NEW CHALLENGES IN BUSINESS VALUATION

BUSINESS VALUATION AND BANKRUPTCY

Mauro Bini

Agenda

1. Business Life Cycle and Valuation
2. High Yield Debtors: probability of default, turnaround potential EV, discrete assets liquidation
3. Underperformance, Stress and Distress
4. Declining Business: situation analysisand reference points
5. Critical issues in valuation of distressed firms

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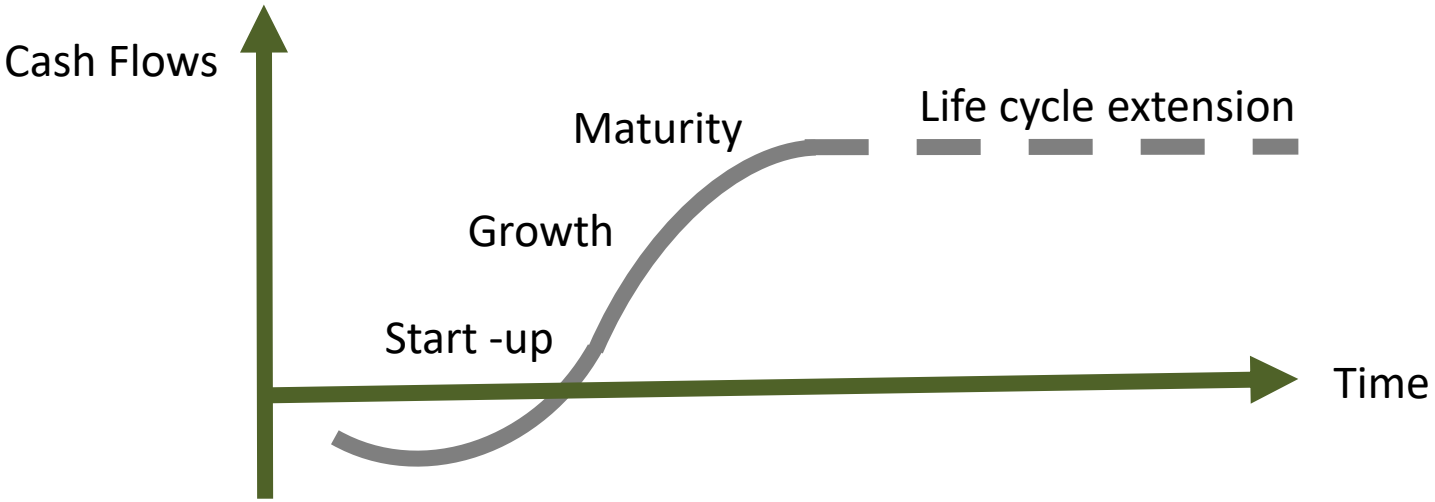
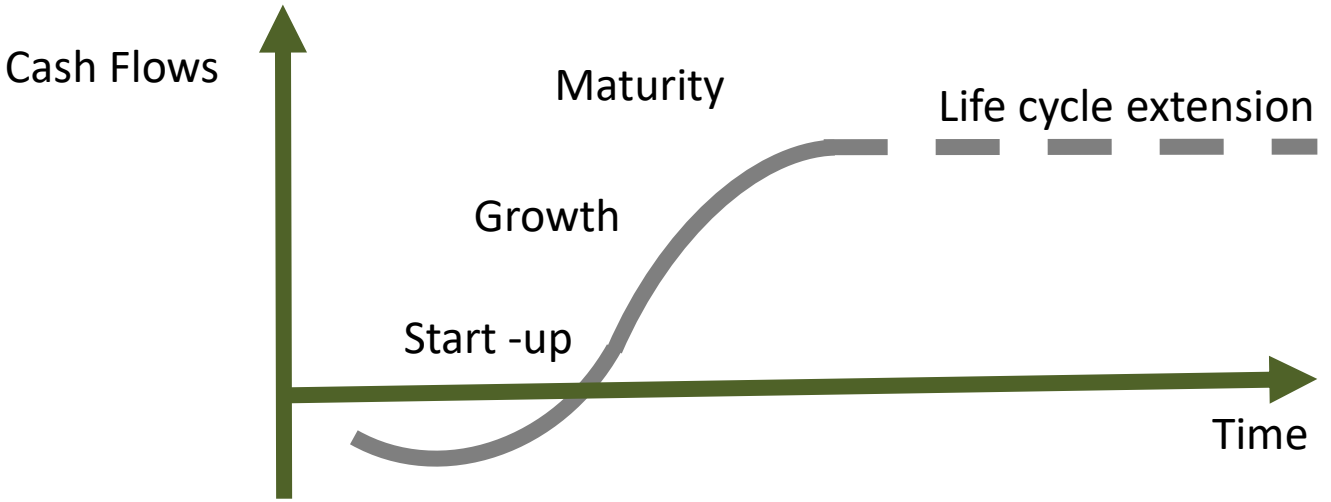
Business Life Cycle and Valuation



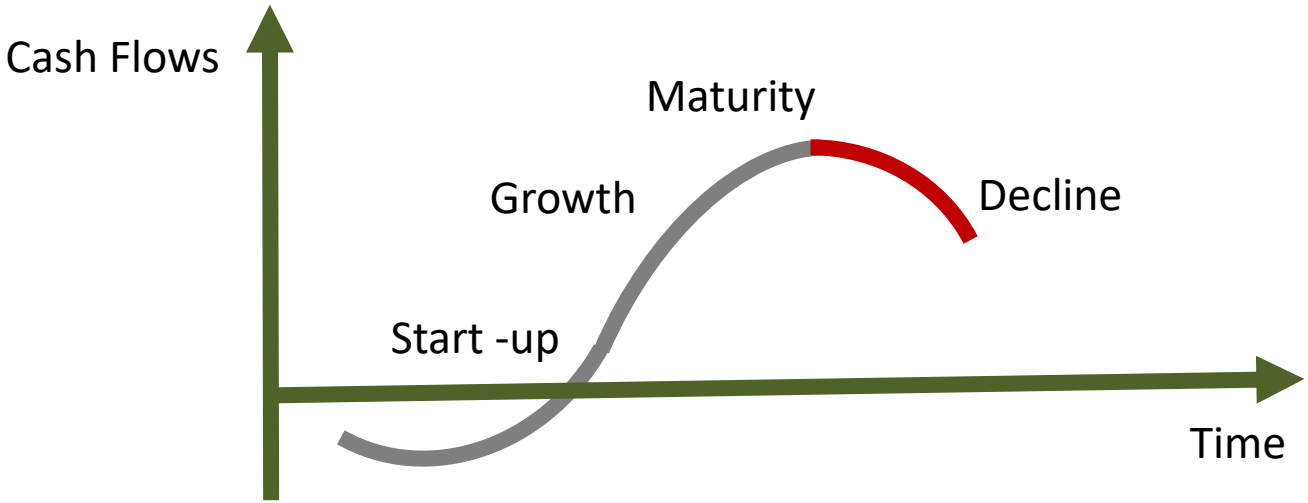
Business Life Cycle and Valuation



Implicit assumptions:

- Business model sustainability;
- Indefinite life
- Target leverage ratio
- Normalized capex and cash flows beyond the esplicit forecast period
- Cost of capital (sistematic risk)

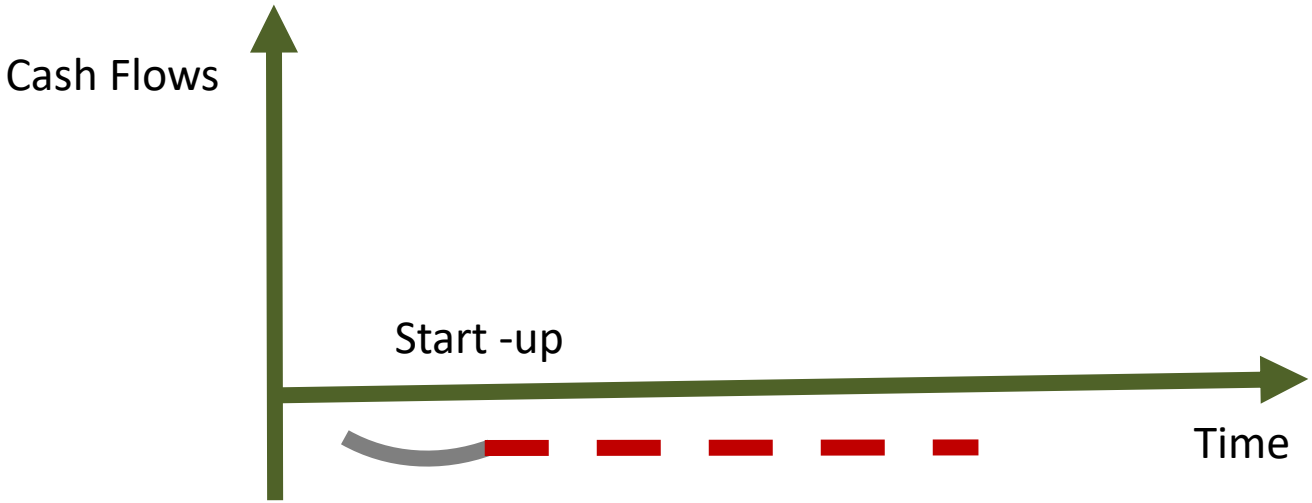
Business Life Cycle: There is Also the Decline



Implicit assumptions:

- L ness m l su ty;
- In life
- Tar lev ratio
- Nor ed cape d cas s bey e es fo s
- C of tal (ema risk)

Business Life Cycle: There is Also the Early Death (disruption)



Implicit assumptions:

- L ness m l su ty;
- In life
- Tar lev ratio
- Nor ed cape d cas s bey e es fo s
- C of tal (ema risk)

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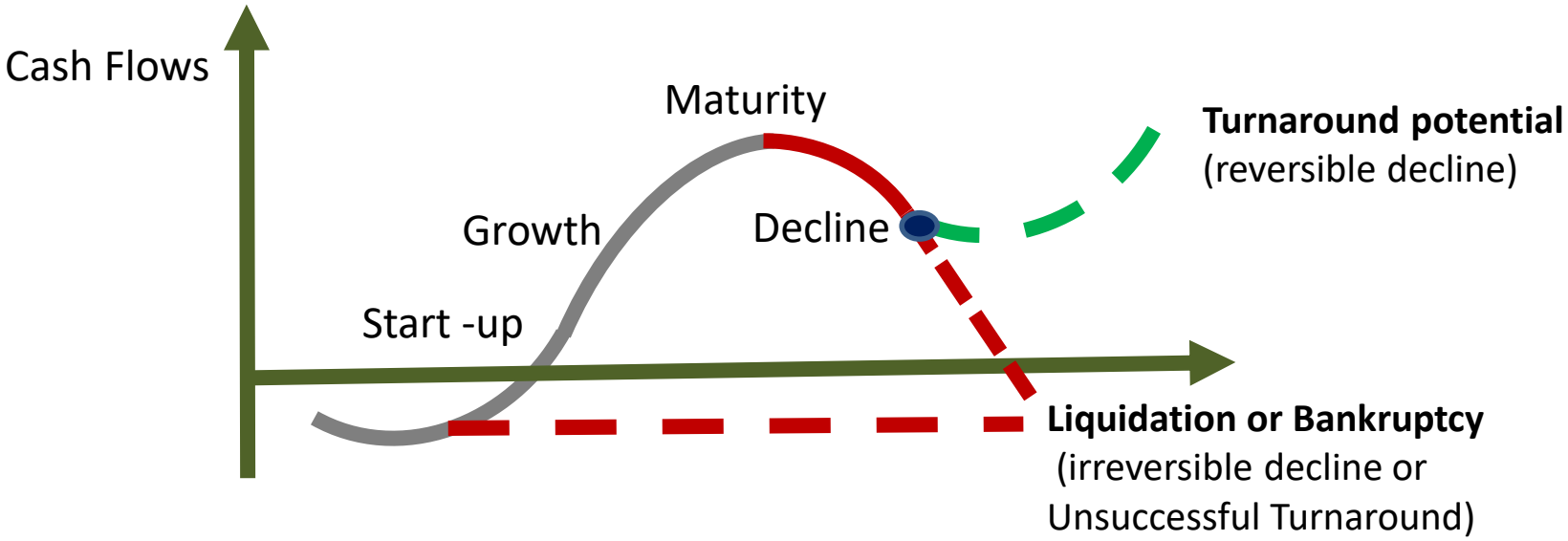
Business Life Cycle: Turnaround Potential or Liquidation/Bankruptcy



