

Startup-Bewertung

Franken Finance Festival



Who we are



Daniel Pflaum

Director
DEALS

daniel.pflaum@pwc.com
+49 151 728 182 54



Peter Reubelt, CFA

Senior Associate
DEALS

peter.reubelt@pwc.com
+49 151 184 438 43

AGENDA



1

Startup-Bewertung

2

Marktentwicklung

3

Bewertung von Anteilsgattungen



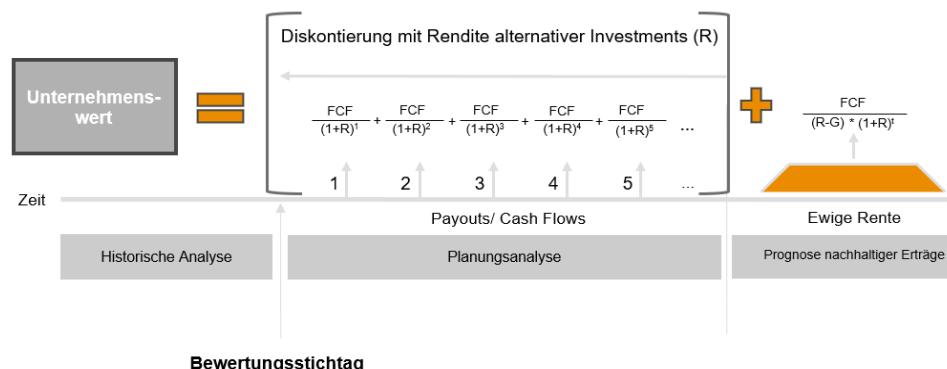
