportunities, specific countries like CN
- **Finance:** costs product, earnings, investments
- **Strategy:** use of patent

From IPscore 2009

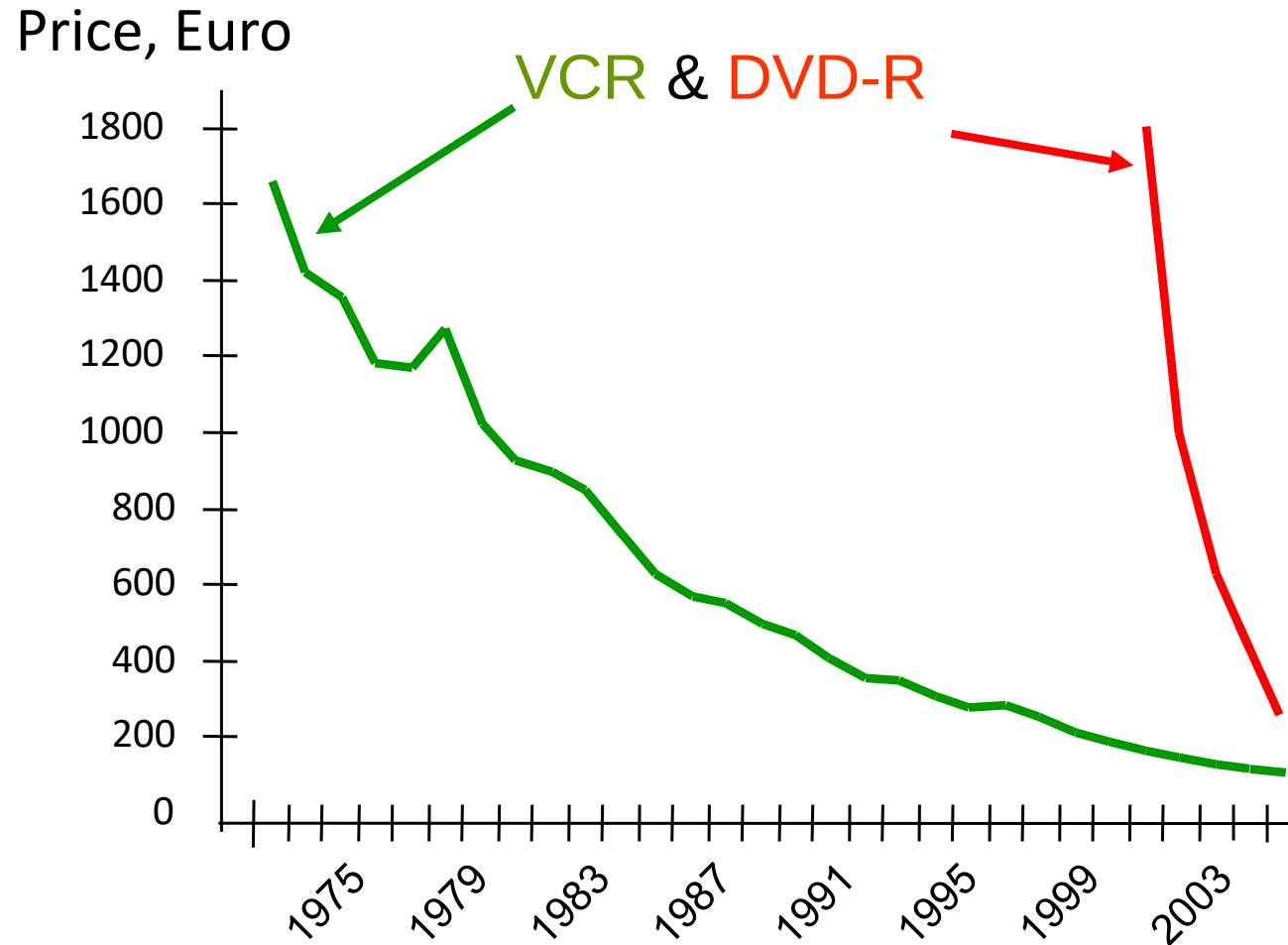
What is a Variable?



Market dynamics vs. technology dynamics



Dependence of selling price on time (Philips example)



Valuation of IP

- **Cost approach**
 - Historic, reproduction or replacement costs adjusted for depreciation and obsolescence
- **Market approach**
 - Based on multiple similar market transactions (like tax on houses)
 - Industry standard rates
- **Income approach:** projected cash flows
 - Net present value of earnings (licenses) of asset or costs avoided



Patent valuation methods

- If valuation is part of a negotiation than what the other side will accept is just as important as any objective justification for the valuation method





Examples

Intangible asset

- Trade mark
- Product / technology IP
- Software

Valuation method

- Market or income based
- Income based
- Replacement costs

Cost approach



- Historic, reproduction or replacement costs adjusted for depreciation and obsolescence is used as a basis for the value of the IP, i.e. what would it cost to generate the IP now
- Can be used as a check for other methods

Costs approach

Advantages:

- When no market data
- Unusual IP: like software, workforce
- For internally developed intangibles or in liquidation
- Can be used to value patent applications



Costs approach

Disadvantages:

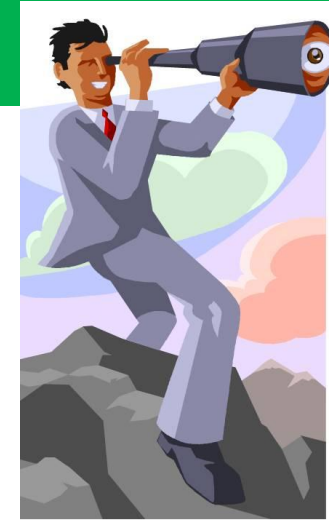
- Market is indifferent to costs
- No relation costs-value
- Costs can be made up
- Difficult to verify/apply
- Costs can be relevant in negotiations:
 - Licensee may have to duplicate work if no license
 - Licensee will loose time if no license



Market approach

Value of patent (portfolio) is based on value of patent (portfolios) handled in similar transactions:

- Based on multiple similar market transactions
- Industry standard royalty rates
 - royaltyrange.com / royaltysource.com / ktmine.com



Looking
for
Market
Value

What determines the royalty rate?