Take-Aways

- ✓ Declining businesses have two possible outcomes: going concern and gone concern. We cannot adopt just one premise of value: going concern or gone concern.
- ✓ Valuing a declining business using nothing but «going concern» perspective is equivalent to overvalue the business

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High Yield Issuers and Probability of Default

Average Cumulative Default Rate for Corporates by region (1981-2018)

	EUROPE (%)	Years						
	Rating	1	2	3	4	5	6	7
INVESTMENT GRADE	BBB	0,07	0,2	0,33	0,46	0,56	0,76	0,95
SPECULATIVE GRADE	BB	0,35	1,15	1,94	2,67	3,71	4,62	5,49
High Yield	B	2,14	5,38	**8,3**	**10,56**	**12,43**	13,69	14,49
	CCC/C	25,47	34,02	**37,93**	**41,52**	**43,37**	43,37	44,23

Source: S&P Global 2018 Annual Global Corporate Default and Rating Transition Study. April, 9, 2019 table 25 page 59

High Yield Issuers and Transition rates

Global Corporate Average Transition Rates (1981-2018) (%)

	AAA	AA	A	BBB	BB	B	CCC/C	D	NR (^)	Upgrade	Downgrade	Upgrade/ Downgrade
3 years												
BBB	0,02	0,27	8,31	**65,13**	7,01	1,57	0,28	0,84	16,58	8,60	9,70	0,9
BB	0,01	0,05	0,48	10,99	**47,56**	11,40	1,22	3,78	24,50	11,53	16,40	0,7
High Yield **B**	0,00	0,03	0,19	0,73	10,01	**41,60**	4,68	12,34	30,42	10,96	17,02	0,6
High Yield **CCC/CC**	0,00	0,00	0,13	0,61	1,59	17,28	**10,15**	40,99	29,30	19,61	40,99	0,5
5 years												
BBB	0,02	0,42	10,48	**52,12**	7,58	2,14	0,38	1,76	25,09	10,92	11,86	0,9
BB	0,00	0,08	0,98	12,68	**32,02**	11,00	1,20	7,29	34,74	13,74	19,49	
High Yield **B**	0,01	0,03	0,24	1,50	10,30	**25,35**	2,93	18,33	41,32	12,08	21,26	0,6
High Yield **CCC/CC**	0,00	0,00	0,11	0,68	2,81	12,41	**2,49**	45,85	35,58	16,07	45,85	0,4

(^) no rating

Source: S&P Global 2018 Annual Global Corporate Default and rating Transition Study. April, 9, 2019, table 21 and 22 page 53 and 54

High Yield Issuers and Time to Default

Time to default From Original Rating For Global Corporate Defaulters (1981-2018)

	Original rating	N. default	Average years from original rating	Median years from original rating	Standard Deviation of years from original rating	Coefficient of variation
INVESTMENT GRADE	BBB	208	8,8	7,1	6,5	0,739
SPECULATIVE GRADE	BB	613	6,8	5,2	5,5	0,809
High Yield	B	1.523	**4,9**	**3,6**	4,1	**0,837**
	CCC/C	274	**2,3**	**1,3**	2,9	**1,261**

Source: S&P Global 2018 Annual Global Corporate Default and rating Transition Study. April, 9, 2019 table 10 page 36

Turnaround potential Enterprise Value: going concern

Turnaround potential EV = **Continuing EBITDA @ default** × **EBITDA multiple (discounted)**

(+ Interest expenses
+ Principal amortizations (capped @5%)
+ Minimum level of capex) X (1+ cyclicality adjustment)

Cyclicality	Adj.
LOW	**0%**
INTERMEDIATE	**5%**
MODERATE	**10%**
HIGH	**15%**

Turnaround potential: multiples (discounted)

EV/EBITDA MULTIPLES

Industry	Discounted multiples LTM to march 2015 (	Discount to S&P Capital IQ 15-year LTM to March 2015 (%)	S&P Capital IQ 15-year LTM to march 2015
Aerospace and defence	5.0	42	8.6
Agribusiness and commodity food	5.0	39	8.2
Auto OEM	5.5	36	8.6
Auto suppliers	5.0	21	6.3
Branded nondurables	6.0	30	8.6
Building materials	5.0	33	7.5
Business and consumer services	5.5	37	8.7
Capital goods	5.0	41	8.5
Commodity chemicals	5.0	29	7.0
Consumer durables	5.0	39	8.2
Containers and packaging	5.0	29	7.0
Engineering and costruction	5.0	26	6.8
Environmental services	6.0	36	9.4
Forest and paper products	5.0	36	7.8

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Turnaround potential: multiples (discounted)

Industry	Discounted multiples LTM to march 2015 (	Discount to S&P Capital IQ 15-year LTM to March 2015 (%)	S&P Capital IQ 15-year LTM to march 2015
Health care equipment	6.0	52	12.5
Health care services	5.5	41	9.3
Leisure and sports	6.5	33	9.7
Media and entertainment	6.5	34	9.9
Metals and mining downstream	5.5	36	8.6
Metals and mining upstream	5.0	42	8.6
Midstream energy	6.5	40	10.9
Oil and gas drilling equipment and services	5.5	39	9.0
Pharmaceutical	6.5	47	12.2
Railroads and package express	5.5	36	8.6
Retail and restaurants	5.0	39	8.2
Specialty chemicals	5.5	34	8.3
Technology-hardware and semicondu	6.0	42	10.3
Technology-software and services	6.5	44	11.7
Telecom and cable	6.0	38	9.6
Transportation cyclical	5.0	21	6.3

Source: S&P-Recovery rating criteria for speculative-grade corporate issuers, may 18, 2018 table 1

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Liquidation: gone concern (discrete assets valuation haircuts)

Sector	Category	Shrinkage/depreciation (%)	Realization (%)	Min Haircut (%)
	Working capital			
All	Cash	80-100	100	0
All	Accounts receivable	Consistent with expected contraction on path to default	55-85	15
All	Inventories -raw materials	Consistent with expected contraction on path to default	35-85	15
All	Inventories -work in progress	Consistent with expected contraction on path to default	0-55	45
All	Inventories - finished goods	Consistent with expected contraction on path to default	45-65	35
All	**Fixed assets**			
All	General Intangibles	0%	0-70	30
All	Buildings	2-5 per year	40-60	40
All	Land	0%	85 of FMV	15 of FMV
All	Furniture & Fixture	10 per year	0-10	90
All	Machinery & Equipment	4-10 per year	35-55	45
All	Rental equipment	5-10 per year	50-85	15

Source: S&P-Recovery rating criteria for speculative-grade corporate issuers, may 18, 2018 tab. 5, 13 e 14 pp.. 4, 10 e 11

Take-Aways

- ✓ Time to default for High yield issuers (B and below)= 2 -5 years;
- ✓ 3 out of 4 «B rated» issuera change the rating in 5 years (w/higher probability of downgrade); 97 out of 100 «CCC/CC rated» issuers change the rating in 5 years (w/higher probability of downgrade);
- ✓ Turnaround potential EV is calculated using EV/Ebitda multiples in a range of 5x- 6.5x and a Continuing Ebitda @ default
- ✓ Haircuts in discrete asset liquidation are assets specific

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Examples of underperformance, stress and distress

- The following slides contains illustrative examples based on the following semplyfing assumptions:

- ❑ The firm has only one fixed asset;
- ❑ The firm has finite life (= Life of the fixed asset = 4 years)
- ❑ NWC = 0;
- ❑ no taxes;
- ❑ Gearing ratio of the firm = Loan-to-Value Ratio of the asset
- ❑ EBITDA = UFCF;
- ❑ FCFE = UFCF – debt instalment
- ❑ Original cost of the asset = reproduction cost;
- ❑ Current value of the asset = replacement cost

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Underperformance
ROIC < cost of capital

years	0	1	2	3	4
Invested capital (BoP)	100	100	75	50	25
Ebitda (=UFCF)		16,8	16,4	15,9	15,5
Depreciation		25	25	25	25
EBIT		-8,2	-8,65	-9,1	-9,6
ROIC = EBIT/Invested capital		-8,2%	-11,5%	-18,2%	-38,2%
wacc	6%				
Discount factor		0,943	0,890	0,840	0,792
PV UFCF		15,8	14,6	13,3	12,2
Enterprise Value	56,0				
Value destruction	44,0	(=EV - IC)			
Loan-to value	40%				
Net debt	40				
Book value of equity	60	(=IC - Net debt)			
Equity value	16,0	(= EV - Net debt)			

IC = original cost = reproduction cost

Underperformance
ROIC < cost of capital

		0	1	2	3	4
Ebitda =UFCF			16,8	16,4	15,9	15,5
Ebit			-8,2	-8,65	-9,1	-9,55
cost of debt		4%				
Net debt principal (BoP)			40	30	20	10
Interest expenses			-1,6	-1,2	-0,8	-0,4
Net Income (LOSSES)			-9,8	-9,9	-9,9	-10,0
FCFE = UFCF - debt instalment			5,2	5,2	5,1	5,1
Cost of equity	10,90%					
Discount factor			0,902	0,813	0,733	0,661
PV FCFE			4,7	4,2	3,7	3,3
Equity value		16,0				

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Underperformance EV > Replacement cost

Assuming write off of the assets = 50

years	0	1	2	3	4
Replacement cost (BoP)		50	37,5	25	12,5
Ebitda (=UFCF)		16,8	16,35	15,9	15,45
Depreciation		12,5	12,5	12,5	12,5
EBIT		4,3	3,85	3,4	2,95
ROIC = EBIT/replacement cost		8,6%	10,3%	13,6%	23,6%
wacc	6%				
Discount factor		0,943	0,890	0,840	0,792
PV UFCF		15,8	14,6	13,3	12,2
Enterprise Value	56,0 > replacement cost				

Assumption: replacement cost = 50

Replacement cost =50; write off assets = 50

years	0	1	2	3	4
Ebitda =UFCF		16,8	16,4	15,9	15,5
Ebit		4,3	3,85	3,4	2,95
cost of debt	4%				
Net debt principal (BoP)		40	30	20	10
Interest expenses		-1,6	-1,2	-0,8	-0,4
Net Income (NO LOSSES)		2,7	2,7	2,6	2,6
FCFE = UFCF - debt instalment		5,2	5,2	5,1	5,1
Cost of equity	10,90%				
Discount factor		0,902	0,813	0,733	0,661
PV FCFE		4,7	4,2	3,7	3,3
Equity value	16,0				
Sum FCFE (= liquidation value)					20,5
Book value of equity	10,0	12,7	15,4	18,0	20,5

Replacement cost = 50; new cycle of investment of the investments at the end of the year 4

years	0	1	2	3	4	end of year 4
Sum FCFE (= liquidation value)					20,5	
Book value of equity	10,0	12,7	15,4	18,0	20,5	
					Enterprise Value	56,0
					Replacement cost	50
					NPV = (EV - replacement cost)	6
					Loan to replacement cost	40%
					New debt	24,0
					Book value of equity = sum FCFE	20,5
					New equity	5,5
					Total Equity	26
					NPV on Total equity	23%

Stress = EV < Replacement cost

years	0	1	2	3	4
Replacement cost (BoP)		60	45	30	15
Ebitda (=UFCF)		16,8	16,35	15,9	15,45
Depreciation		15	15	15	15
EBIT		1,8	1,35	0,9	0,45
ROIC = EBIT/replacement cost		3,0%	3,0%	3,0%	3,0%
wacc	6%				
Discount factor		0,943	0,890	0,840	0,792
PV UFCF		15,8	14,6	13,3	12,2
Enterprise Value	56,0	< replacement cost			
Loan-to value	40%				
Net debt	40				
Book value of equity	60	(=IC - Net debt)			
Equity value	16,0	(= EV - Net debt)			

New assumption: replacement cost = 60

Stress = EV < Replacement cost

years	0	1	2	3	4
Replacement cost (BoP)		60	45	30	15
Ebitda (=UFCF)		16,8	16,35	15,9	15,45
Depreciation		15	15	15	15
EBIT		1,8	1,35	0,9	0,45
ROIC = EBIT/replacement cost		3,0%	3,0%	3,0%	3,0%
wacc	6%				
Discount factor		0,943	0,890	0,840	0,792
PV UFCF		15,8	14,6	13,3	12,2
Enterprise Value	56,0	< replacement cost			
Loan-to value	40%				
Net debt	40				
Book value of equity	60	(=IC - Net debt)			
Equity value	16,0	(= EV - Net debt)			