Grundlagen der Bewertung

Grundlegende Bewertungsmethoden sind die Multiplikatoren- und die DCF-Methode

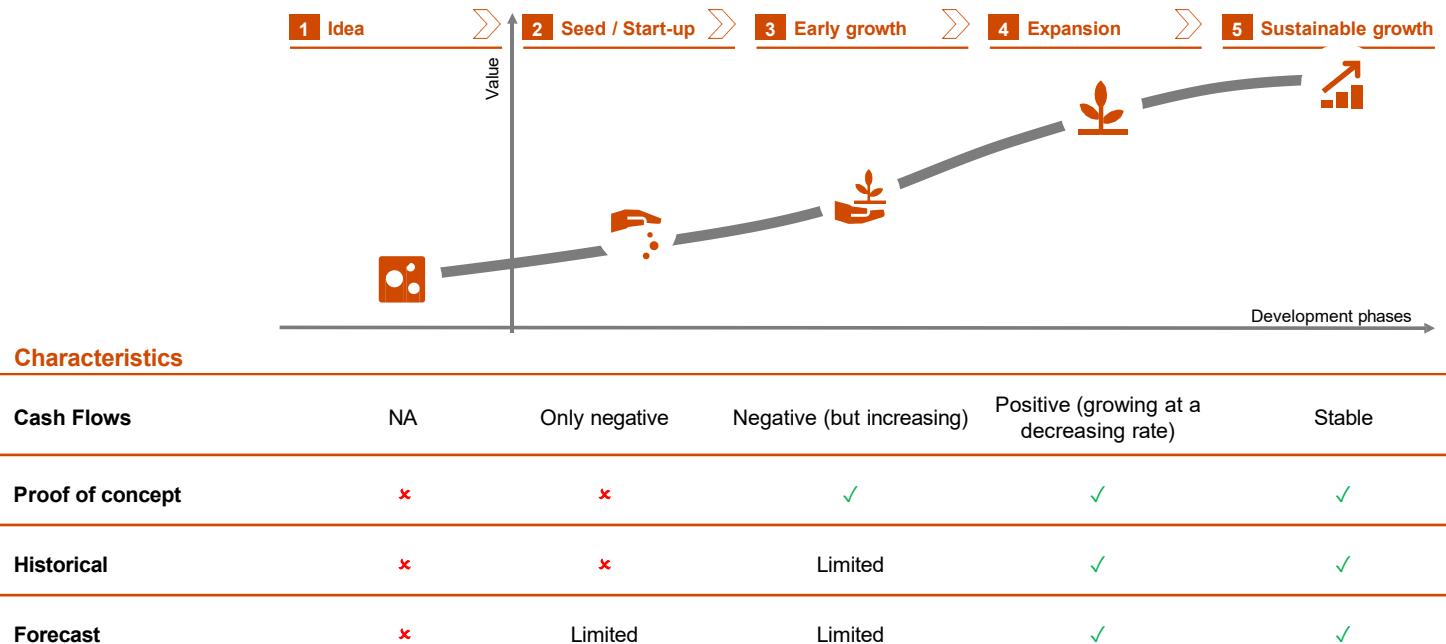
1. Multiplikatoren



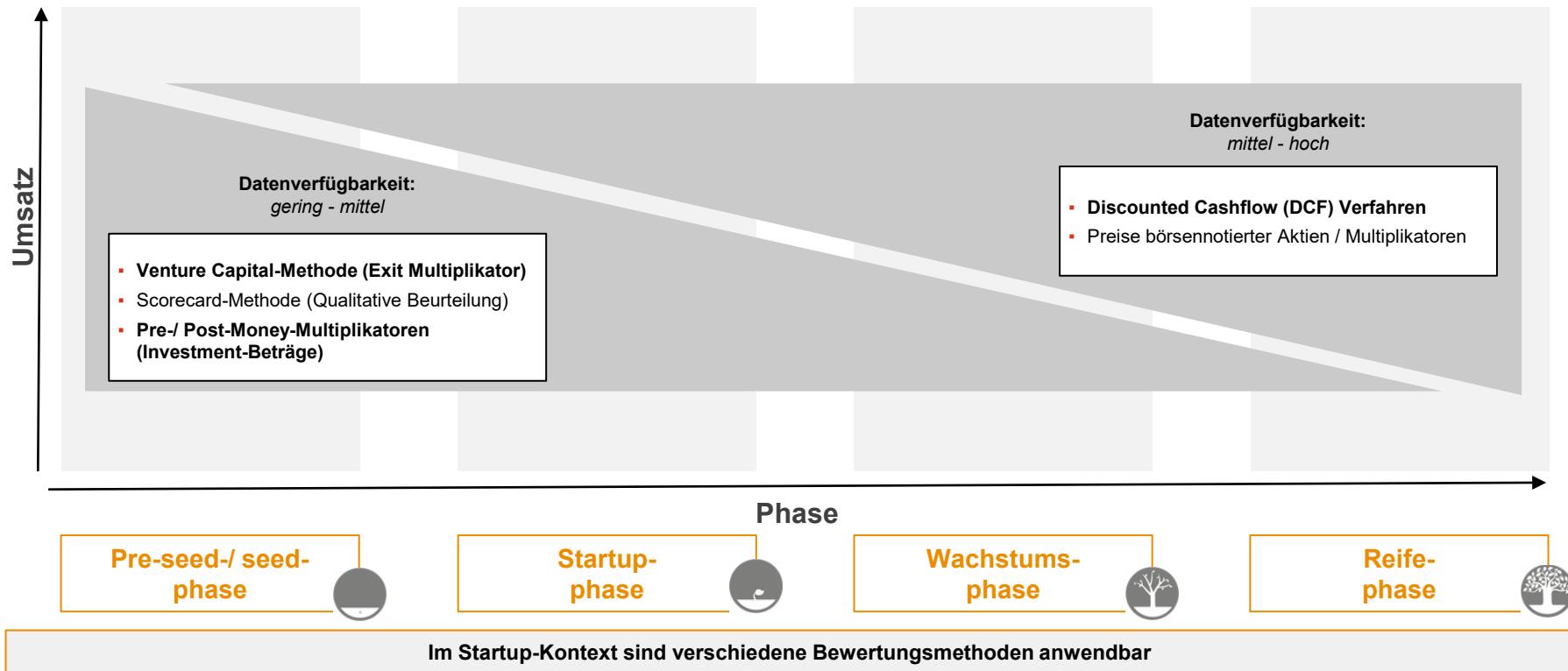
2. Discounted Cashflow (DCF)



Nicht alle Start-ups sind gleich – mit steigender Maturität verbessert sich die Datenlage