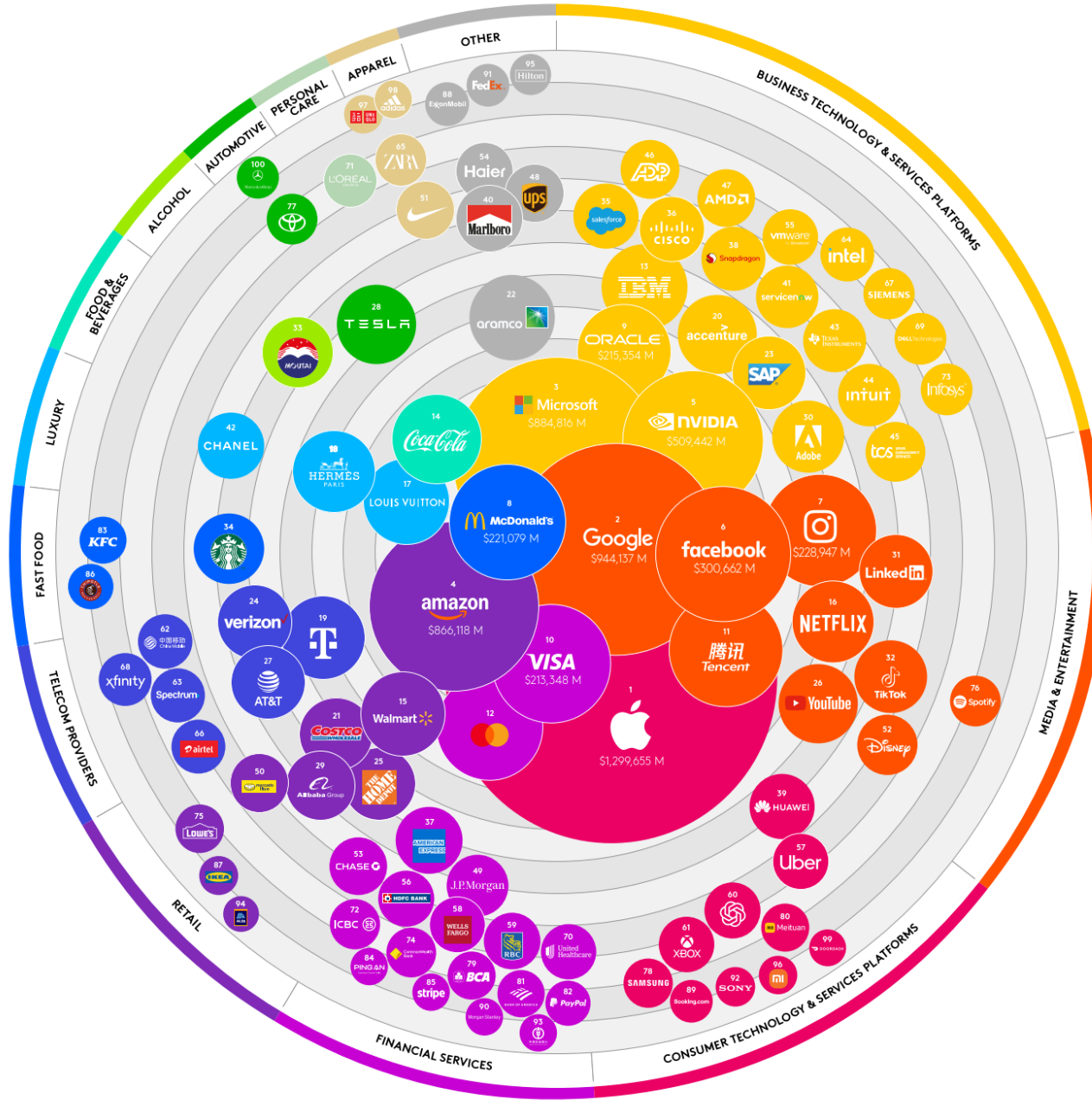
- Both parties need a win- win
- Importance IP
- Strength IP
- Negotiating strength parties
- Market values for royalty rates



“Les Nouvelles” – LESI Journal (September 2010)

Table 1. Running Rates by Agreement Type and Industry ¹ Median (Average in Parentheses)					
Agreement Type	Industry				
	All	Software	Hardware	Medical	Pharma
All Types	5.0% (8.2%) n = 2,963	10.0% (17.3%) n = 515	5.0% (7.0%) n = 489	5.0% (5.6%) n = 520	5.0% (6.2%) n = 1,439
Product/ Distribution ²	10.0% (15.4%) n = 339	14.4% (18.9%) n = 180	6.0% (12.8%) n = 58	5.0% (7.9%) n = 44	8.0% (12.6%) n = 57
Development/JV ³	6.5% (9.5%) n = 482	17.0% (21.2%) n = 65	4.0% (8.1%) n = 71	6.0% (6.7%) n = 53	6.0% (7.7%) n = 293
Acquisition ⁴	5.7% (9.1%) n = 350	10.0% (16.4%) n = 90	5.0% (6.4%) n = 78	5.0% (6.1%) n = 56	5.0% (6.8%) n = 126
Settlement ⁵	5.0% (6.1%) n = 87	4.6% (7.6%) n = 10	6.0% (7.1%) n = 12	5.0% (5.5%) n = 33	4.6% (5.9%) n = 32
Patent (+) ⁶	4.5% (5.1%) n = 570	4.0% (4.4%) n = 17	4.4% (4.9%) n = 95	5.0% (5.4%) n = 109	4.5% (5.1%) n = 349
Research ⁷	4.0% (4.4%) n = 118	5.5% (5.5%) n = 2	3.0% (5.3%) n = 5	3.6% (4.0%) n = 18	4.0% (4.4%) n = 93
Bare Patent ⁸	3.0% (3.7%) n = 343	3.0% (3.3%) n = 17	3.5% (3.9%) n = 56	3.5% (3.9%) n = 73	3.0% (3.6%) n = 197
Other ⁹	5.0% (8.9%) n = 674	11.6% (18.1%) n = 134	5.0% (6.9%) n = 114	4.0% (5.6%) n = 134	5.0% (6.9%) n = 292

