

Valuation of Technology Start-ups

Everything's New – or is it?

Barbarians on the Net 3

Amsterdam, November 13 - 14, 2000

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Agenda

- **Summary**
 - Nothing Really New, but...

- **The old Toolbox still works**
 - Multiples and DCF
 - Monte Carlo Simulation
 - Decision Tree Analysis

- **Each Approach offers a Different Insight**
 - Multiples, DCF and DTA
 - Case Study Mobile Services
 - Case Study Biotech

- **Valuation links into Due Diligence and Deal Structure**
 - Implication on Due Diligence
 - Implication on Deal Structure

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Nothing Really New, but...

The old toolbox still works

- Multiples and DCFs still “bread and butter”
- Basis for multiples, however, turn more innovative, e.g. “eyeballs” and “stickyness” and might require modifications
- Monte Carlo simulation can improve DCFs
- Real option based approaches, e.g. Decision Tree Analysis (DTA) increasingly useful

Each approach offers a different insight

- Market multiples indicate likely transaction price
- DCF and Monte Carlo tests business logic, and analyzes value drivers and sensitivities
- DTA clarifies decision points and provides model for managerial control
- **Price does not equal value**

Valuation needs to link into due diligence and deal structure

- DCF and Monte Carlo identifies areas of concerns and should direct the due diligence
- DTA provides “hooks” for innovative and flexible deal structures and can help to resolve controversial viewpoints

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Basic Valuation Tools

- **Market Multiples** 

- **Discounted Cash Flows (DCF)** 
 - **Monte Carlo Simulation** 

- **Option-based Valuations**
 - **Decision Tree Analysis (DTA)** 
 - **Real Option Valuation (ROV)** 

“Black-Scholes option pricing...”

“Compound rainbows with multiple discrete and time dependent uncertainties...”

Most Common Approaches

Market Multiples

- **Traditional**
 - Sales
 - EBITDA
- **Recent**
 - “Modified” EBITDA
 - Customers
 - Repeat visitors
- **“Daring ones”**
 - Eyeballs
 - Stickiness

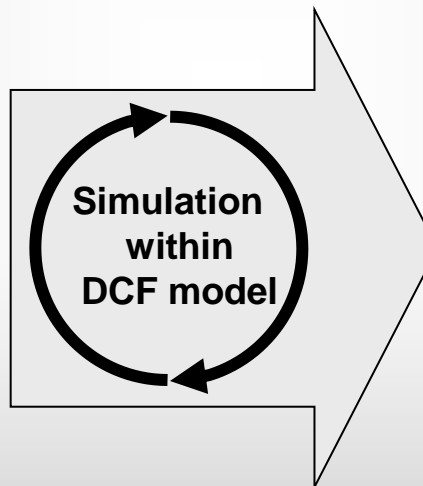
Discounted Cash Flow

- **Financial projections**
 - Operating business
 - Investments
- **Estimated cost of capital**
 - Risk
 - Financing mix
 - Market condition
- **Sensitivity / scenario analysis**
 - Discrete scenarios
 - Monte Carlo simulation

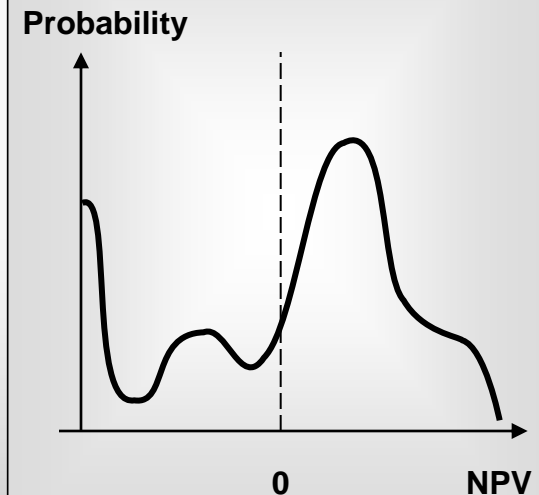
Monte Carlo Simulation

Probability distribution of key parameters

- **Technology**
 - will work 80%
 - will not work 20%
- **Market entry**
 - 1 or 2 Q 20%
 - 3 or 4 Q 50%
 - Later 30%
- **Competitors**
 - None 10%
 - One or more 90%