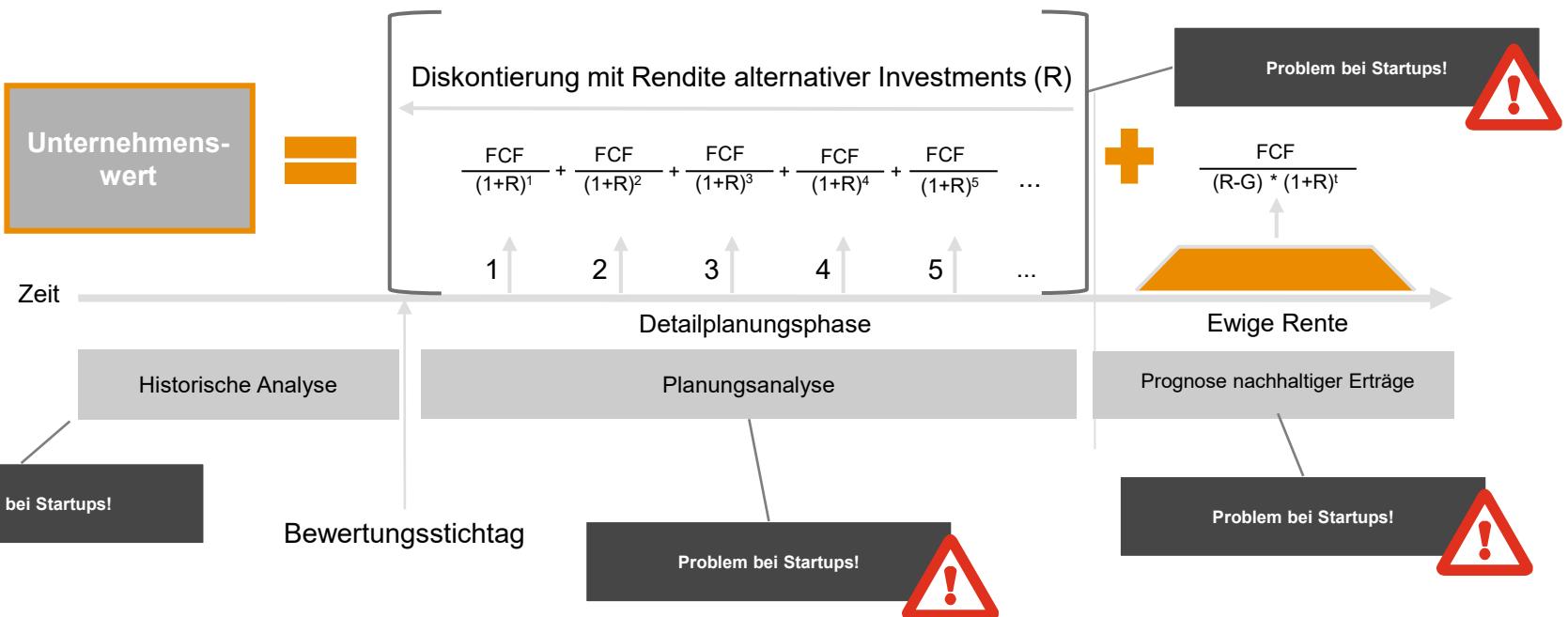
Bewertungsmethoden für Startups sind phasenabhängig