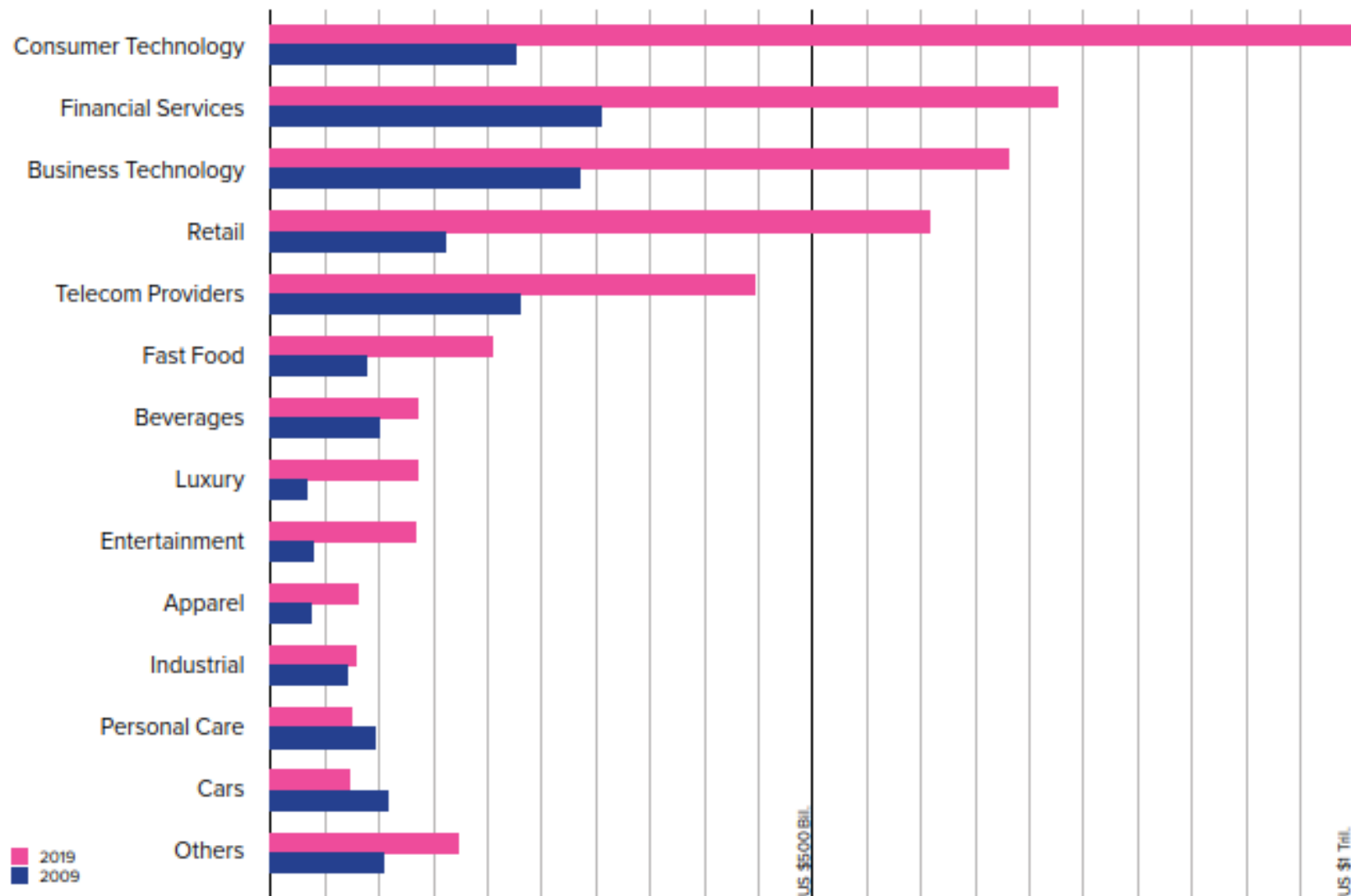
2025 MOST VALUABLE GLOBAL BRANDS



BRAND	BRAND VALUE (US\$M)	BRAND	BRAND VALUE (US\$M)
1 APPLE	1,299,655	51 NIKE	49,444
2 GOOGLE	944,137	52 DISNEY	48,665
3 MICROSOFT	884,816	53 CHASE	48,117
4 AMAZON	866,118	54 HAIER	47,578
5 NVIDIA	509,442	55 VMWARE	47,076
6 FACEBOOK	300,662	56 HDFC BANK	44,959
7 INSTAGRAM	228,947	57 UBER	44,197
8 MCDONALD'S	221,079	58 WELLS FARGO	44,196
9 ORACLE	215,354	59 RBC	44,179
10 VISA	213,348	60 CHATGPT	43,562
11 TENCENT	174,005	61 XBOX	43,047
12 MASTERCARD	167,882	62 CHINA MOBILE	41,299
13 IBM	125,973	63 SPECTRUM	40,037
14 COCA-COLA	119,979	64 INTEL	37,390
15 WALMART	119,580	65 ZARA	37,246
16 NETFLIX	115,271	66 AIRTEL	37,094
17 LOUIS VUITTON	111,938	67 SIEMENS	36,390
18 HERMÈS	109,421	68 XFINITY	36,069
19 TELEKOM/T-MOBILE	105,717	69 DELL TECHNOLOGIES	35,446
20 ACCENTURE	103,810	70 UNITEDHEALTHCARE	35,238
21 COSTCO	100,809	71 L'ORÉAL PARIS	35,090
22 ARAMCO	93,554	72 ICBC	33,915
23 SAP	92,347	73 INFOSYS	33,096
24 VERIZON	90,490	74 COMMBANK	32,093
25 THE HOME DEPOT	89,230	75 LOWE'S	30,859
26 YOUTUBE	89,110	76 SPOTIFY	29,687
27 AT&T	86,878	77 TOYOTA	29,329
28 TESLA	86,043	78 SAMSUNG	29,253
29 ALIBABA	81,208	79 BCA	27,749
30 ADOBE	80,759	80 MEITUAN	27,925
31 LINKEDIN	76,636	81 BANK OF AMERICA	27,524
32 TIKTOK	75,669	82 PAYPAL	27,228
33 MOUTAI	74,446	83 KFC	26,875
34 STARBUCKS	69,732	84 PING AN	26,326
35 SALESFORCE	69,503	85 STRIPE	26,127
36 CISCO	68,268	86 CHIPOTLE	26,125
37 AMERICAN EXPRESS	65,886	87 IKEA	25,673
38 SNAPDRAGON	65,632	88 EXXONMOBIL	25,544
39 HUAWEI	64,657	89 BOOKING.COM	25,060
40 MARLBORO	64,101	90 MORGAN STANLEY	24,784
41 SERVICE NOW	62,481	91 FEDEX	23,978
42 CHANEL	62,292	92 SONY	23,858
43 TEXAS INSTRUMENTS	59,863	93 AGRICULTURAL BANK OF CHINA	23,550
44 INTUIT	59,009	94 ALDI	23,386
45 TATA CONSULTANCY SERVICES	57,333	95 HILTON	23,000
46 ADP	56,969	96 XIAOMI	21,917
47 AMD	56,629	97 UNIQLO	21,599
48 UPS	55,007	98 ADIDAS	21,067
49 J.P. MORGAN	50,697	99 DOORDASH	20,880
50 MERCADO LIBRE	49,846	100 MERCEDES-BENZ	20,815

Consumer technology brands evolve into ecosystems...