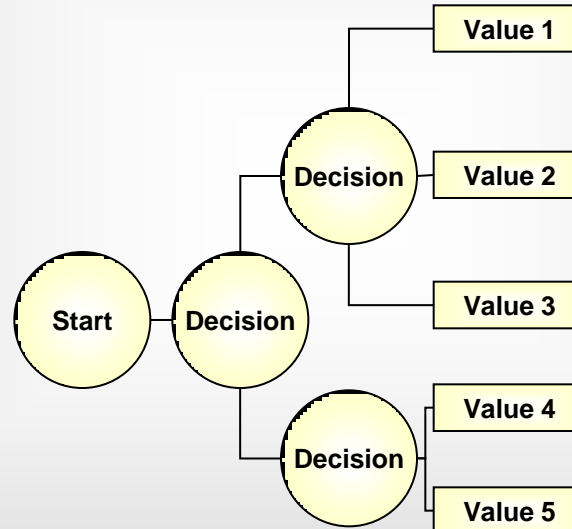
Probability distribution of expected outcomes



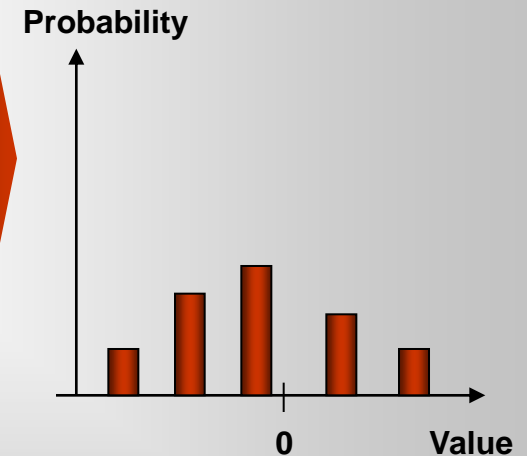
Decision Tree Analysis

Required input

- Major decision points
- Outcome probabilities at each decision point
- Time and cost between decision points
- Expected value at end of each branch
- **ABILITY AND WILLINGNESS TO MAKE DECISIONS**



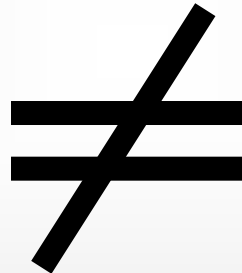
Expected Value



Value Differs from Price

Value drivers

- **Target market**
 - Size, growth
 - Profitability
- **Competitive position**
 - Technology
 - Market
 - Management
- **Projected cash flow**
- **“Objective” risk**



Price drivers

- **Value driver**
- **Market sentiment**
 - Macro
 - Micro
- **“Strategic” consideration**
 - Real
 - Perceived
- **Portfolio requirements**
- **“Subjective” risk**

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Valuation Insights

Multiples

- Likely market price – *but your price?*
- Investor's appetite – *but your appetite?*
- “State of the market” – *but your “State of mind?”*

DCF

- Economic logic behind valuation
- Identification of value drivers
- Sensitivity/scenario analysis

DTA

- Identification/assessment of decision points
- Model for managerial control
- "Hooks" for innovative deal structures

Mobile Services – The Case

Target

- **New entrant in mobile service provider market**
- **Attractive product and service offerings**
- **Highly experienced management team**

Market

- **Rapidly growing market, but declining role of service providers**
- **Rapidly declining prices and margins**
- **Three major player dominating the market**

Competition

- **At least seven competitive ahead of target**
- **Continuing consolidation expected**

Mobile Services – Multiples vs. DCF

Market multiples

- **Analysis of recent comparable transactions**
 - Price per customer
 - Price per customer in related services
 - Price per potential customer