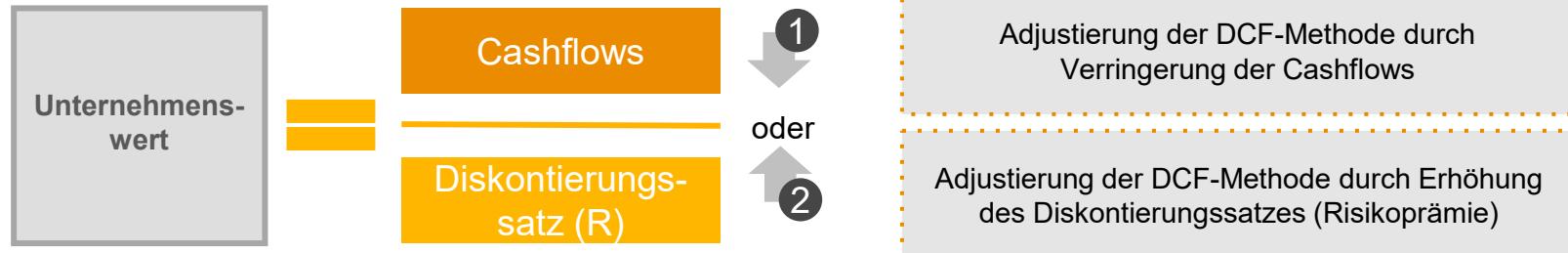


DCF-Ansätze

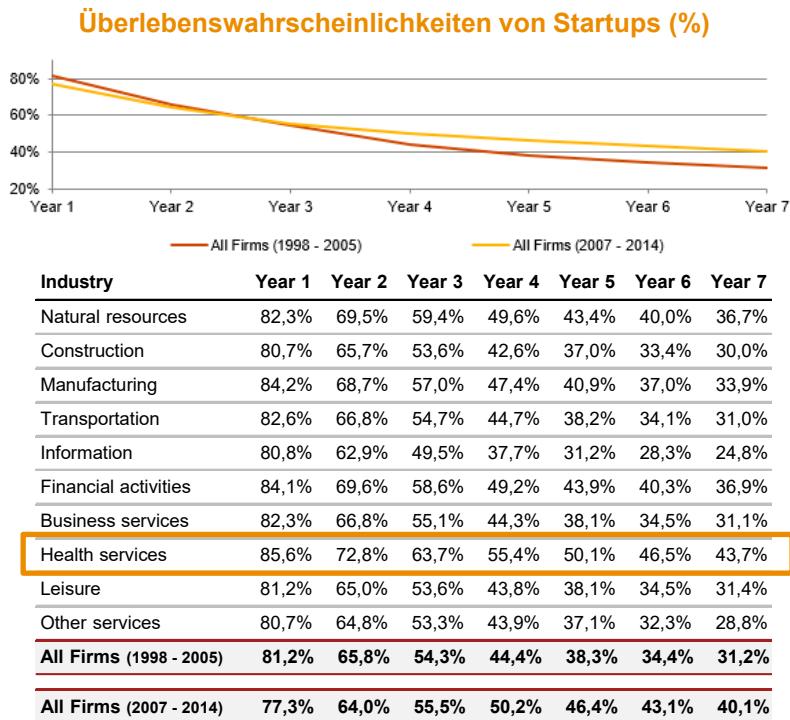
Die klassische DCF-Methode stößt bei Startups an ihre Grenzen



Wie wird das Risiko von jungen Wachstumsunternehmen in der Bewertung mithilfe der DCF-Methode reflektiert?



Option 1: Anwendung empirischer Überlebensraten auf die Cashflows



Entwicklung in den ersten sieben Betriebsjahren

- Nur ca. **80%** aller Start-ups überleben das erste Jahr
- Die **ersten vier Jahre** nach der Gründung sind die **kritischsten**: Nur **50%** sind nach vier Jahren noch **wettbewerbsfähig**.
- Nach **sieben Jahren** sind **60% - 70%** der Start-ups verschwunden.
- Im Bereich der **Informationstechnologie** überleben nur **25%**. Im Gegensatz dazu liegt die Überlebensrate im Bereich der **Gesundheitsdienstleistungen** bei **44%**.
- Aktuelle Trends:
 - Insgesamt sind die Überlebensraten von Gründungen in den letzten 10 Jahren gestiegen.

Quelle: Damodaran (2009), Valuing Young, Start-up and Growth Companies: Estimation Issues and Valuation Challenges

Option 2: Erhöhung des Diskontierungssatzes auf Basis empirischer Studien iVm Scorecard

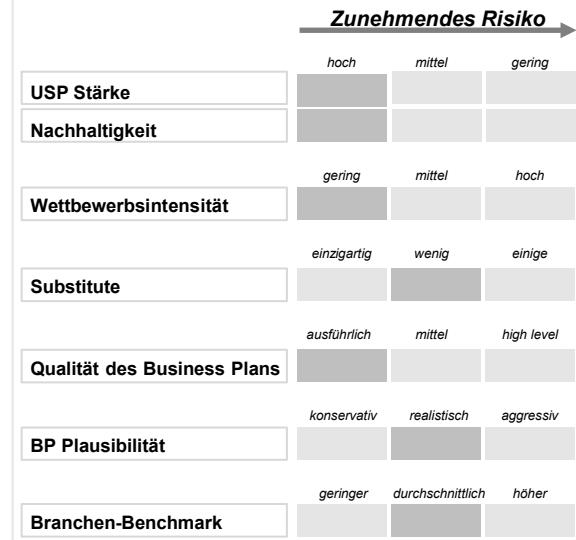
Phase	Seed	Seed / Start-up	Early growth	Expansion
Plummer ¹	50%–70%	40%–60%	35%–50%	25%–35%
Scherlis & Sahlman ²	50%–70%	40%–60%	30%–50%	20%–35%
Sahlman, Stevenson, & Bhide ³	50%–100%	40%–60%	30%–40%	20%–30%
VC guide in BE ⁴	50%–100%	50%–60%	40%–50%	30%–40%
Damodaran ⁵	50%–70%	40%–60%	35%–50%	25%–35%
Everett survey ⁶	n.a.	28%–48%	25%–33%	24%–33%
Selected discount rate	50%–85%	40%–50%	30%–40%	20%–30%
Main characteristics	<ul style="list-style-type: none"> • First idea • Understanding marketability • Building an MVP <ul style="list-style-type: none"> • Go-to-market • Define business model • Testing MVP • First revenues • Continuous feedback on MVP • First hires <ul style="list-style-type: none"> • Product revenue starts to increase • Aiming towards break-even point • Pivot business model where needed • Competition increases • Team structure becomes more complex <ul style="list-style-type: none"> • Marketing efforts increase • Cash flows become positive and more stable • Recurring / growing revenues and +/- break even • Expansion to new products or markets 			