Over the past 10 years, the consumer technology brands have grown to over \$1 trillion in value, reflecting how people have come to rely on the convenience of online services, mobile apps, and the voice assistance offered by technology ecosystem brands.



Value changes
2009 vs 2019

How to estimate value IP via market model

1. Estimate value of a company:

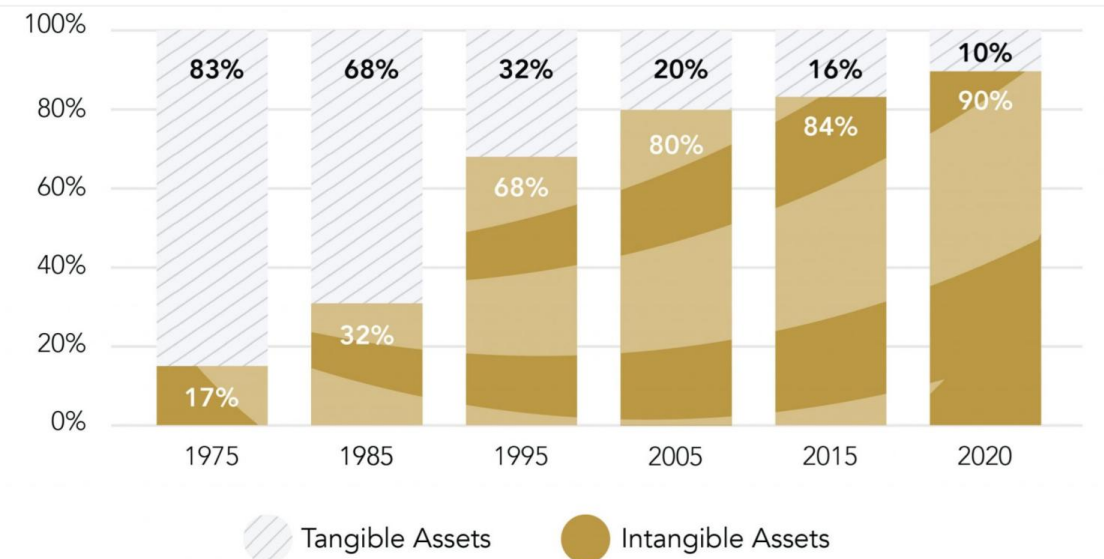
- Service company: 5 – 10 profit company
- Nowadays also up to 10 annual turnover for larger companies taken over by multinationals

2. Circa 80-90 % value are intangible assets

- Goodwill: Trade Mark, Trade Name
- Know-how, Technology: Patents, Trade secrets

First approximation value IP portfolio:
70-80% estimated value of company

Components of S&P 500 market value



Market approach

Advantage:

- Empirical evidence value
- Market values
- Easy: no calculations required
- Often used in litigation and opinions
- Point of reference
- Standard impact on margins
- Most reliable when multiple deals are done under same conditions



Market approach

Disadvantage:

- Not based on own valuation
- Time lag since publication: pre-economic crisis !
- No basis for 'royalty bearing products'
- No insight in IP used in transaction
- Wide ranges
- Uncertainty details: scaling of royalty rates?
- No insight in other provisions
- Generally data not available / not public / not sufficient transactions



Income approach

- IP income based on sharing of future profit between IP generator and the user of the IP.
- Royalty percentage over turnover
- Often used: **25% Rule**, based on 4 necessary stages for making profit with product:
 1. Research: create technology and patents
 2. Development: create market ready products
 3. Production: actually make products
 4. Sell products (use trade marks) / make profit

Thus 1 out of 4 stages is ~25% of net profit should be attributed to technology and patents

Income approach: projected cash flows

Value of patent (portfolio) is based on

Net Present Value of future income:

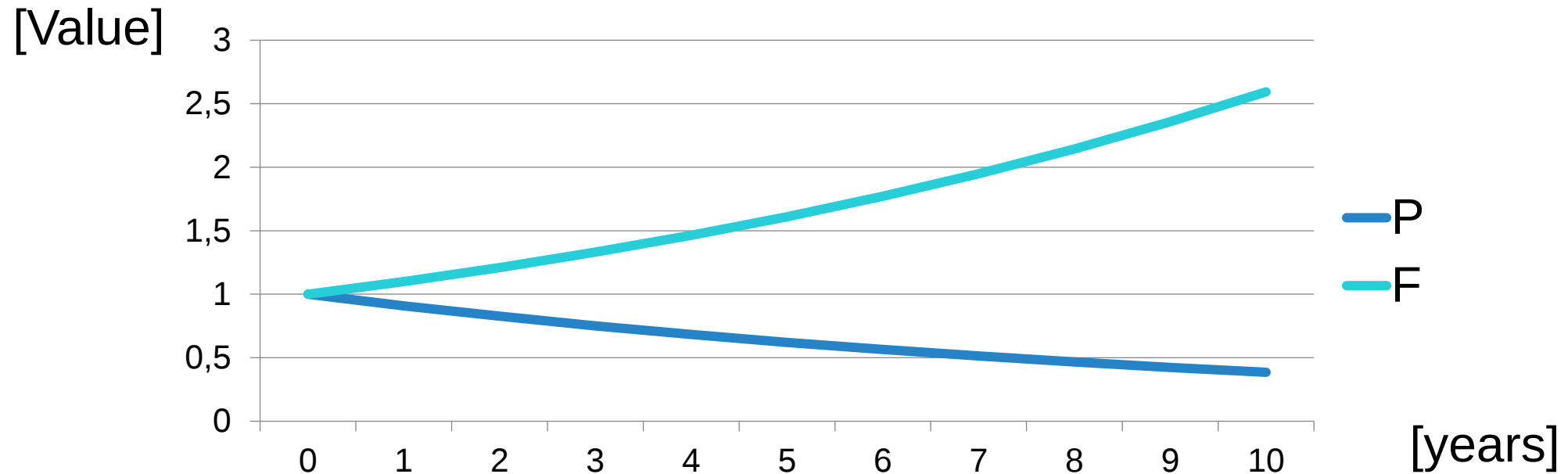
- Time when income will be generated must be taken into account
- Discounted Cash Flow (DCF) methods means money now is more valuable than in future (think of: inflation, loss of interest etc.)