New assumption: replacement cost = 60

NPV < 0

Distress = Net financial debt >EV < Replacement cost

years	0	1	2	3	4
Invested capital (BoP)	100	100	75	50	25
Ebitda (=UFCF)		20,0	18,8	17,5	16,3
Depreciation		25	25	25	25
EBIT		-5	-6,25	-7,5	-8,8
ROIC = EBIT/Invested capital		-5,0%	-8,3%	-15,0%	-35,0%
wacc	6%				
Discount factor		0,943	0,890	0,840	0,792
PV UFCF		18,9	16,7	14,7	12,9
Enterprise Value	63,1	< Net debt; > Replacement cost			
Value destruction	36,9				
Loan-to value	70%				
Net debt	70				
Book value of equity	60	(=IC - Net debt)			
Equity value	-6,9	(= EV - Net debt)			

New assumptions: replacement cost = 60
Original LTV = 70%

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Stress and distress EV < replacement cost and face value of debt

years	0	1	2	3	4
Invested capital (BoP)	100	100	75	50	25
Ebitda (=UFCF)		18,0	16,8	15,5	14,3
Depreciation		25	25	25	25
EBIT		-7	-8,2	-9,5	-10,7
ROIC = EBIT/Invested capital		-7,0%	-10,9%	-19,0%	-42,8%
wacc	6%				
Discount factor		0,943	0,890	0,840	0,792
PV UFCF		17,0	15,0	13,0	11,3
Enterprise Value	56,3	< Net debt; < Replacement cost			
Value destruction	43,7				
Loan-to value	70%				
Net debt	70				
Book value of equity	60	(=IC - Net debt)			
Equity value	-13,7	(= EV - Net debt)			

New assumptions: replacement cost = 60
Original LTV = 70%

Take-aways

- ✓ The accounting performances (= profitability rates =ROIC) of a declining business are function of the write-offs of the assets (and the write offs are function of the recoverable value of the assets: i.e. replacement cost).
- ✓ If the ROIC on Invested Capital at reproduction cost is lower than the cost of capital, the company is underperforming (no stress)
- ✓ If the ROIC on Invested Capital at replacement cost is lower than the cost of capital (i.e. EV < $IC_{\text{replacement cost}}$), the company won't be able to replace the assets at the end of their life (stress)
- ✓ If EV is lower than face value of the debt the company is distressed

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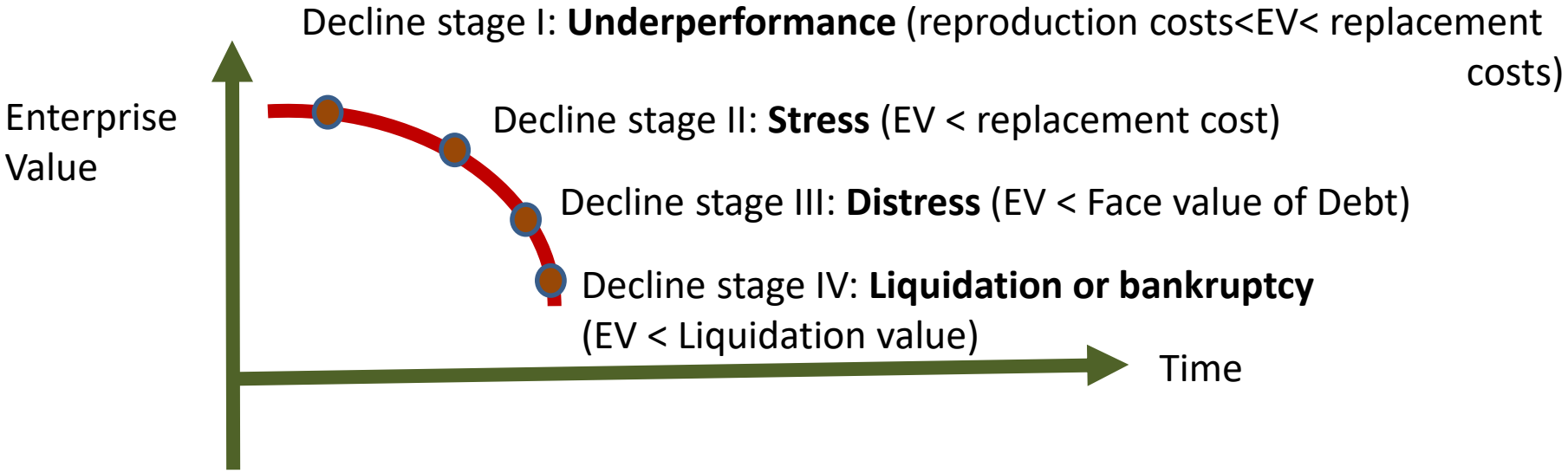
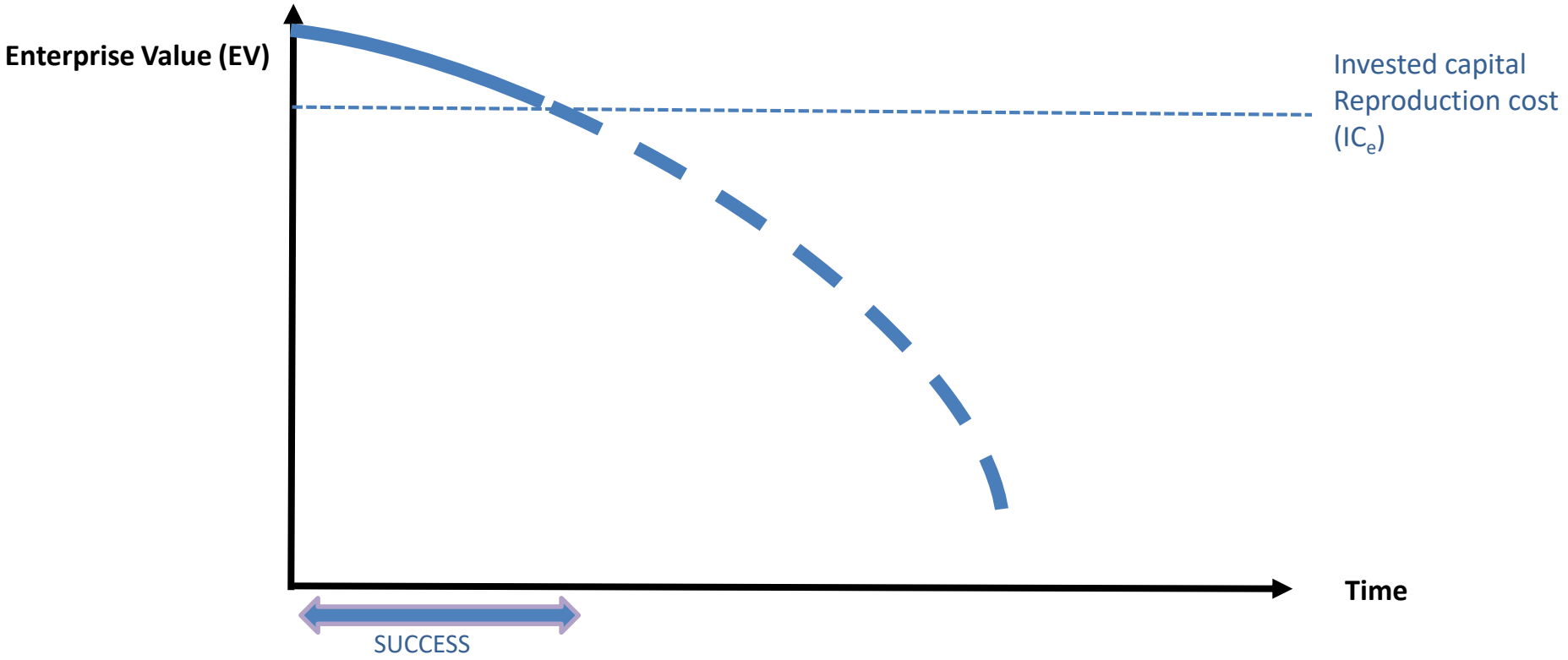
Situation analysis and reference points



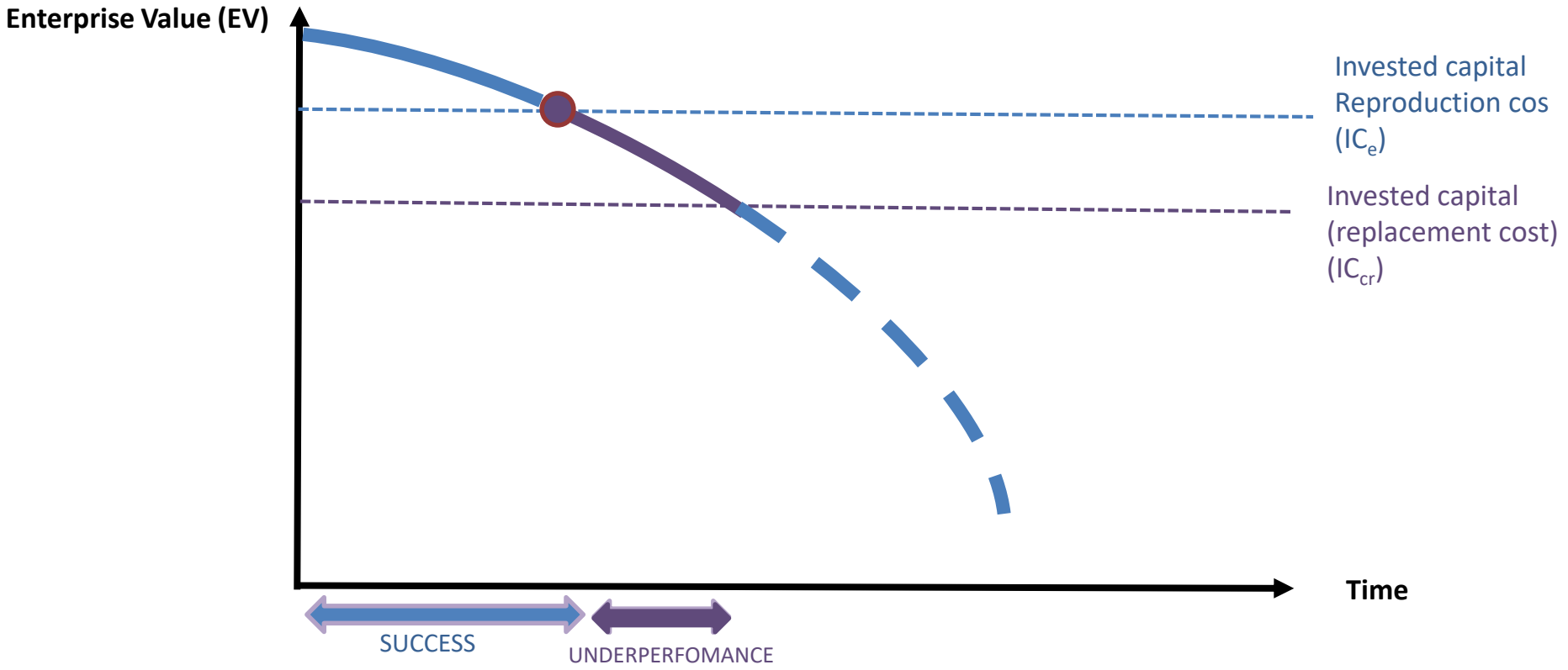
The more serious the problems, the quicker and more decisive the action that must be taken