Sources:

1. Plummer, QED Report on Venture Capital Financial Analysis, 1989
2. Scherlis and Sahlman, A method for Valuing High-Risk, Long Term, Investments: The Venture Capital Method, 1998
3. Sahlman, Stevenson, and Bhide, Financing Entrepreneurial Ventures, 1998
4. Mangart and Witmeur, Venture Capital guide for Belgium, 2009
5. Damodaran, Valuing Young, Start-up and Growth Companies: Estimation Issues and Valuation Challenges, 2009
6. Pepperdine University, 2020 Private Capital Markets Report, 2020

Risikoprämie

Risikobewertung im Detail





Pre-/Post-Money Multiplikatoren

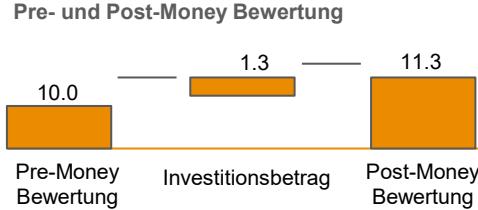
Das Verhältnis zwischen Investiertem Kapital und Bewertung als Multiplikator

Illustratives Beispiel

Finanzierungsrounde (in €)

Investors	Founding			Seed round			A round			B round			C round		
	Cash Investment	# Total Shares	% of ownership	Cash Investment	# Total Shares	% of ownership	Cash Investment	# Total Shares	% of ownership	Cash Investment	# Total Shares	% of ownership	Cash Investment	# Total Shares	% of ownership
Founders/Management	25.000	25.000	100,0%	25.000	25.000	75,0%	25.000	25.000	59,6%	25.000	25.000	52,6%	25.000	25.000	47,5%
Business Angels	0	0	0,0%	500.000	8.333	25,0%	500.000	8.333	19,9%	500.000	8.333	17,5%	500.000	8.333	15,8%
Venture Capital	0	0	0,0%	0	0	0,0%	1.425.000	8.636	20,6%	2.000.000	11.050	23,2%	3.500.000	15.803	30,0%
Corporate	0	0	0,0%	0	0	0,0%	0	0	0,0%	750.000	3.148	6,6%	850.000	3.465	6,6%
Total	25.000	25.000	100,0%	525.000	33.333	100,0%	1.950.000	41.970	100,0%	3.275.000	47.531	100,0%	4.875.000	52.601	100,0%
Capital raised				25.000			500.000			1.425.000			1.325.000		1.600.000
Price per Share in EUR				1			60			165			238		316
Pre-Money Valuation				0			1.500.000			5.500.000			10.000.000		15.000.000
Post-Money Valuation				25.000			2.000.000			6.925.000			11.325.000		16.600.000
No. of shares issued				25.000			8.333			8.636			5.561		5.070
Implied post-money multiple															
				1,0x			3,8x			3,6x			3,5x		3,4x

Investitionsbetrag, Preis pro Aktie und Anzahl der Aktien werden benötigt, um den Pre-Money- und Post-Money-Wert abzuleiten.



Berechnung Pre- und Post-Money-Wert (in €)

No. of shares A round	41.970
Share price B round	238,27
Pre-Money Valuation (Common Stock)	10.000.000
Capital raised in B round	1.325.000
Share price B round	238,27
No. of shares issued in B round	5.561
Post-Money Valuation (Value Series B shares)	11.325.000
Total capital raised	3.275.000
Implied post-money multiple	3,5x



Venture Capital-Methode

VC-Methode: Bewertung eines Startups anhand erwarteter Exit-Multiples

VC-Methode

Post-Money Wert



$$\text{Post-Money Wert} = \frac{\text{Umsatz (zum Exit Zeitpunkt)} * \text{Umsatz-Multiple}}{(1+r_{\text{erwartete Rendite}})^{\text{Exit Jahr (n)}}}$$

Illustratives Beispiel
5

Zeit bis Exit in Jahren

15.000.000

Umsatz zum Exit Zeitpunkt

6,2x

Umsatz Multiple

93.000.000

Wert zum Exit Zeitpunkt

9,8%

WACC

43,5%

VC Premium

53,3%

Discount p.a.

Basierend auf der VC-Methode hat das Unternehmen einen [Post-Money] Unternehmenswert von 11,0 Mio.€.