Net present value correction

F = Future value, P = Present value, r = discount rate (rate of return, interest rate) %, T = Time

$$F = P \cdot (1+r)^T \text{ (interest)}$$

$$P = F / (1+r)^T \text{ (inflation)}$$



Income approach

Calculate future income:

- ***Premium profit:*** excess profit over comparable companies with no such IP
- ***Premium pricing:*** premium price over prices of generic goods with no such IP
- ***Relief from royalty:*** royalties due if 3rd party owns IP
- ***Cost savings:*** costs saved by owning IP

Introducing Risk

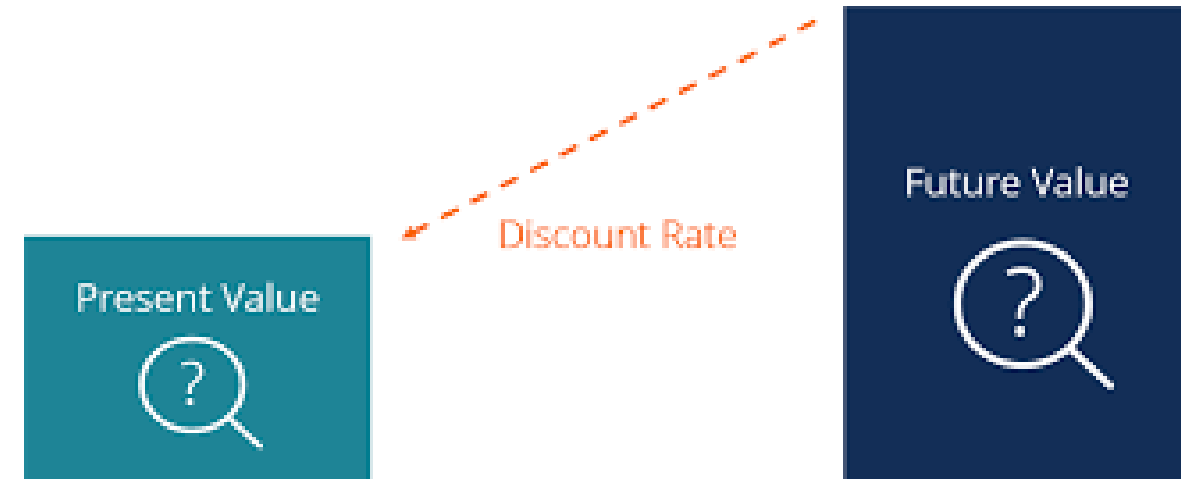


- ***Discounted cash flow:*** Risk is taken into account by special discount rate based on stage of the invention
- ***Risk factor (Technology factor):*** Risk is taken into account by correcting risk-free NPV by a risk factor based on stage of the invention

Discounted cash flow method

Discount rates (r):

- Risk free rate: 6 – 8%
- Fixed assets: ~8%
- Insertion in existing system: 15 -25%
- For start-ups patents: ~25%
- Product launch: 25 – 35%
- Ready for market testing: 35 – 45%
- Proof of principle established: 40-50%
- Embryonic technology >50%



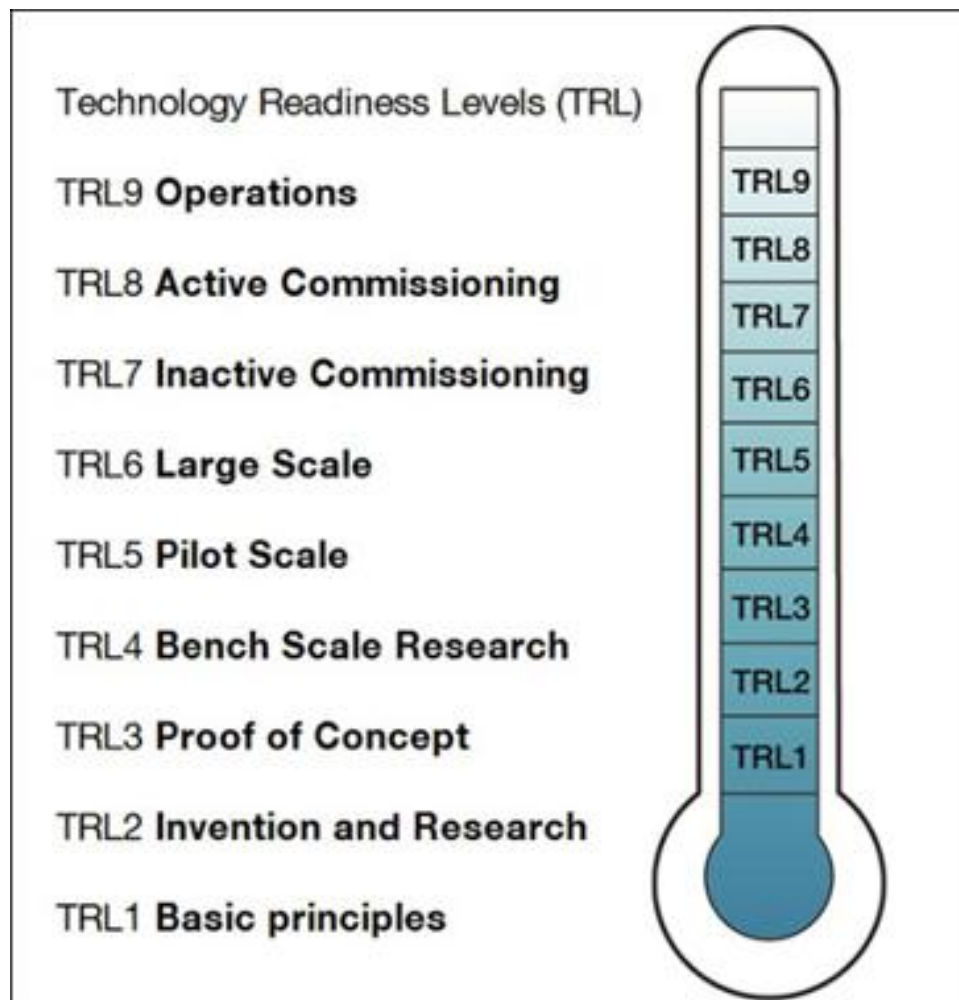
Technology factor

Also known Risk factors based on: (See D. Reinhardt, Sam Khoury, Inavisis 2005)

- **Attributes of product:**
 - Acceptance to market
 - **Marketing effort**
 - Remaining life technology
 - Time required for implementation
 - Capital required for implementation
- **Competitive attributes:**
 - Alternative technology
 - **Legal strength**
 - Differentiation
 - Anticipated competitive response
 - Cost of complementary assets
 - Displacement potential
 - Complexity of technology