SUCCESS
$ROIC_{reproduction\ cost} > coc;\ EV > IC_{reproduction\ cost}$



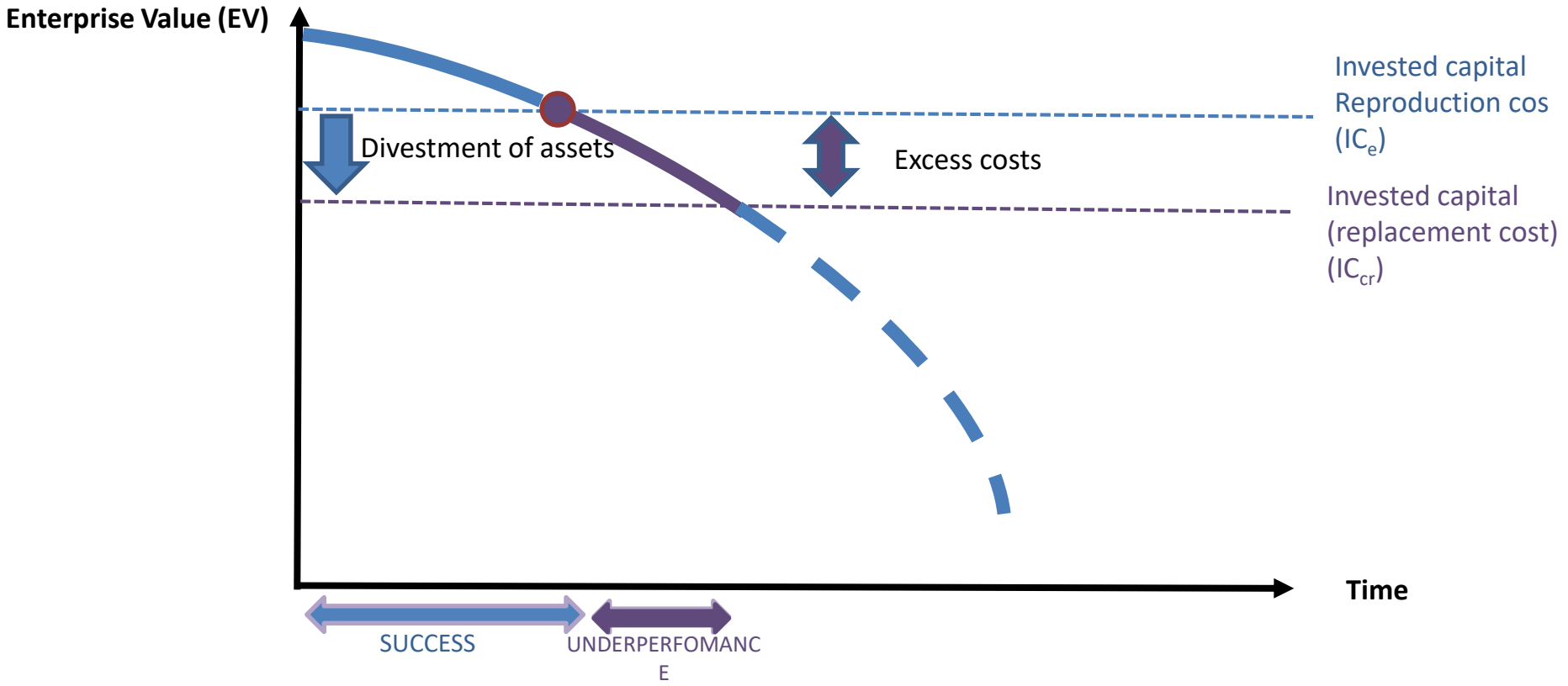
UNDERPERFORMANCE

$ROIC_{reproduction\ costs} < coc; ROIC_{replacement\ costs} > coc$



UNDERPERFORMANCE

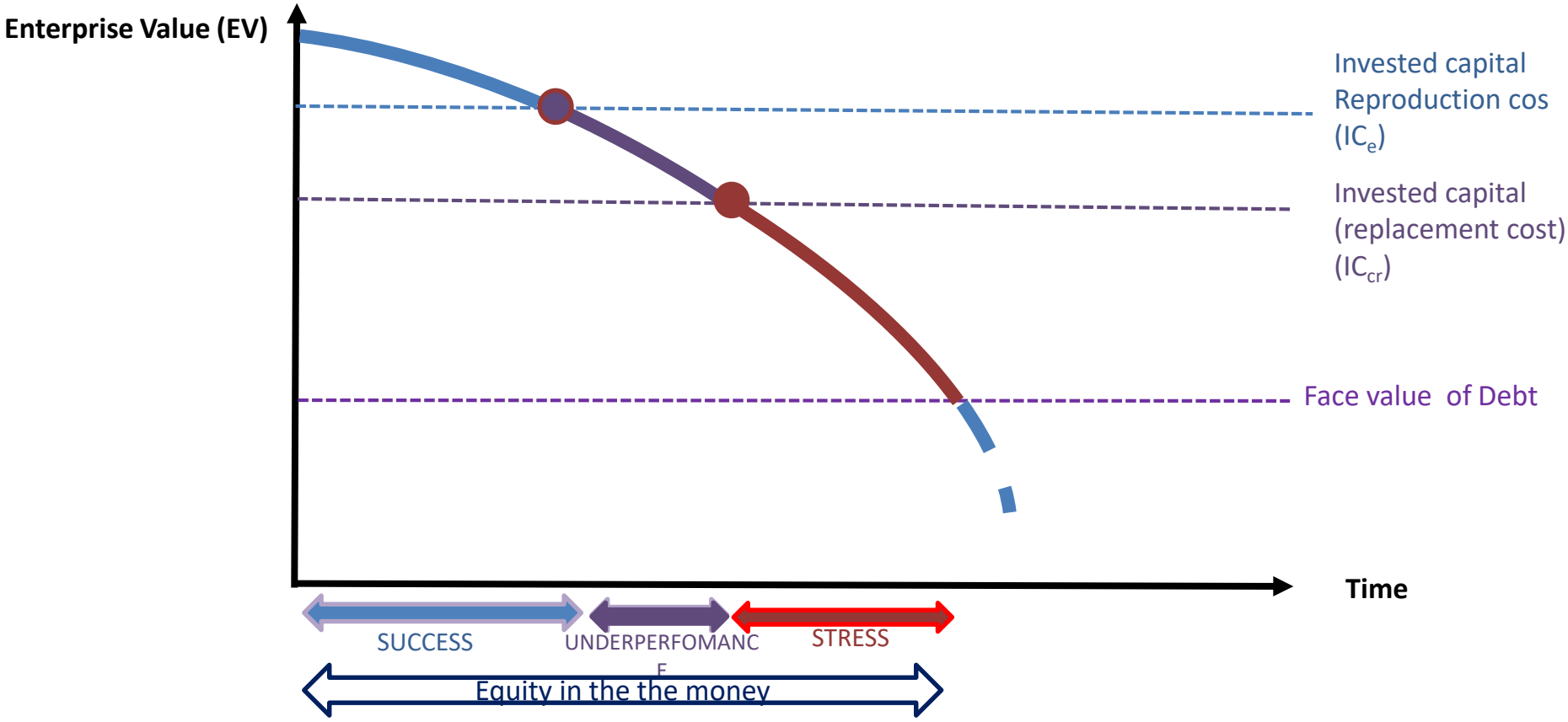
$ROIC_{reproduction\ costs} < coc; ROIC_{replacement\ costs} > coc$



STRESS

$ROIC_{replacement\ cost} < coc;$

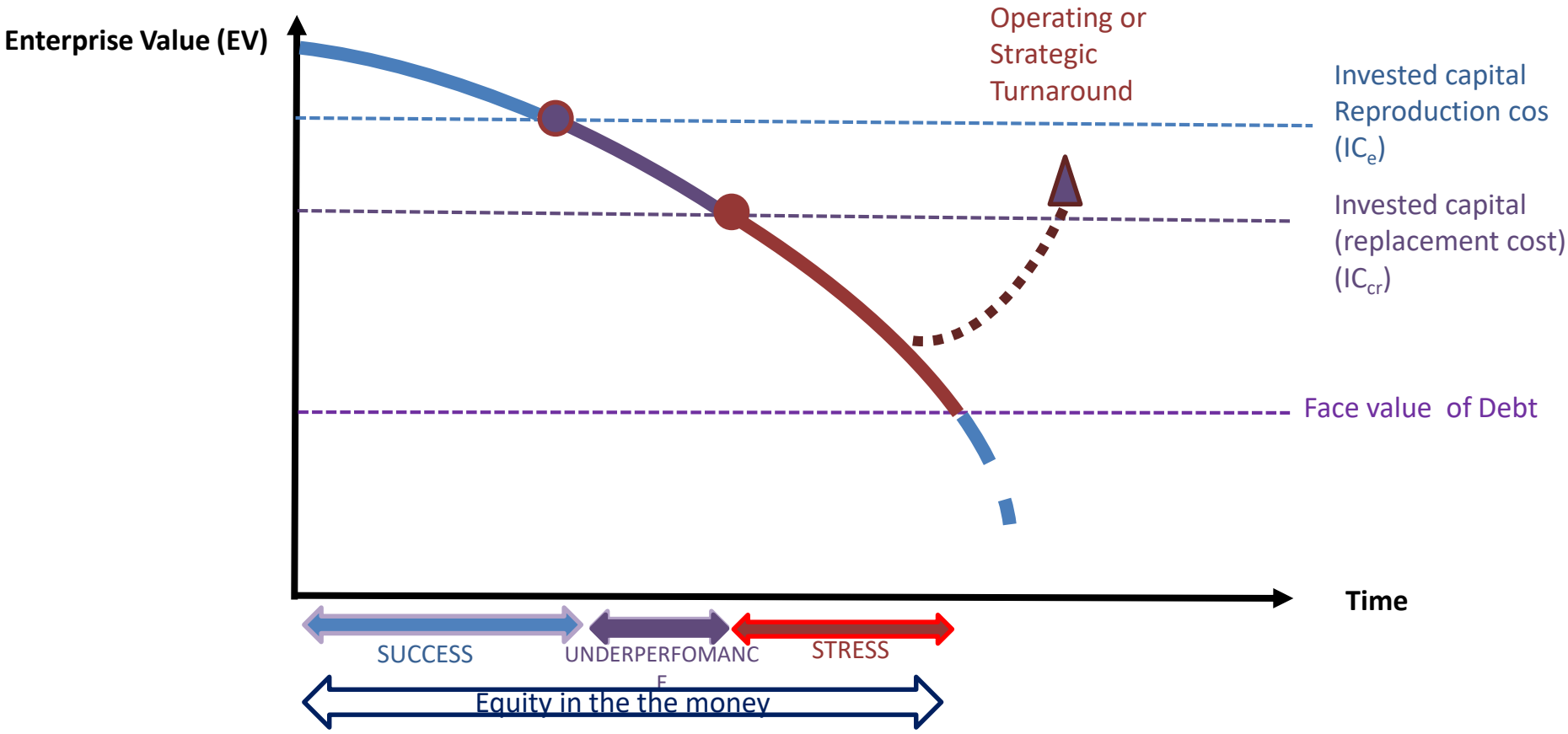
$IC_{replacement\ cost} < EV <$ Face value of debt