Zusammenfassung

1 Discounted cash flows

- Based on the **expected cash flows** that will be generated by the start-up
- Time Value of Money is considered (WACC)
- Looking forward methodology – deriving the intrinsic value

2 Money Multiples

- Based on past/ current financing rounds
- Goal is to evaluate how much investors have paid for comparable financing rounds in the past in order to come up with a pre-money valuation estimate

3 VC method

- Based on the **expected return of the investment**
- Estimated exit value is the key assumption

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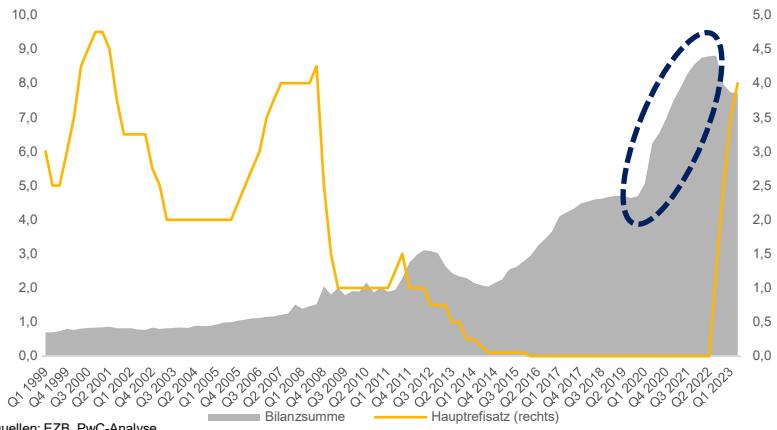
Marktentwicklung

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Bewertung von Anteilsgattungen

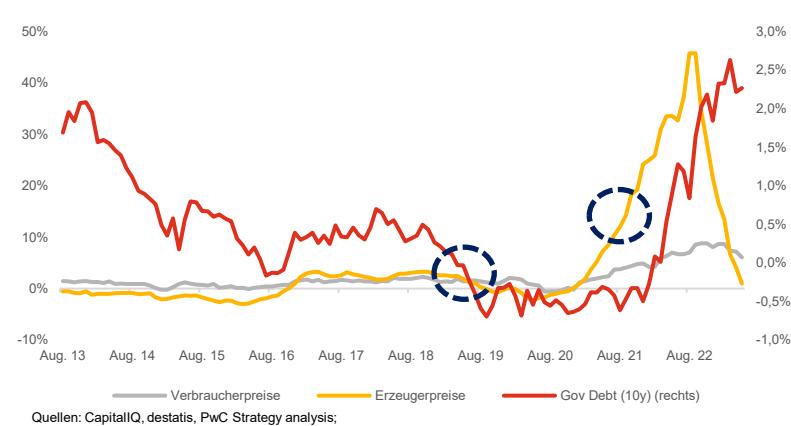
Makroökonomische Entwicklungen haben wesentlichen Einfluss auf Investitionsentscheidungen und Preise

Entwicklung der Bilanzsumme der EZB (in € Bil.)



Historische Preissteigerungen (Erzeuger-/Verbraucherpreise)

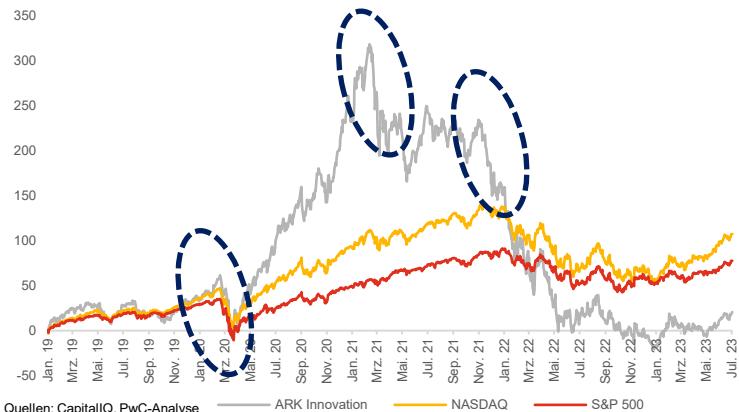
Deutschland, Veränderung zum Vorjahresmonat