Technology readiness level (TRL)



TRL level	Probability of the IPR resulting in revenues
TRL9	80%
TRL8	80%
TRL7	60%
TRL6	50%
TRL5	40%
TRL4	30%
TRL3	20%
TRL2	10%
TRL1	5%

Example DCF: new bicycle

- **Company A** and **Public Research Institute B** do research project for 3 years; aimed results *TRL level 4* (30% chance successful exploitation). They agree: IPR will be transferred to **Company A**
- **Question: What should company A pay to Research Institute B to fully pay for the IPR, i.e. without invoking illegal state support**
- **Company A contributes** 3 times 40k€ in years -3 to -1
- Product **launch** in year 2
- **Market intelligence** (Euromonitor, Nielsen): total market for product in area A: 100M€ in year 2 to 110M€ in year 6



Example: new bicycle

- **Company A market share** from 32% year 2 to 35% year 3. In year 4 competitors respond and share drop to 30% in year 6.
- **Importance IPR in portfolio:** 20% in year 2 to 30% in year 3-6
- **Additional value new IPR:** 40%
- **Profit margin product:** 18%



Value of research project

Project of company A with research institute on new type of bicycle

year						
y-3	€ -40.000,00	company A's investment in collaborative R&D project				
y-2	€ -40.000,00					
y-1	€ -40.000,00					
y0	€ -100.000,00	investment by company A to develop patented technology into new bicycle				
y1	€ -100.000,00					
	market size	market share company A	total share IP protected technology in Company A's portfolio	added value based on specific IP from the project	Company A's sales from bicycle with new IP	profit at 18% margin
y2	€ 100.000.000,00	32%	20%	40%	€ 2.560.000,00	€ 460.800,00
y3	€ 102.500.000,00	35%	20%	40%	€ 2.870.000,00	€ 516.600,00
y4	€ 105.000.000,00	34%	30%	40%	€ 4.284.000,00	€ 771.120,00
y5	€ 107.500.000,00	32%	30%	40%	€ 4.128.000,00	€ 743.040,00
y6	€ 110.000.000,00	30%	30%	40%	€ 3.960.000,00	€ 712.800,00
			total		€ 17.802.000,00	€ 3.204.360,00

Value based on profit and risk factor

NPV @ 8%	€ 2.512.984,10
tax @25%	€ 628.246,03
Profit after tax	€ 1.884.738,08

Market price IP	€ 141.355,36
Total co-investment company y1, y2	€ 120.000,00

% Value research in the total sa

25%

Value research in Euro

€ 471.184,52

TRL level at the end of the the collaborative research project

30%

Value IP adjusted for probability commercial success

€ 141.355,36

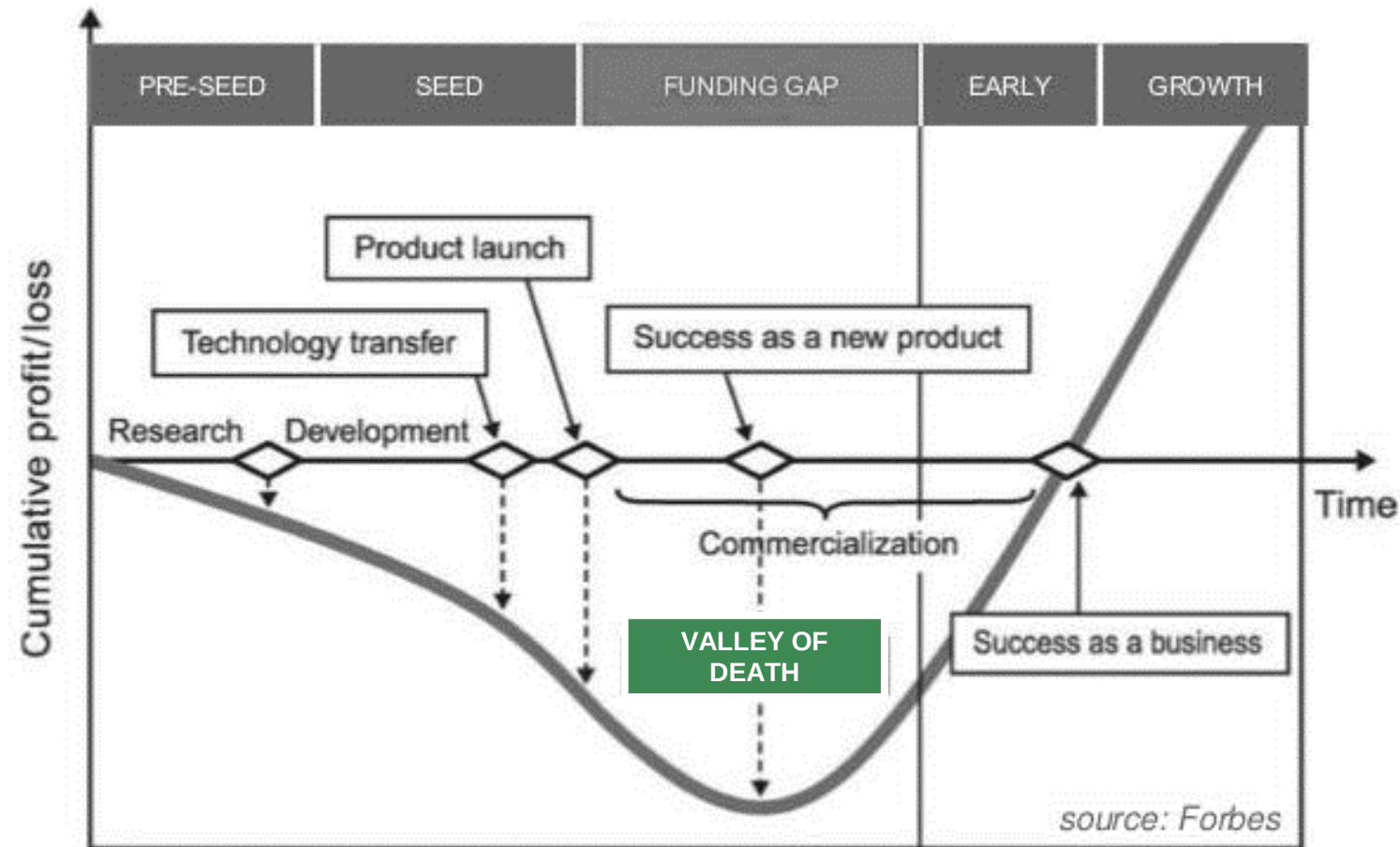
Additional payment to obtain IP ownership by company