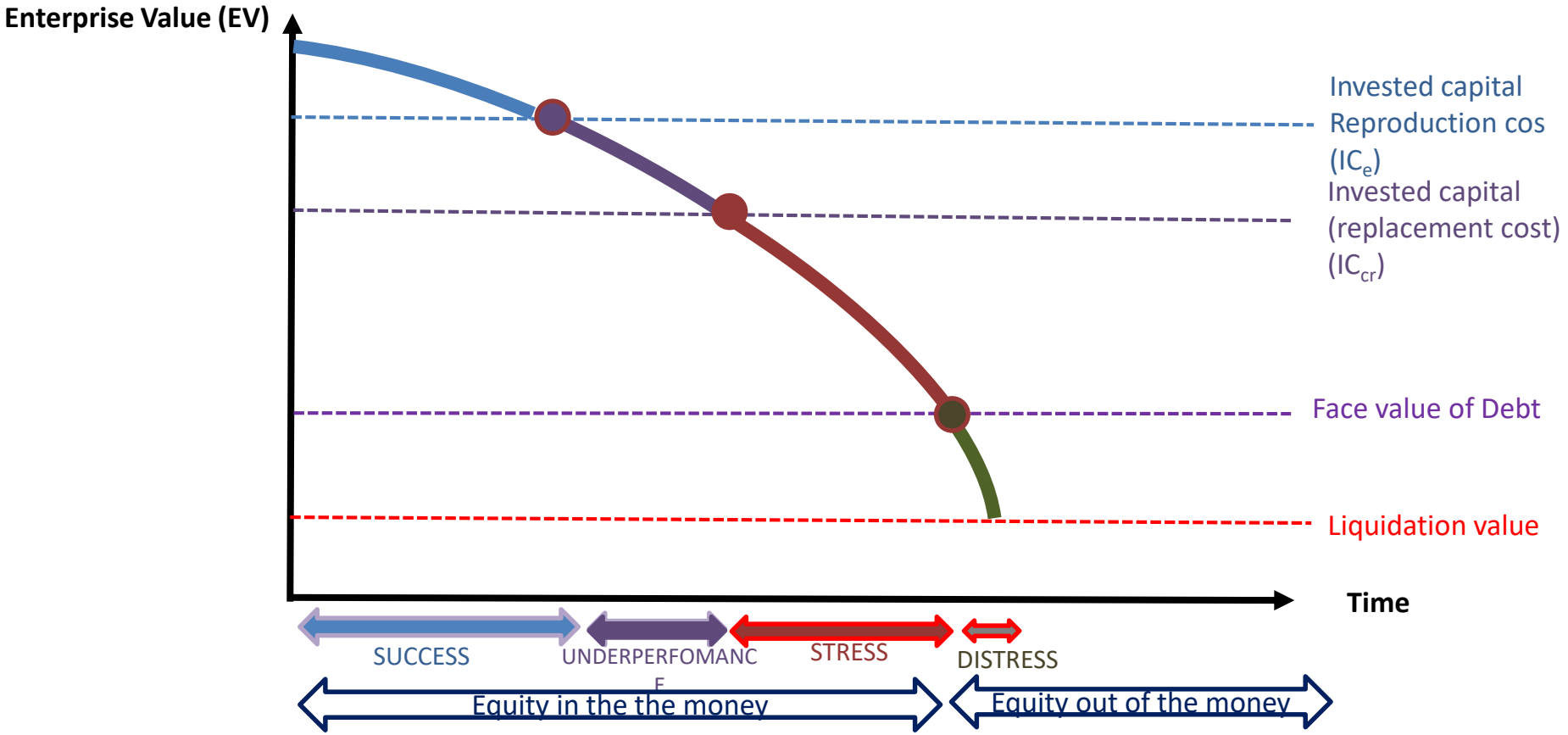
STRESS

$ROIC_{replacement\ cost} < coc;$

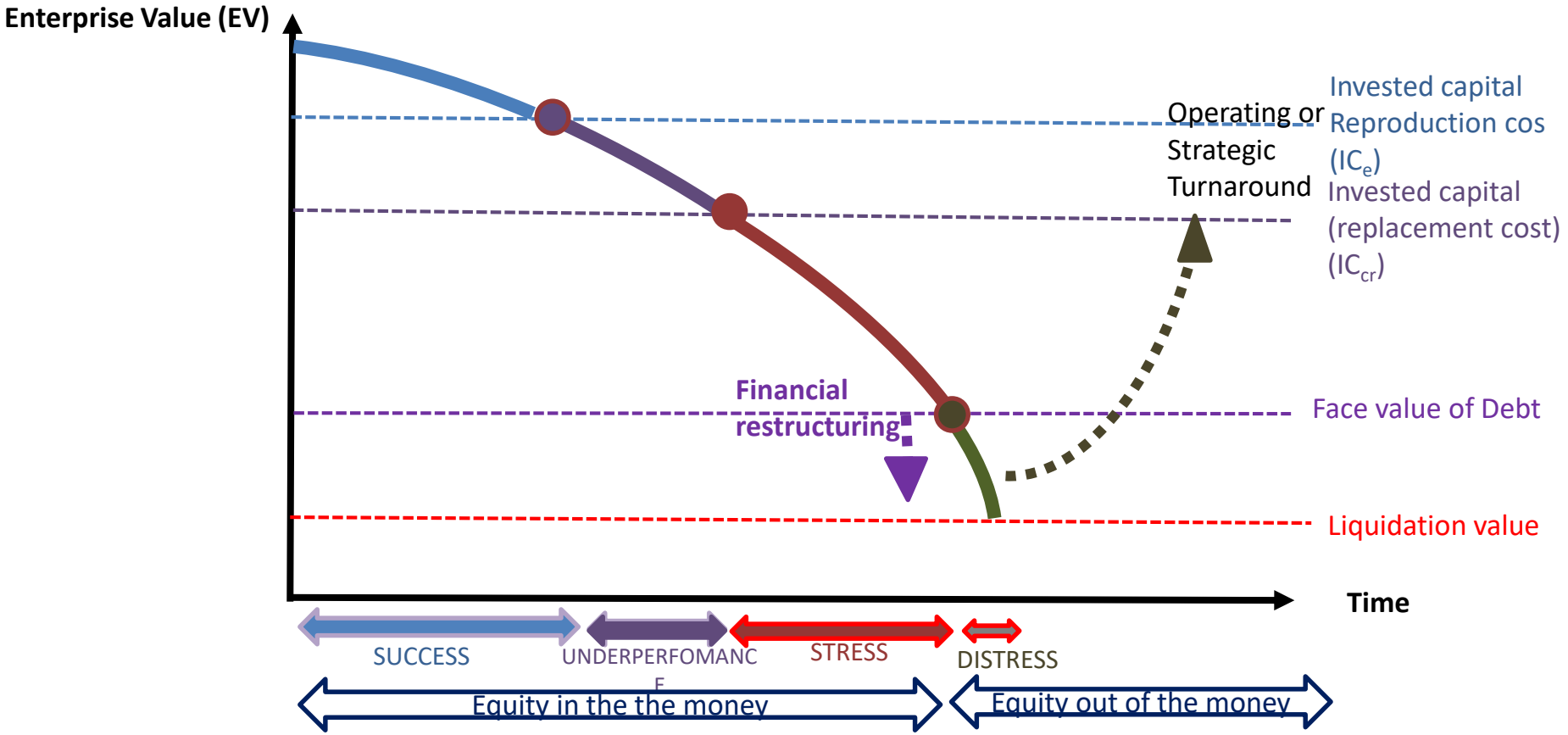
$IC_{replacement\ cost} < EV < Face\ value\ of\ debt$



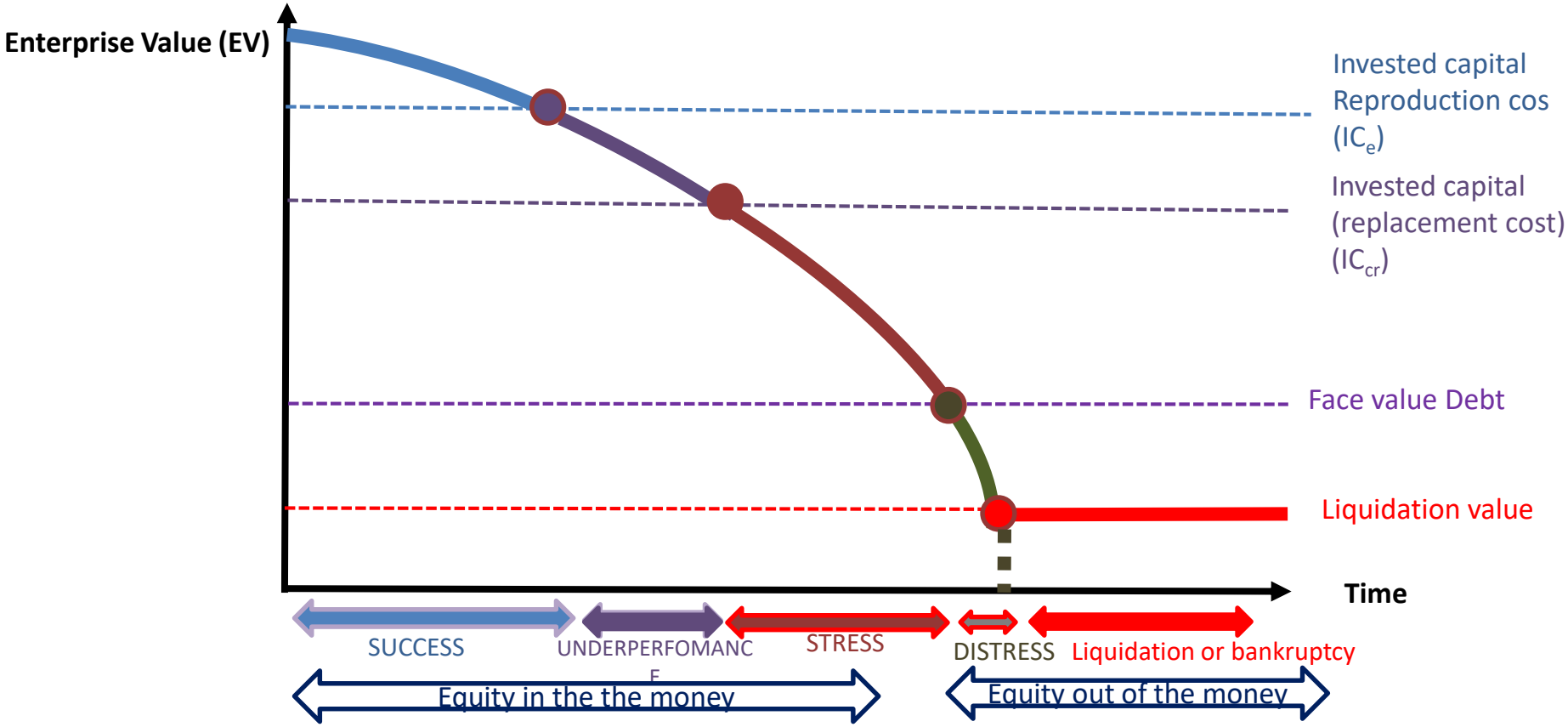
DISTRESS
Face value of Debt > EV > Liquidation value