100

DCF

- **Projected customer growth**
- **ARPU based on leading competitors**
- **Stable margins**
- **Decreasing operating expenses**
- **Projected investments**

60

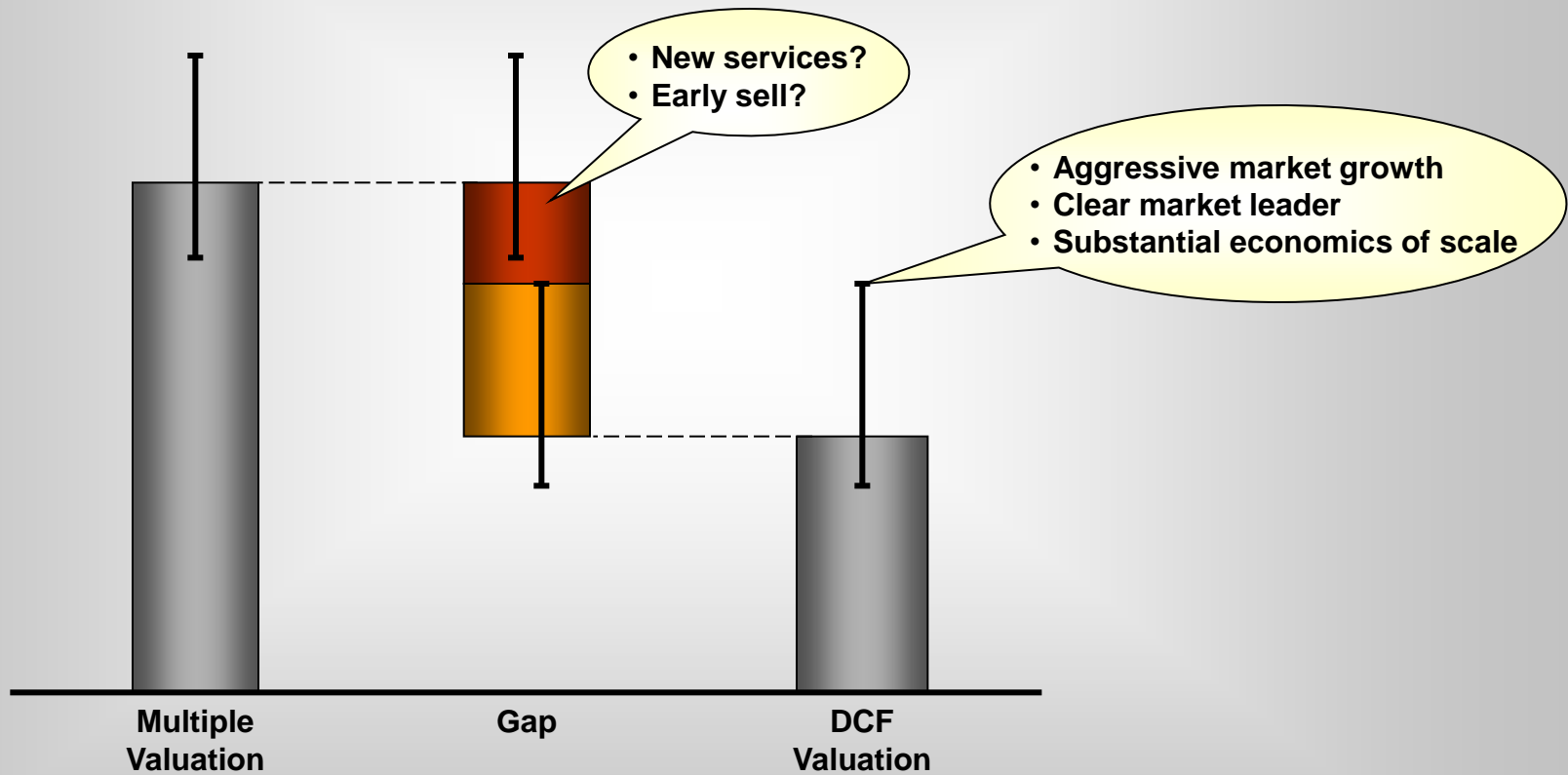


"DCF Backed" Customer Value

Revenue source	Units	Estimated over time			NPV	Assumptions
		Price/Unit	EBITDA			
<ul style="list-style-type: none"> • Mobile services - Voice - Data - . - . - . 	100 210	100 65	18% 7%	157	steady, volume growth, declaiming margins	
<ul style="list-style-type: none"> • Cross selling - Fixed - Internet - . - . - . 						
<ul style="list-style-type: none"> • Advertisement 						
<ul style="list-style-type: none"> • New applications 						

Σ Customer Value

Mobile Services – The Gap



Biotech – The Case

Target

- **CFTR-gene therapy for fibrosis at start of phase I**
- **Expected efficacy, safety and convenience promising**
- **Competitive bid with other financial and strategic investors**