€ 21.355,36

Warning for early stage technology and DCF

- First few years require large investments
- Investment in 'hard' euros
- Profit comes only after many years
- Profit in 'soft' euros
- → Results in small if not negative value patent if calculated via DCF

Use common sense



Income approach

Advantage:

- Captures economic features of the IP / takes into account remaining life and risk / can be used when no market data for transactions are available

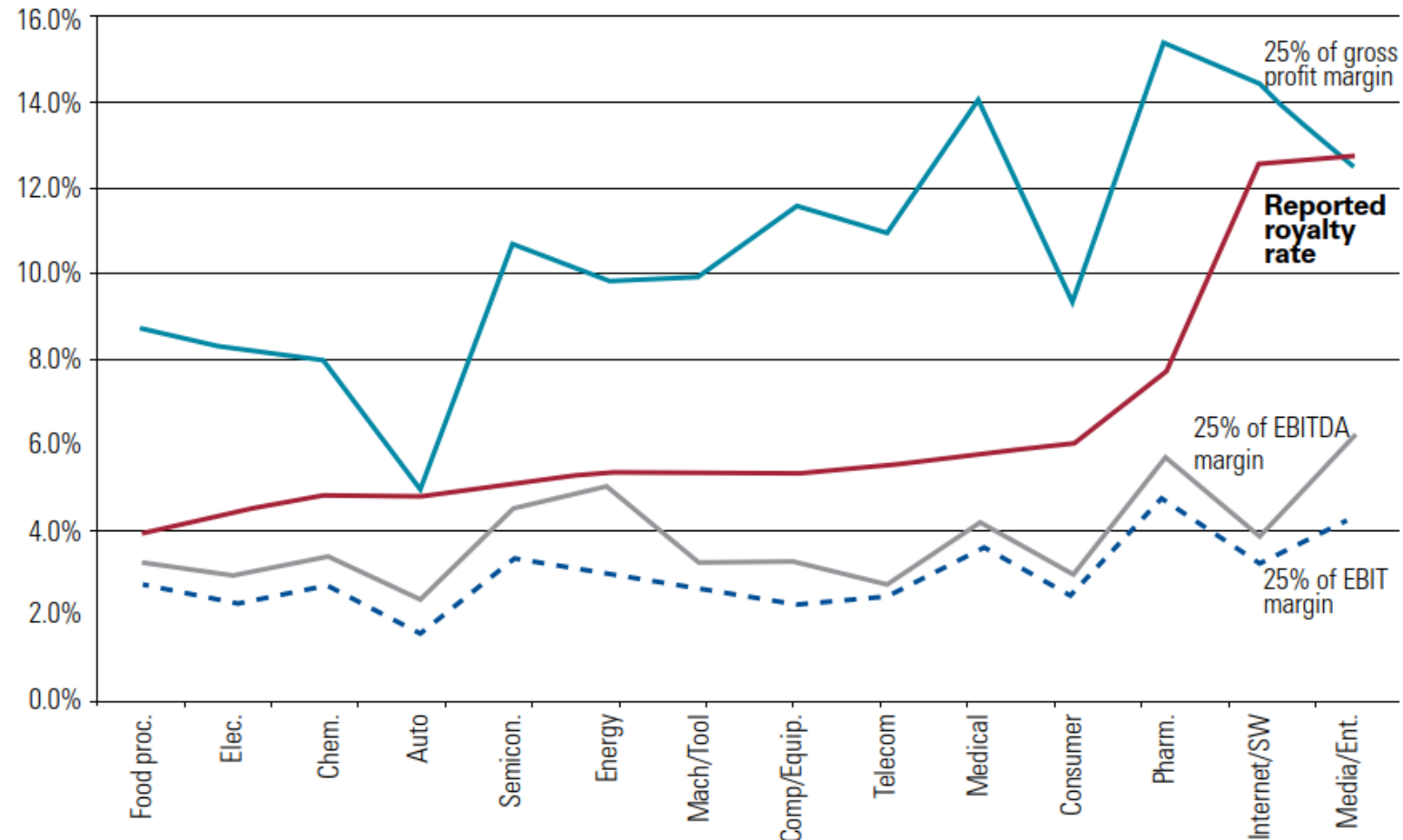
Disadvantage:

- Have to predict future performance / estimate remaining life asset / predict future market share /



KPMG profitability and royalty rates across industries 2012

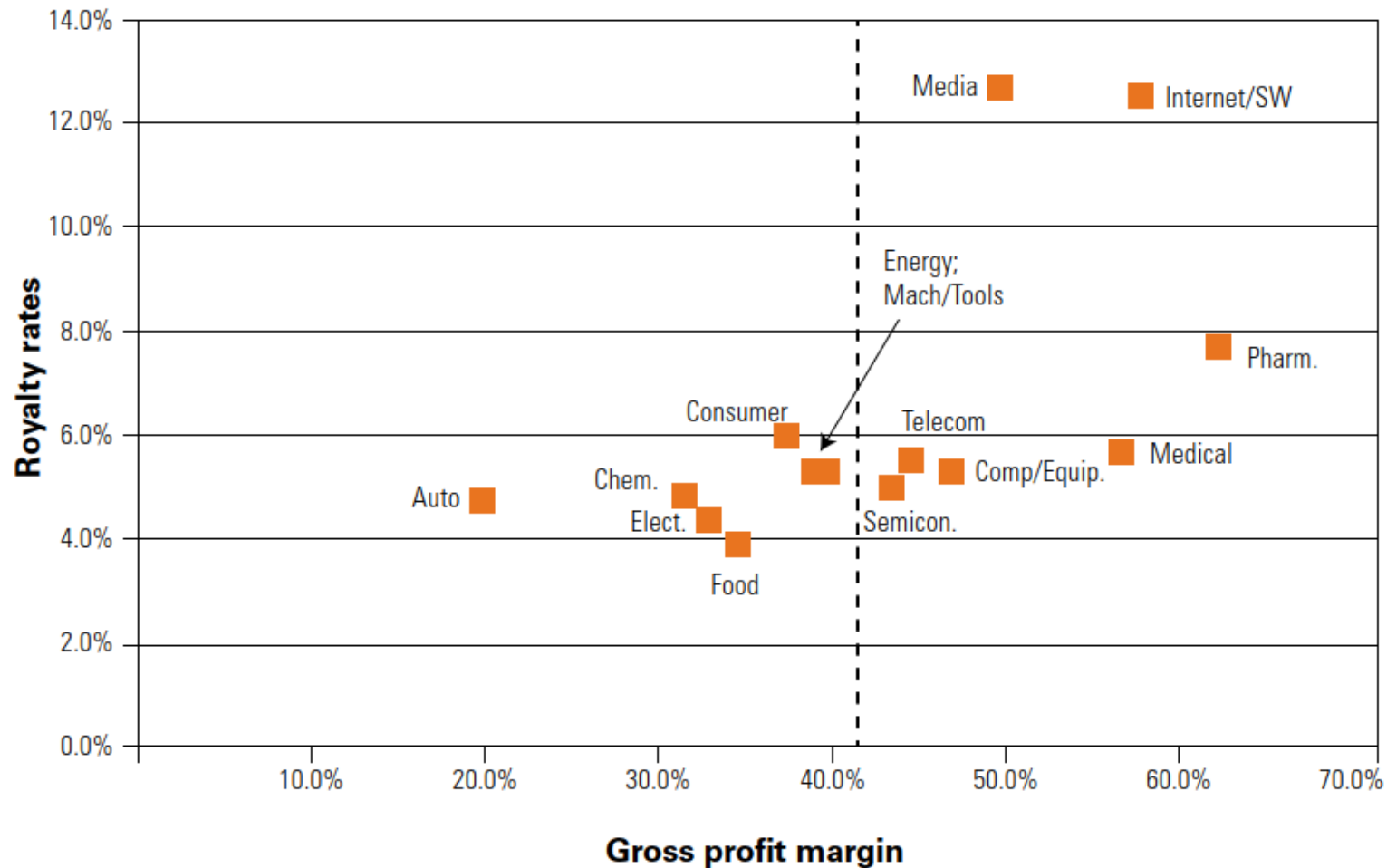
CHART 1: REPORTED ROYALTY RATES VS. RATES FROM THE 25 PERCENT RULE