DISTRESS
Face value of Debt > EV > Liquidation value

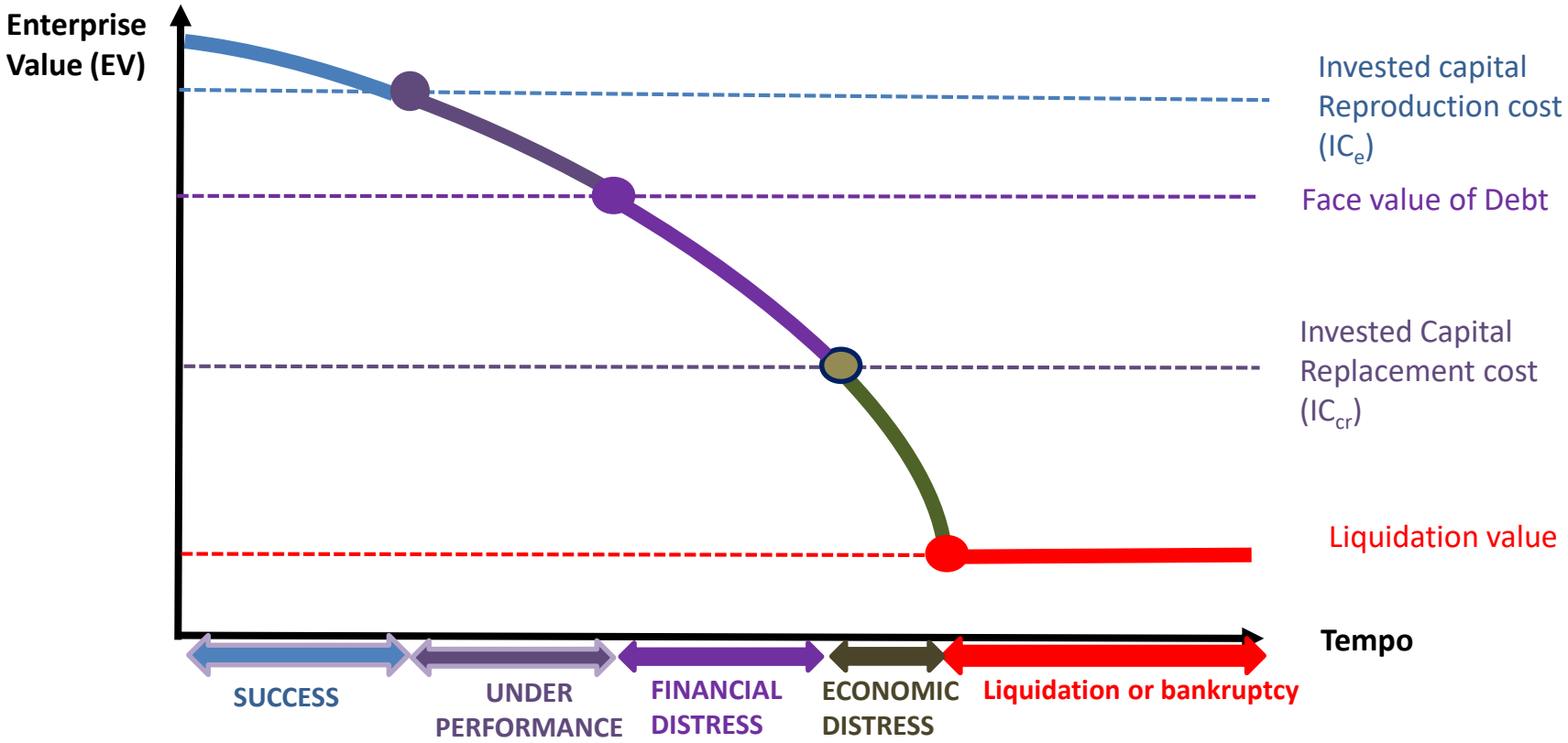


LIQUIDATION OR BANKRUPTCY
EV (going concern) < Liquidation value

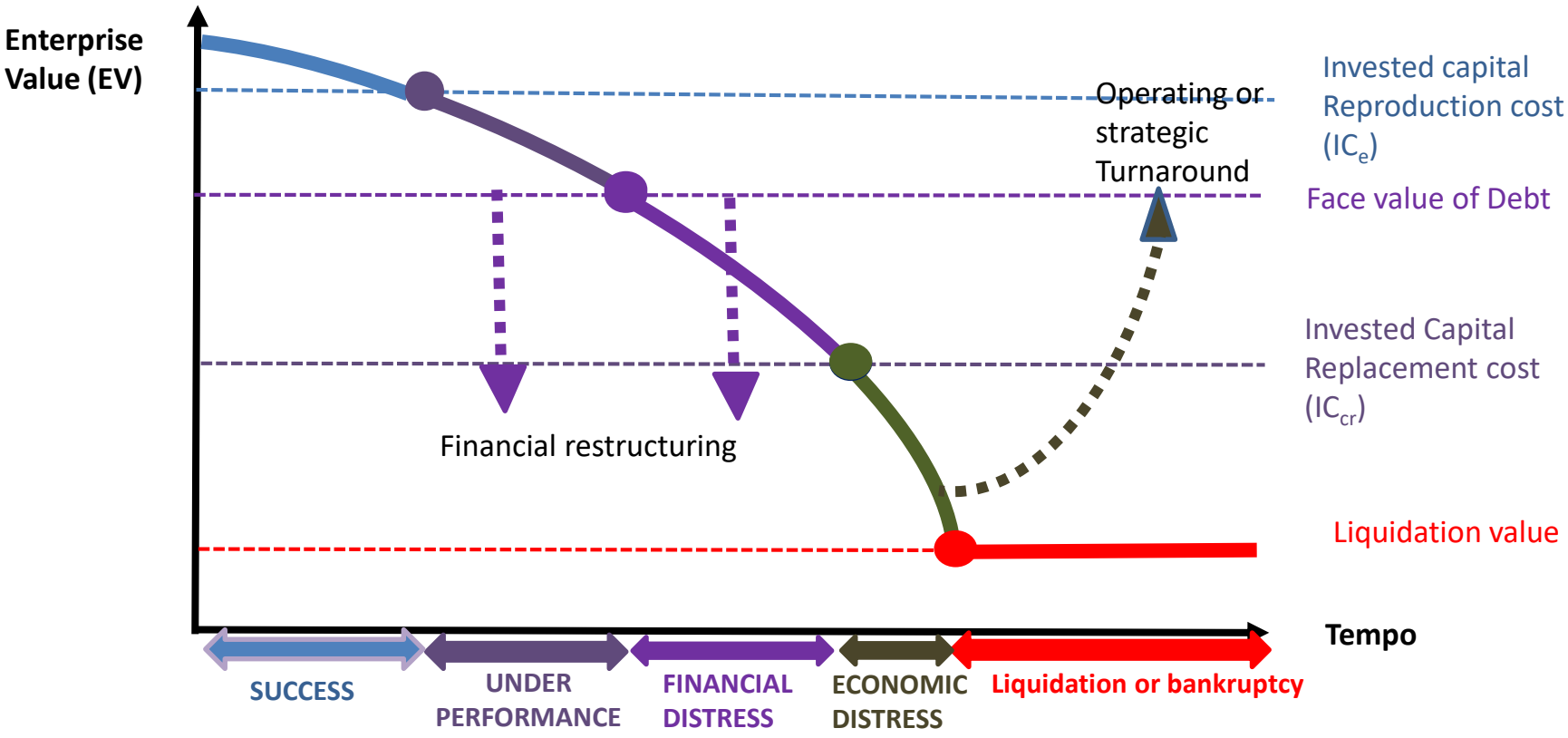


WHEN: Face Value of debt > Invested capital

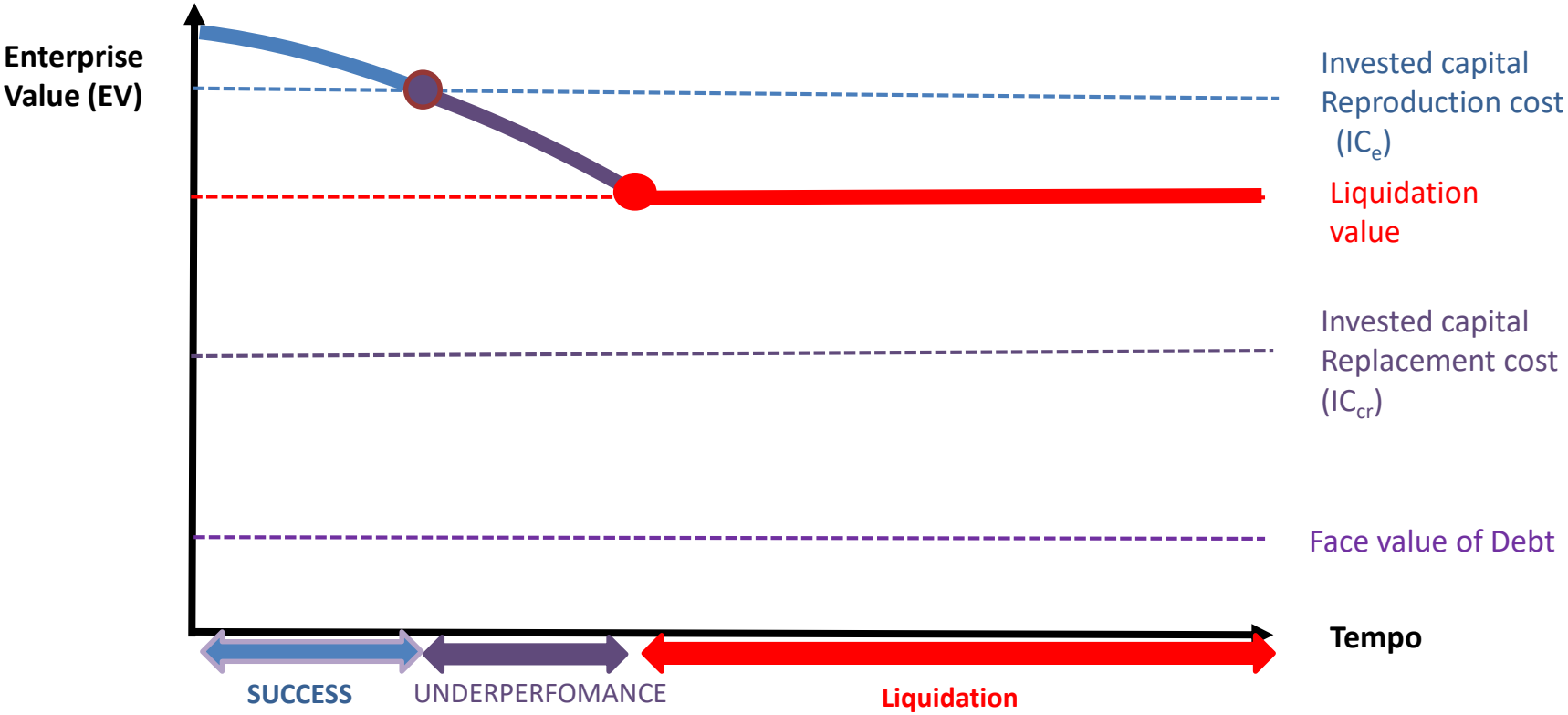
replacement costs



Face Value of debt > Invested capital replacement costs



When: Liquidation value > IC replacement costs



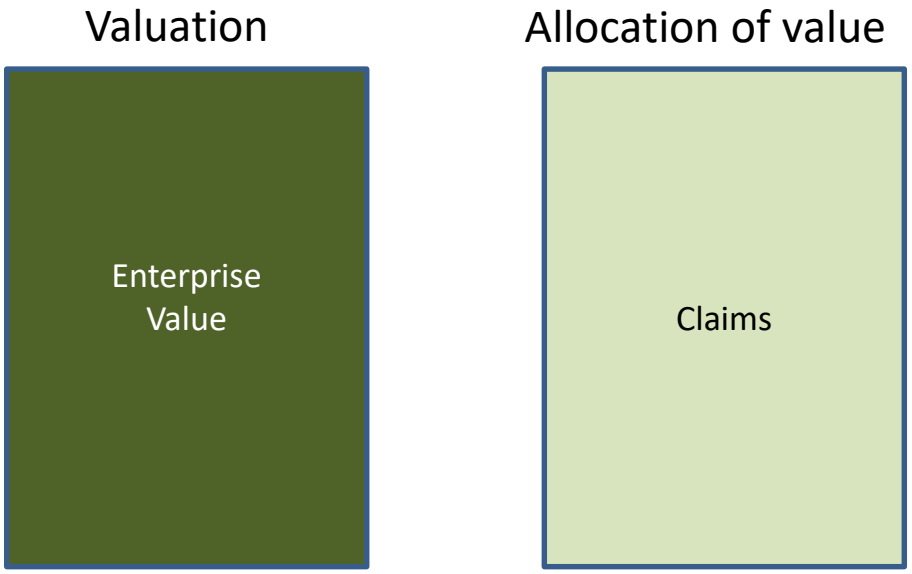
Take-aways

- ✓ *Economic imbalance* = EV< IC $_{\text{replacement cost}}$
- ✓ *Financial imbalance* = EV < Face value of debt
- ✓ *Economic and Financial imbalance* = EV < Face value of debt < IC replacement cost

Agenda

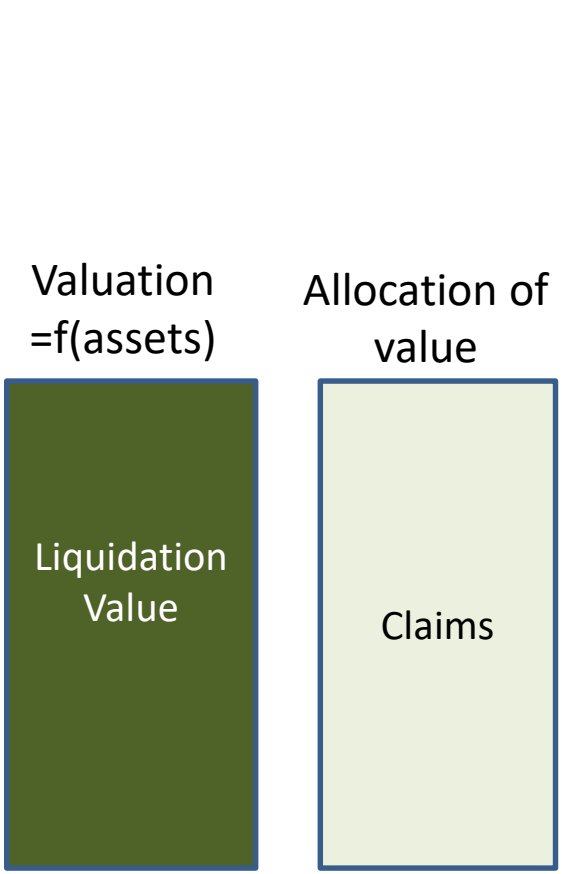
1. Business Life Cycle and Valuation
2. High Yield Debtors: probability of default, turnaround potential EV, discrete assets liquidation
3. Underperformance, Stress and Distress
4. Declining Business: situation analysis and reference points
5. Critical issues in valuation of distressed firms

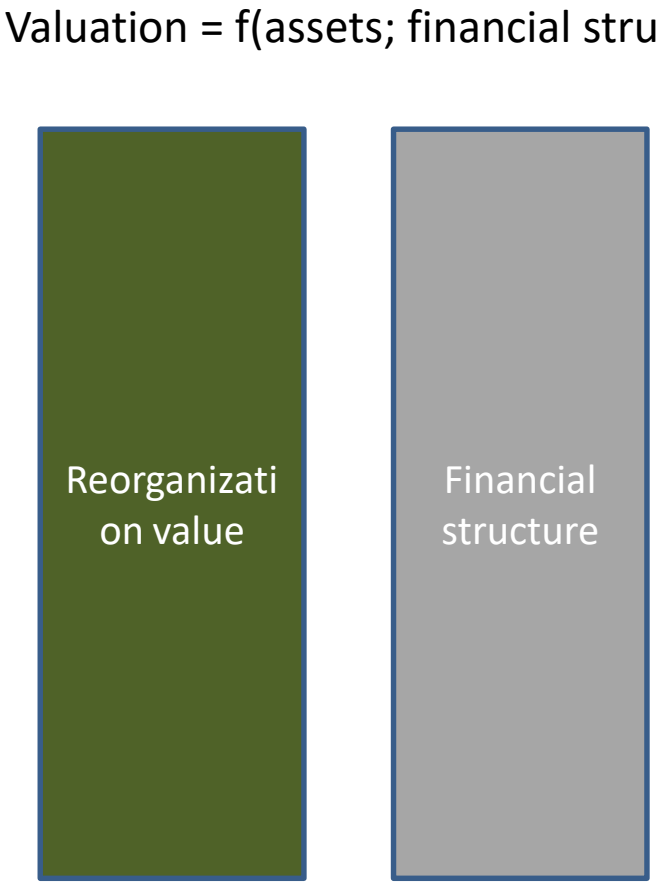
Valuation and allocation of value



On the basis of separation theorem: the value of the assets has no relation to how they are financed