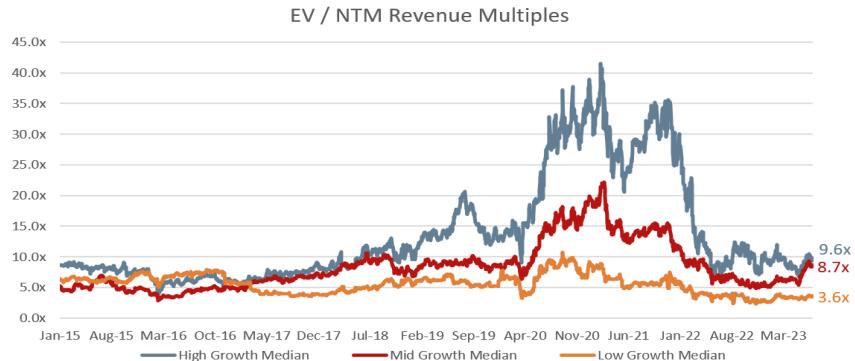
- Außergewöhnlich Liquiditätsflut über **globale Geld- und Fiskalpolitische** Interventionen treibt Asset Inflation
- Nach dem Lockdown hat sich die **angestauta Liquidität** zusätzlich in einer **starken Nachfrage** niedergeschlagen der ein insb. durch **gestörte Lieferketten geringes Angebot** ggü. Stand → Preise steigen
- Mit dem Ausbruch des Ukrainekrieges wurde dieser Trend massiv beschleunigt und die Notenbanken waren gezwungen die **Geldpolitik zu straffen**

Unsicherheiten führen zu Neubewertungen und geänderter Asset Allocation an den Börsen

S&P 500 Value vs. Nasdaq 100 vs. ARK Innovation ETF (Performance seit 2018)



EV/Umsatz-Multiplikatoren von Technologieunternehmen



Quellen: Substackcdn.com – Clouded Judgement

- Während „kostenlose“ Liquidität verfügbar war, lag der Fokus auf High Growth und kapitalkonsumierende Unternehmen
- Als Liquidität teurer wurde und das Marktumfeld von vielen Unsicherheiten geprägt war, wendeten sich Investoren Richtung besser prognostizierbaren Geschäftsmodellen mit positiven FCF

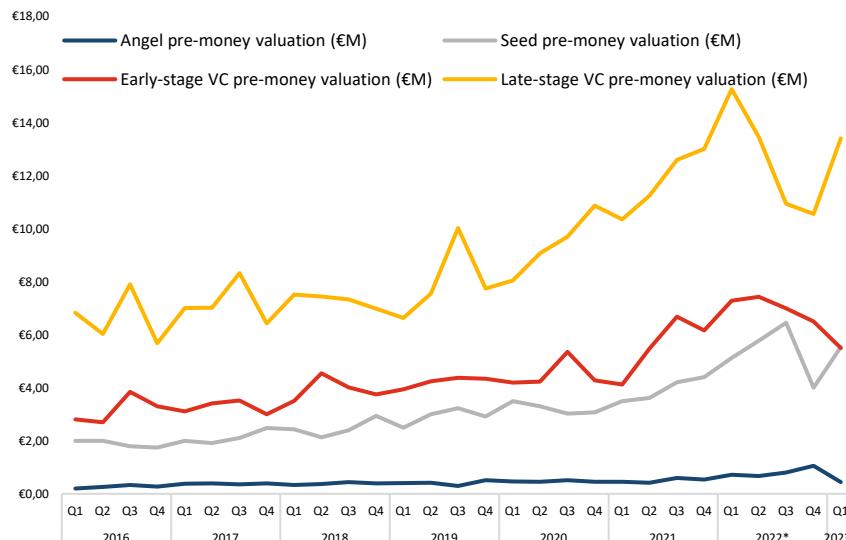
Cambridge Associates LLC US VC Index zeigt eine Korrektur von rd. 20%

US VENTURE CAPITAL										AS OF DECEMBER 31, 2022
FUND INDEX SUMMARY: HORIZON POOLED RETURN COMPARED TO CA MODIFIED PUBLIC MARKET EQUIVALENT (MPME)										
CA INDEX	1-QUARTER	1-YEAR	3-YEAR	5-YEAR	10-YEAR	15-YEAR	20-YEAR	25-YEAR		
CAMBRIDGE ASSOCIATES LLC US VENTURE CAPITAL INDEX ^{®1}	-6.87	-20.77	24.95	22.46	18.65	12.73	12.23	25.40		
MPME ANALYSIS ²										
Constructed Index: MSCI World/MSCI All Country World Index ³ (gross)		-17.61	4.06	5.49	8.54	5.60	8.54	6.77		
Value-Add (bps)		-316	2,088	1,697	1,011	713	369	1,863		
mPME Russell 2000® Index		-20.06	2.82	3.95	9.50	7.58	9.73	7.86		
Value-Add (bps)		-71	2,213	1,851	915	515	250	1,754		
mPME Constructed Index: NASDAQ Composite Price Index/NASDAQ Composite Total Return ⁴		-32.42	6.77	10.28	15.62	11.26	12.04	9.89		
Value-Add (bps)		1,165	1,818	1,218	303	147	20	1,551		