Sources: RoyaltySources, December 2007 and authors' calculation based on CompuStat Research Insight CD-ROM, December, 2007

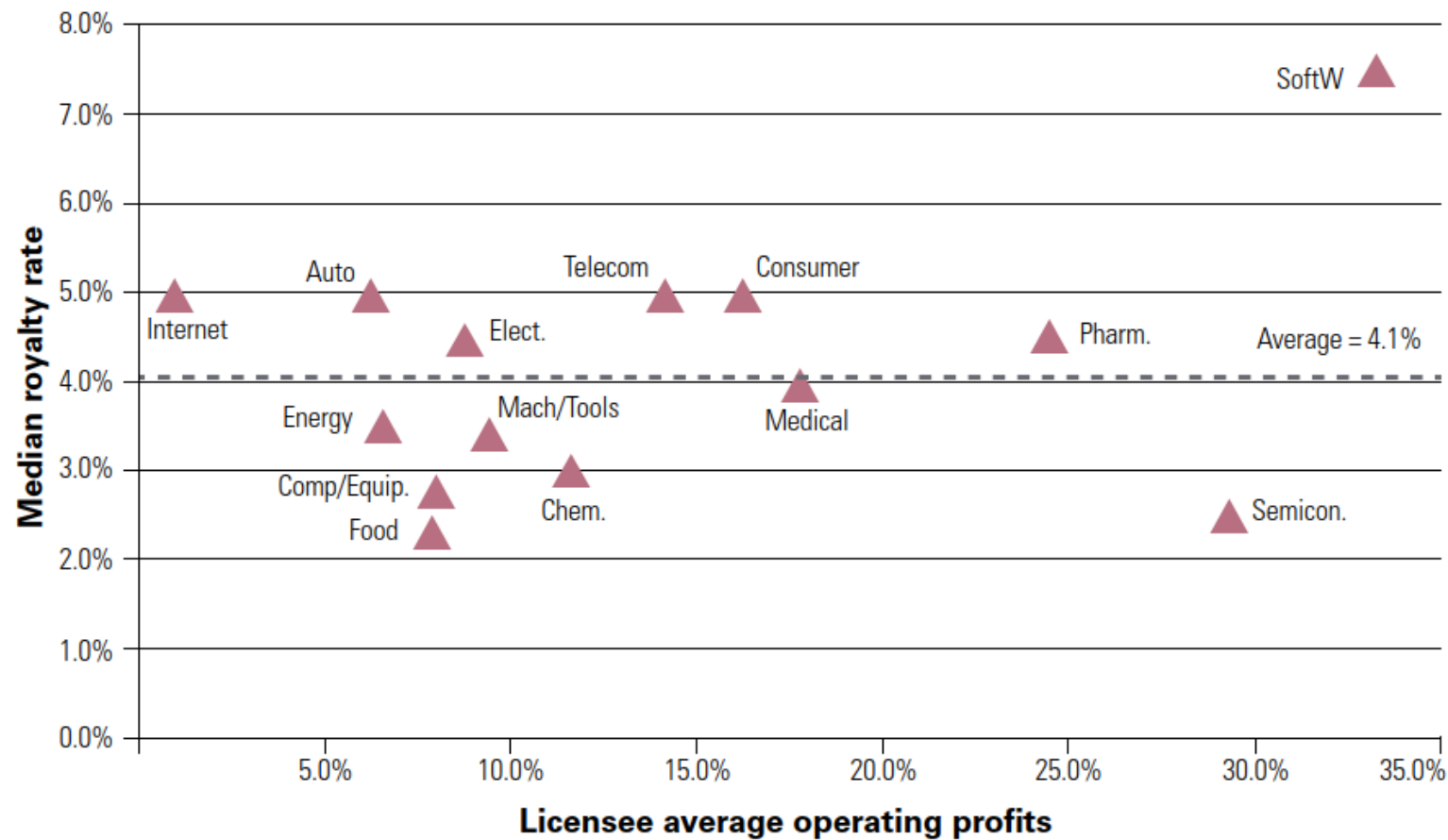
KPMG profitability and royalty rates across industries 2012

CHART 2: 2007 REPORTED ROYALTY RATES AND GROSS PROFIT MARGINS



KPMG profitability and royalty rates across industries 2012

CHART 3: REPORTED MEDIAN ROYALTY RATES AND AVERAGE OPERATING PROFITS



Sources: Goldscheider, et al. (2002)

Summary

- Showing value of IP is important
- Different methods available:
 - Market method
 - Cost method
 - Income method
- Select appropriate valuation method or use combination
- If possible use income method (25% rule)
 - Identify / carve out the cash flow IP generates
 - Estimate risks associated with future product based on Technology readiness level (TRL)



Thank you
for your attention!
Questions?