Separation theorem doesn't hold for «reorganization value» (value in use not in exchange)



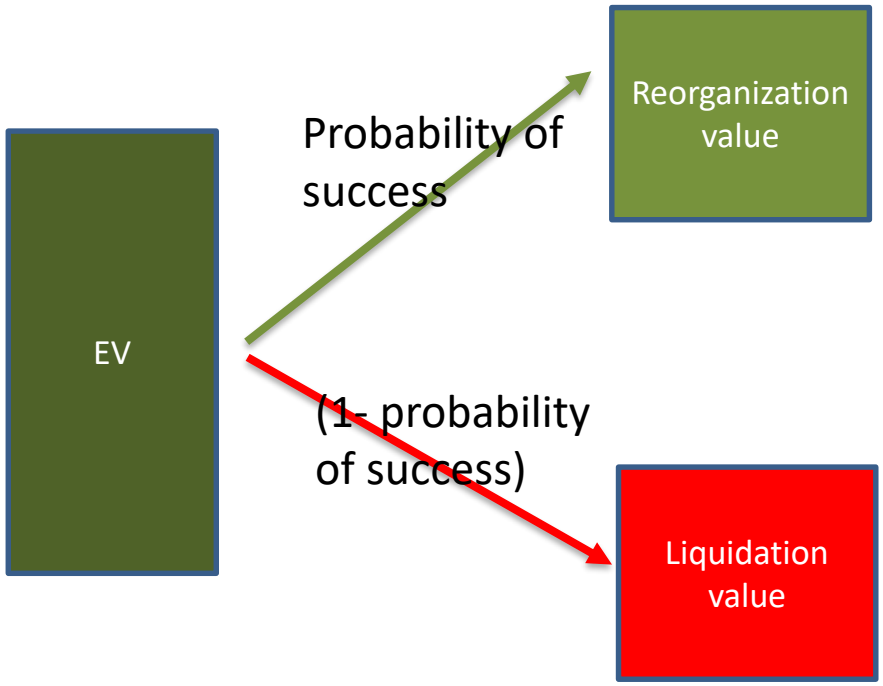


Asset Value and Debt Overhang

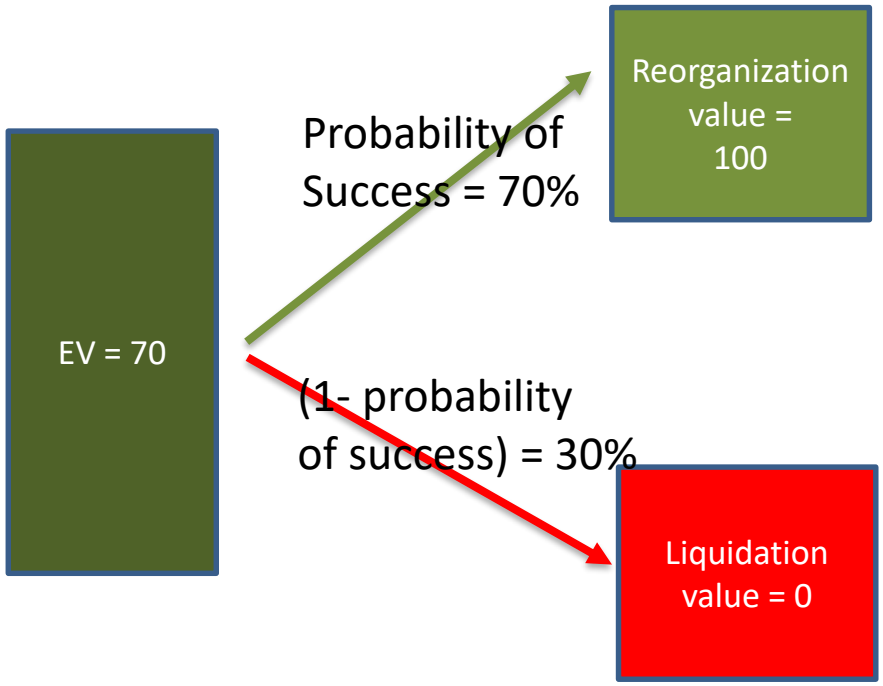
- Debt overhang refers to a debt burden so large that an entity cannot take on additional debt to finance future projects.
- The burden is so large that all earnings pay off existing debt rather than fund new investment projects, making the potential for defaulting higher.
- Debt overhangs can lead to underinvestment, which stunts growth, making recovery even more difficult.

EV is a weighted average of reorganization value and liquidation value

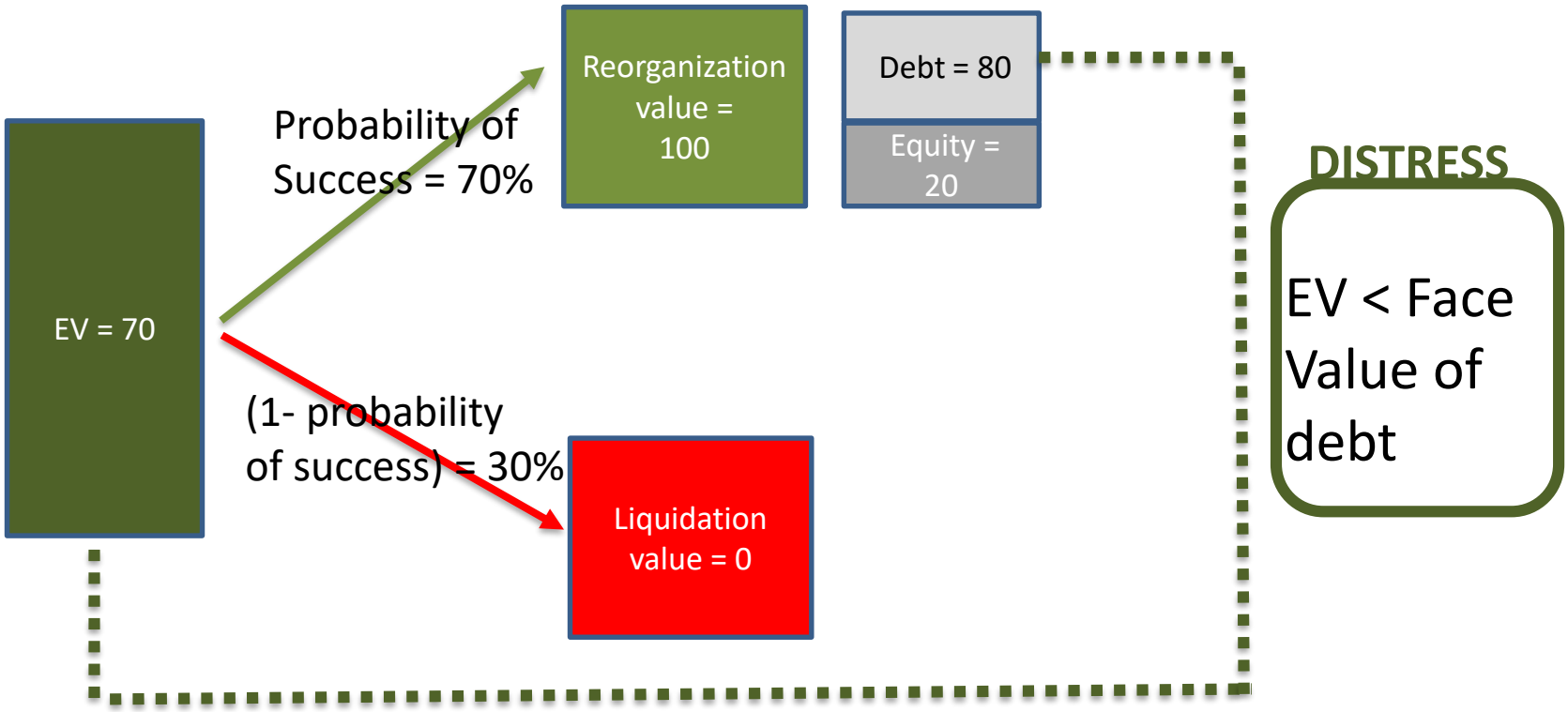
HP: Reorganization (overnight)



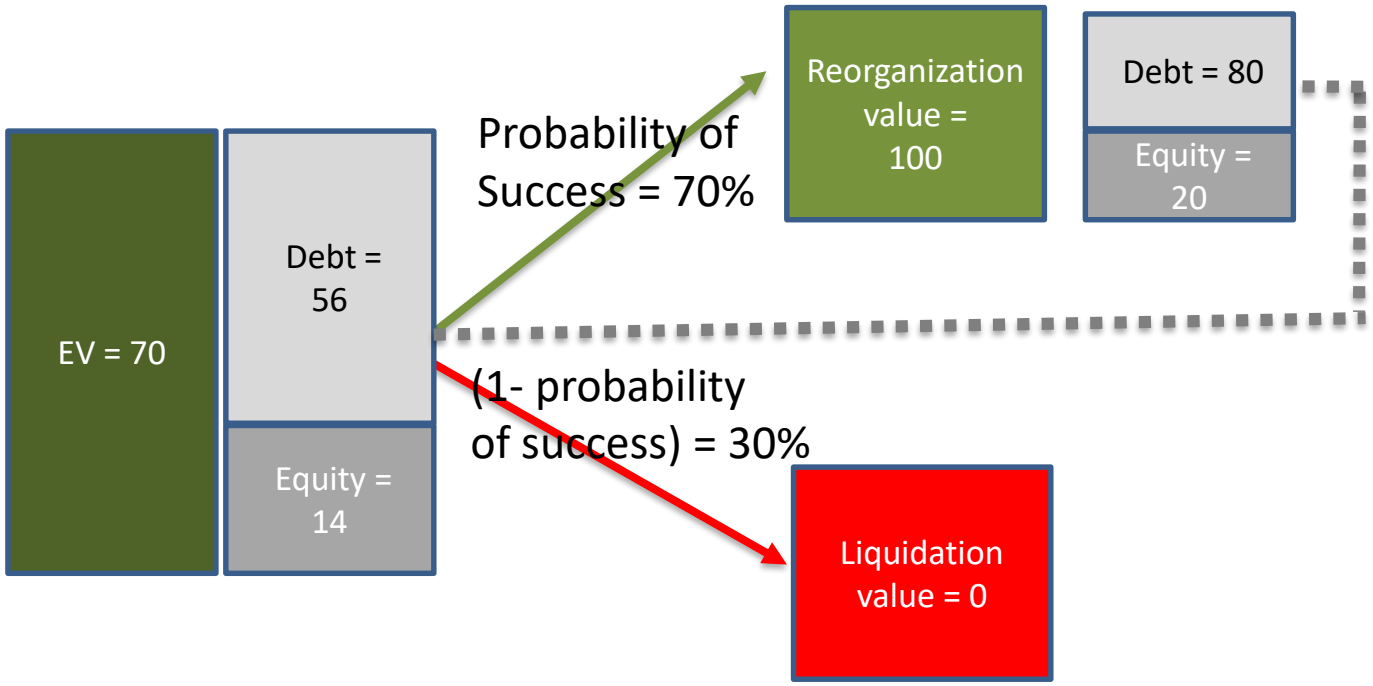
EV is a weighted average of reorganization value and liquidation value