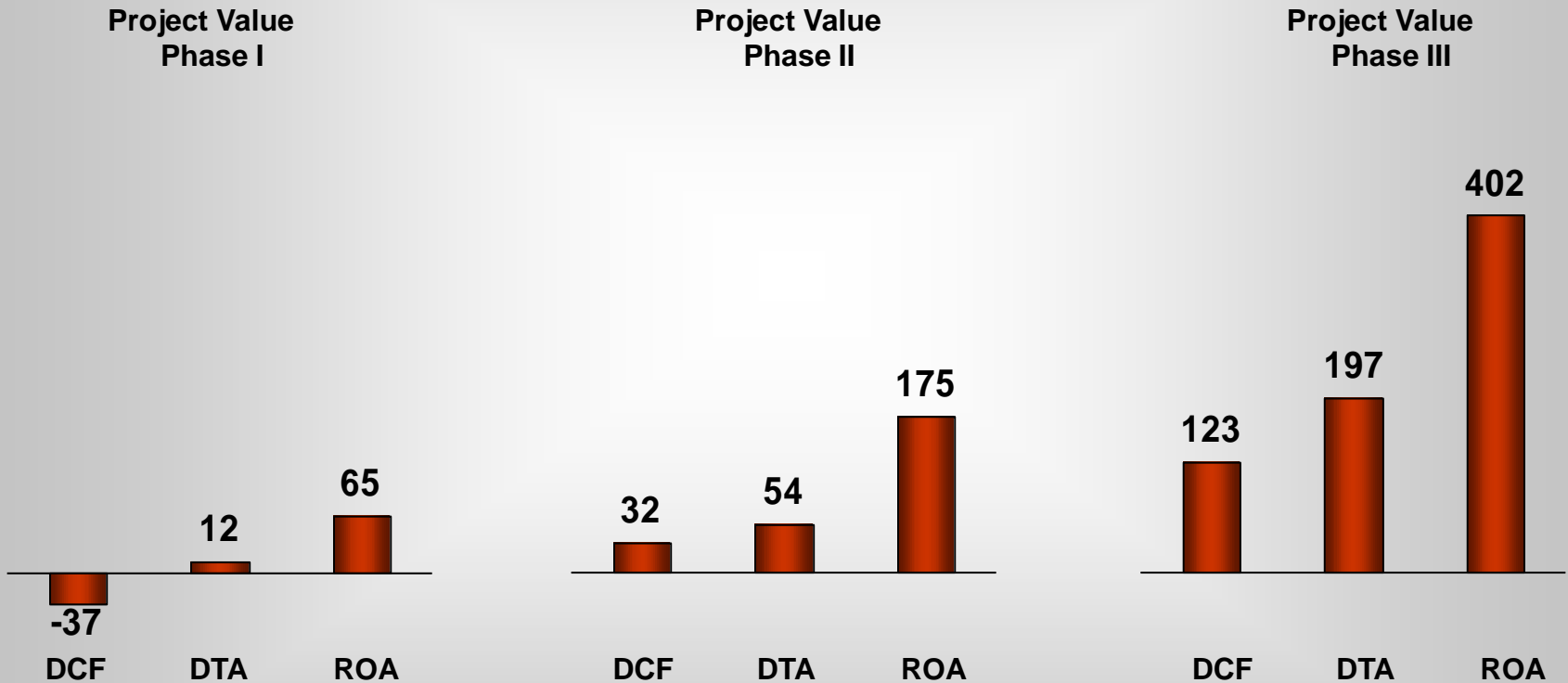
Market

- **Prevalence in U.S.: 30,000 patients**
- **Incidence in U.S.: 1,500 patients/year**
- **Benefit: increase life expectancy from 20 to 30 years**

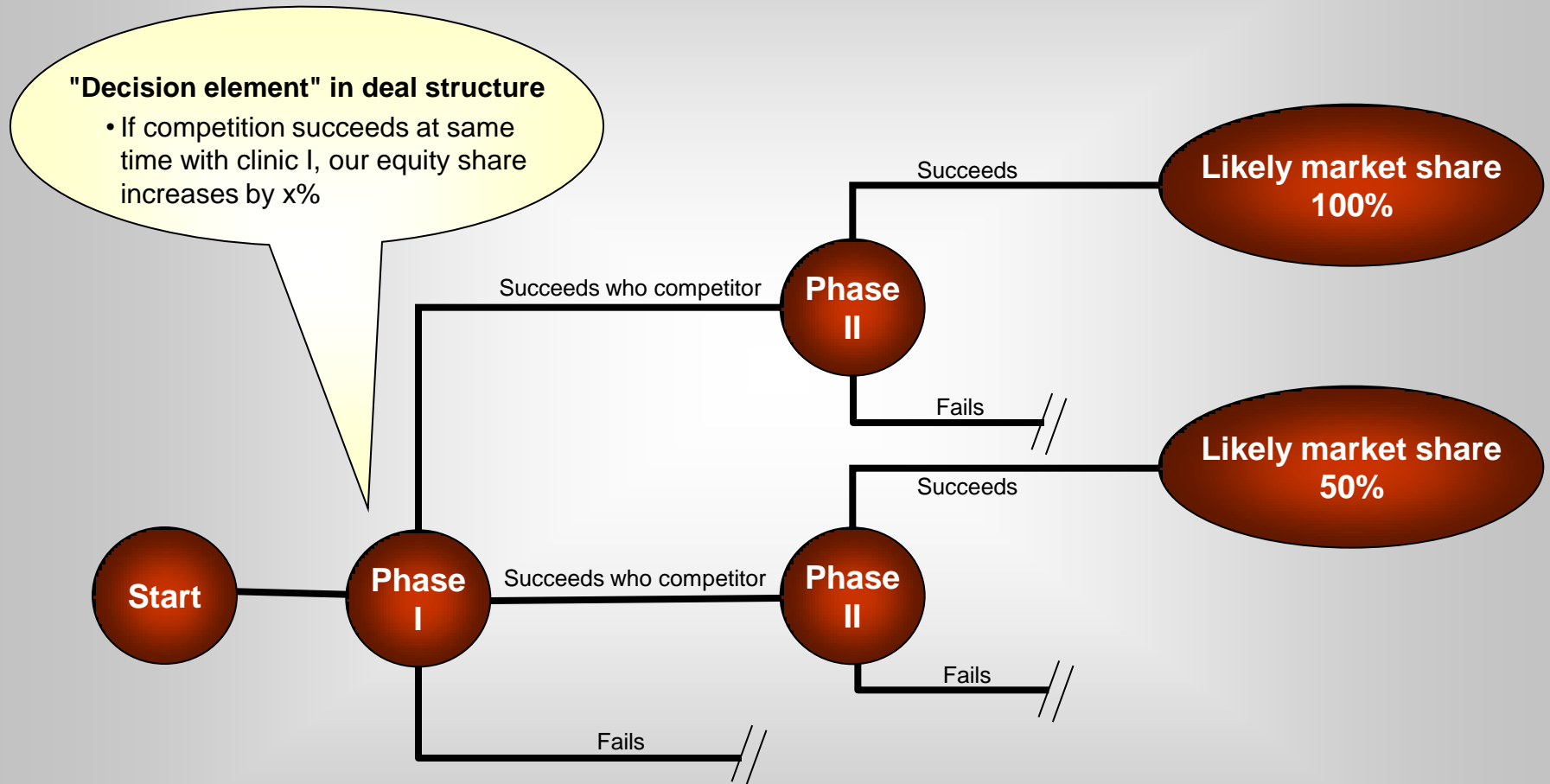
Competition

- **Four other companies with gene therapy in preclinic or phase I**

Biotech – DCF vs. DTA vs. ROV



Biotech – Deal Structure



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Implications for Due Diligence

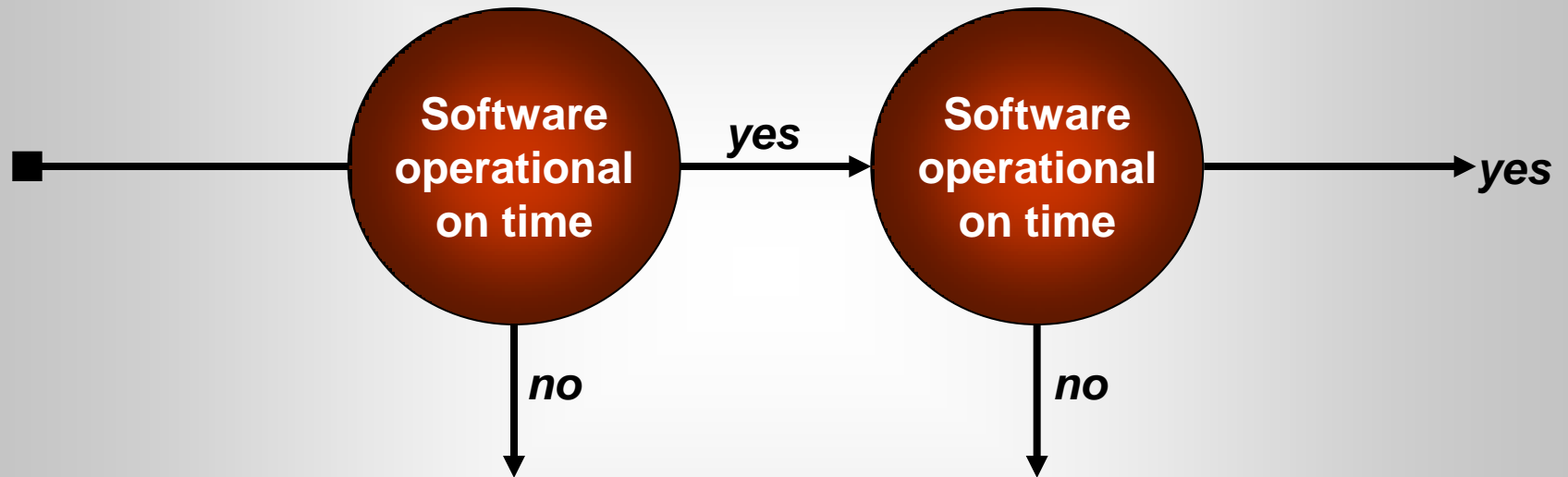
Issues raised through valuation

- **Market dynamics**
- **Technological competitiveness**
- **Time to market**
 -
 -
 -

Due Diligence

- **Financial** 
- **Legal** 
- **Market/Competitive** 
- **Management** 
 -
 -
 -

Implication for Deal Structure



Initial investment:

€/Mio. for
25% equity

Equity Kicker I:

additional
10% equity

Equity Kicker II:

additional
5% equity

Contact Details

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