EV is a weighted average of reorganization value and liquidation value



In Distress Equity Value > 0

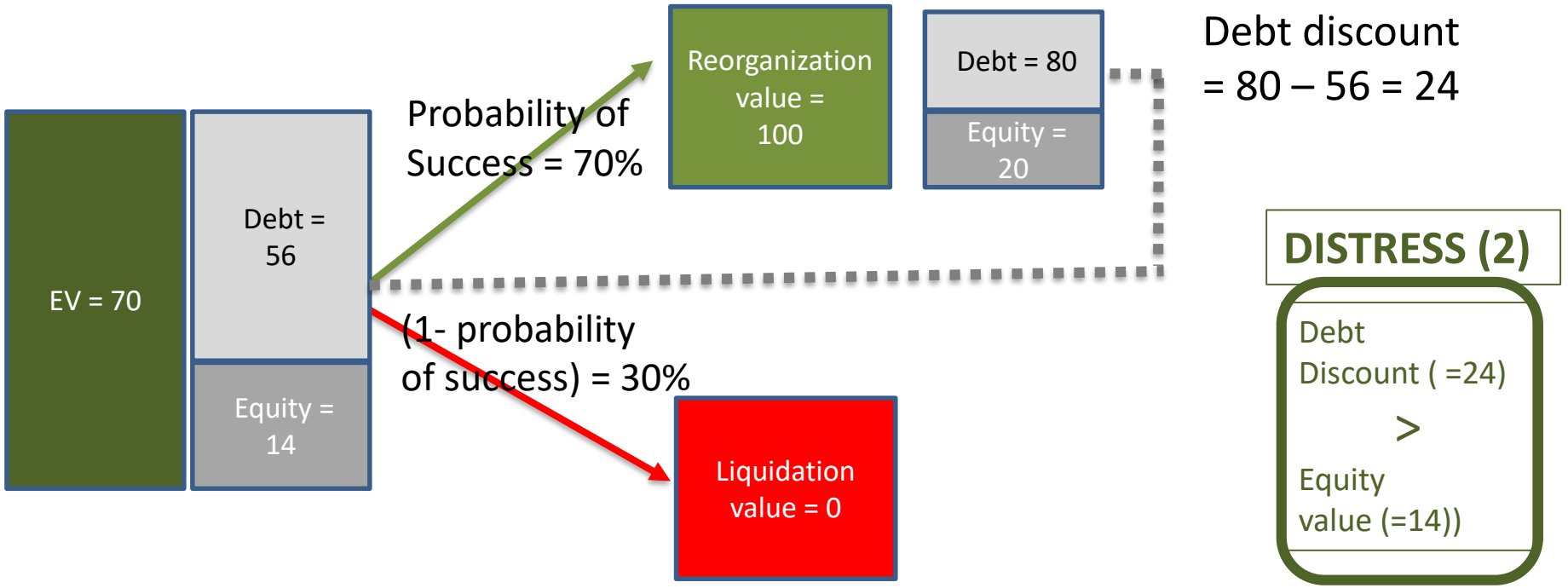


Debt discount = 80 – 56 = 24

DISTRESS (1)

Equity > 0
Even if:
EV <Face value of Debt
No-linearity of pay-off

In Distress Debt discount > Equity Value



Conditions of distress (=insolvency)

Face value of Debt > EV

Knowing that:

EV = FMV of Equity + FMV of Debt

Knowing that:

Face value of Debt = FMV of Debt + Debt Discount

Substituting:

FMV of Debt + Debt Discount > FMV of Equity + FMV of Debt

Canceling:

~~FMV of Debt~~ + Debt Discount > FMV of Equity + ~~FMV of Debt~~

we can write:

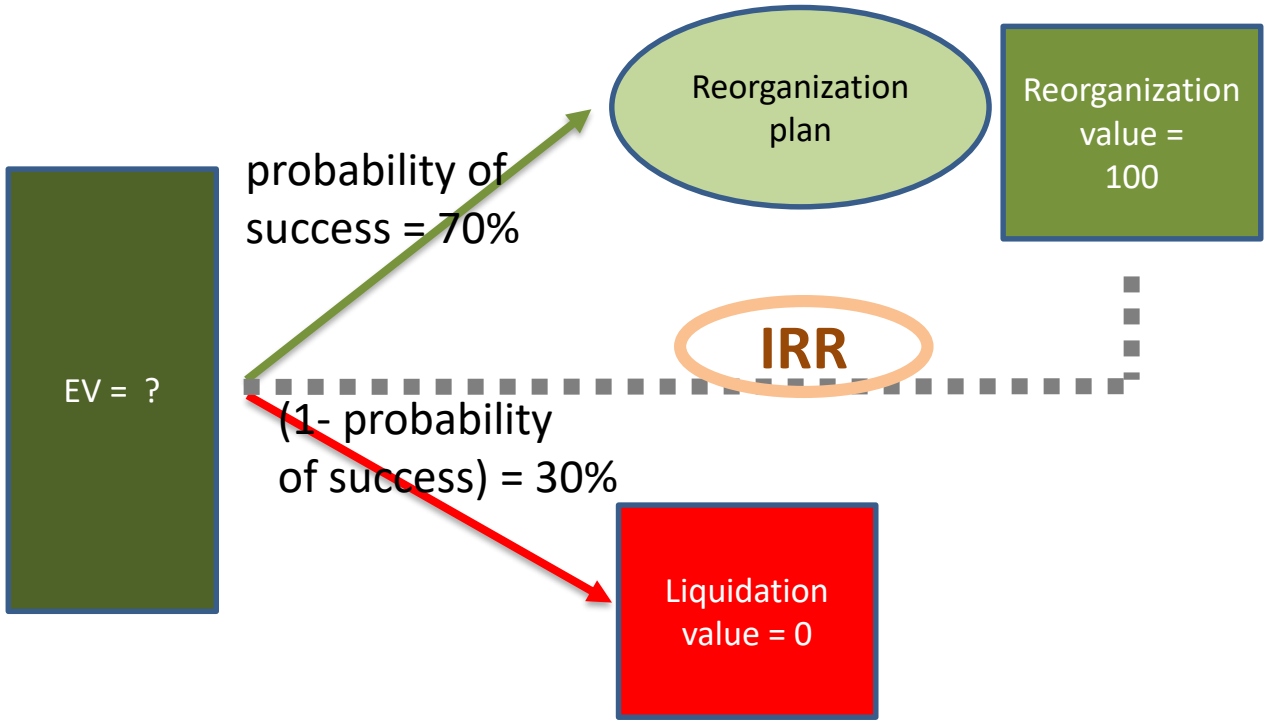
Face value Debt > EV *when* **Debt Discount > FMV of Equity**

Distress vs. Stress

Distress vs. Stress

	reorganization scenario	probability of success	Liquidation scenario	(1-probability of success)	Current values
Distress (EV < Face value of Debt):					
Debt Discount > Equity value					
EV	120	40%	60	60%	84
Market value debt	100	40%	60	60%	76
Equity value	20	40%	0	60%	8
Face value of Debts	100		100		100
Debt discount (= Face value of debt - Market value debt)	0		40		24
Stress (EV> Face value of debt):					
Debt Discount < Equity value					
EV	120	40%	90	60%	102
Market value debt	100	40%	90	60%	94
Equity value	20	40%	0	60%	8
Face value of Debts	100		100		100
Debt discount (= Face value of debt - Market value debt)	0		10		6

EV is a weighted average of reorganization value and liquidation value



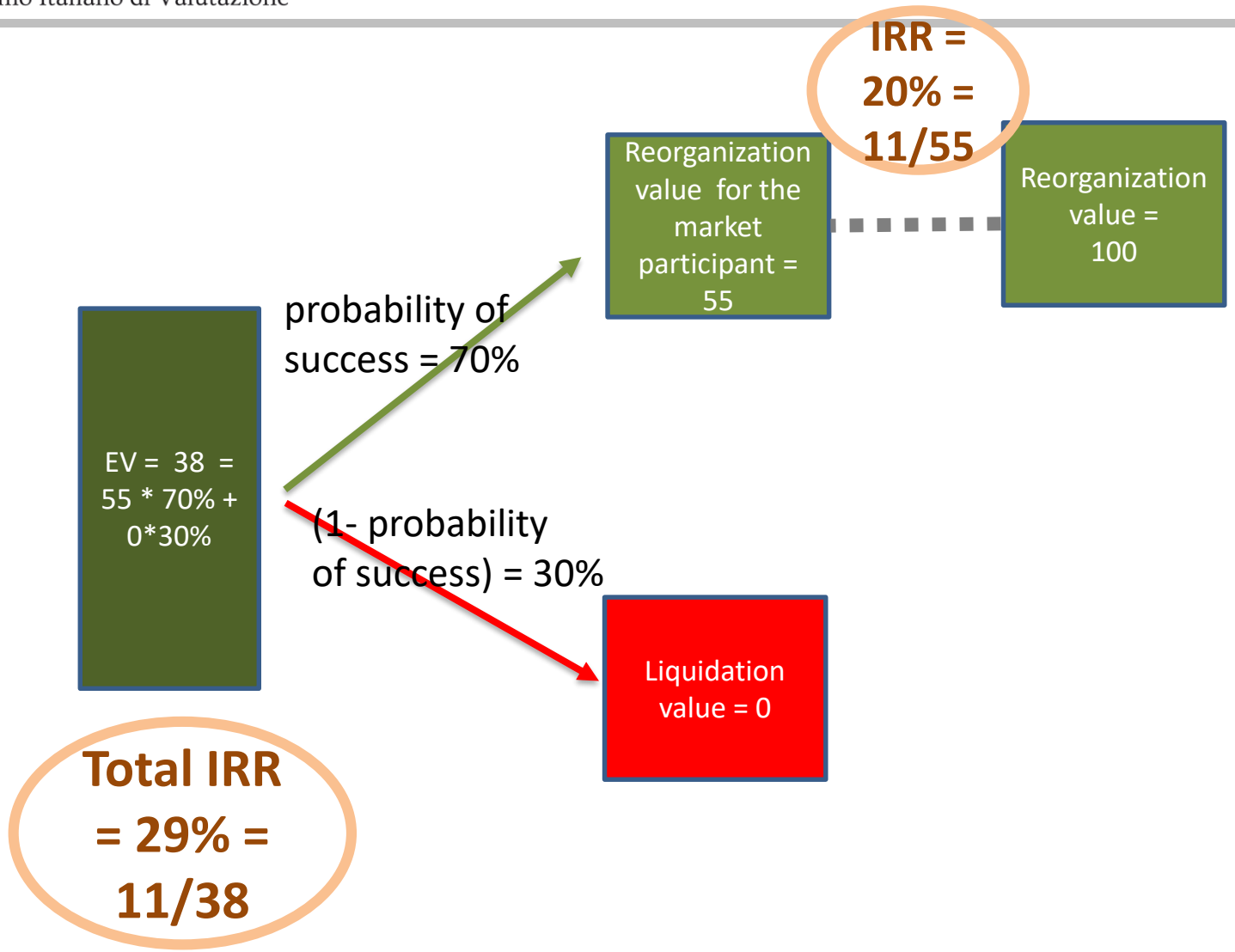
Reorganization plan: Path dependency ?

years	1	2	3	4	5
Operating Cash Flows	-5	10	15	17	20
Divestment			**30**		**20**
Investment	-10	-8	-10	-12	-9
UFCF w/divestment	-15	2	35	5	31
UFCF w/o divestment	-15	2	5	5	11

IRR or risk margin ?

a	UFCF (expected cash flows)	**10**	steady state
b	Wacc (Leverage median Industry)	10%	(50% debt; 50% equity)
c = a/b	EV	100	
Step 1 (financial structure)			
d	UFCF expected cash flows	**11**	w/o residual bankruptcy costs
e	Wacc (corporate structure w/safety buffer of equity)	14%	(10% debt; 90% equity)
f =e/d	EV w/safety buffer of equity	79	
Step 2 (worst scenario and financial structure)			
f	UCFC (worst scenario es. continuing Ebitda @default)	6	steady state
d	Wacc (corporate structure w/safety buffer of equity)	14%	(10% debt; 90% equity)
g=f/d	EV worst scenario	43	
Step 3 (calculation Risk margin)			
h = e-g	EV w/safety buffer of equity - EV worst scenario	36	
i	Probability worst scenario	67%	
l = i*h	**Risk margin**	24	EV difference * probability
Step 4:			
m =e-l	**Reorganization value for market participant**	55	=EV w/safety buffer of equity- Risk margin
n= d/m	**IRR**	**20%**	=11/55

EV is a weighted average of reorganization value and liquidation value



Take-aways

- ✓ In Distressed businesses: Debt discount >Equity value >0
- ✓ Reorganization value is function of:
  - financial structure;
  - bankruptcy costs;
  - future divestment
- ✓ Reorganization value for the market participant is a function of risk margin/IRR
- ✓ Risk Margin is a function of:
  - distribution of reorganization scenarios (usually not normally distributed)
  - distance between worst scenario and expected scenario
  - probability of worst scenario in reorganization