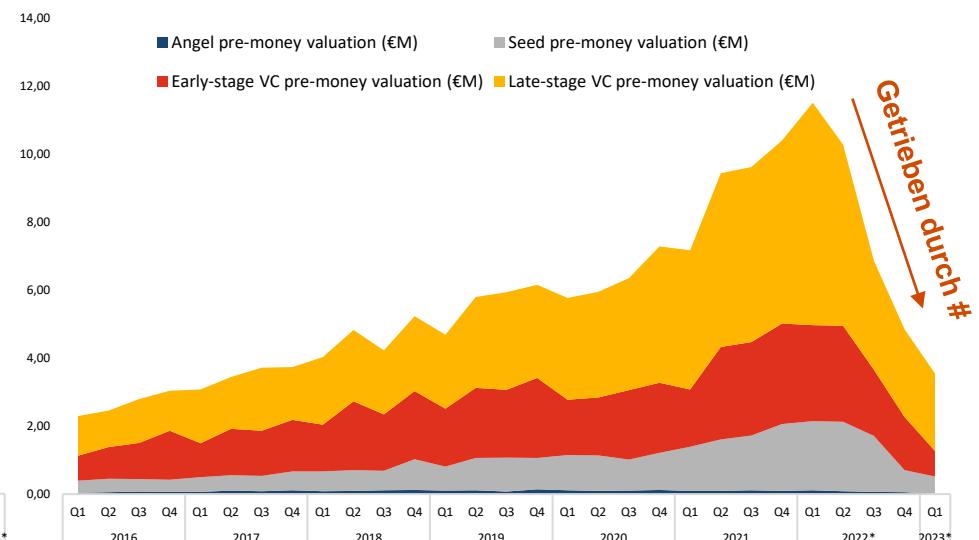
Quelle: <https://www.cambridgeassociates.com/private-investment-benchmarks/>

Relativ stabile Bewertungen bei rückläufiger Dealaktivität (#)

Median pre-money valuation



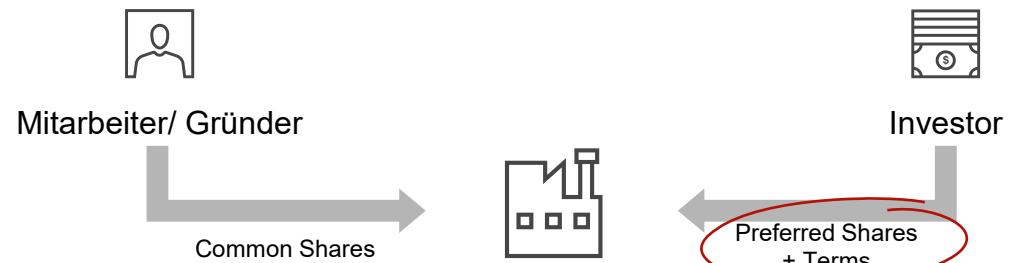
Volumen



Quelle: PitchBook, Geography: Europe, as of March 31, 2023

*"Viele im Topmanagement
haben keine Ahnung, dass ihre
Anteile de facto nichts mehr
wert sind"*

Quelle: <https://www.manager-magazin.de/unternehmen/tech/start-ups-und-lhre-beteiligungsprogramme-die-scheinmillionaere-aus-berlin-a-639aae64-64e7-44e3-9725-f1e7eef5ae5>



Beispiele:

ottonova

- Investment i.H.v. EUR 37m
- Terms: Liquidation Preference 4x
- Investorenexit: EUR ~148m (Preferred)

N26

- Investment i.H.v. EUR 780m
- Terms: LP auf Investment + 25% p.a.
- Exit nach 5 Jahren: EUR ~2,4mrd¹⁾ (Preferred)

Participating (= nicht anrechenbare) Liquidation Preference

Beispiel: "Waterfall" – Participating LP

100 Mio. €
 1. Rank (Series B)
 2x Investment
 - 2 Mio. €
 = 98 Mio. €

- 2 Mio. €
 2. Rank (Series A)
 1x Investment
 - 450,000 €
 = 97,550,000 €

All Shareholders
 (Series A, B,
 Common)

Investors	Investment	Shareholding	Shares	Proceeds	In%
Series B	1,000,000	10 %	5,000	11,755,000	11,8%
Series A	450,000	10 %	5,000	10,205,000	10,2%
Common	40,000	80 %	40,000	78,040,000	78,0%
TOTAL		100 %	50,000	100 Mio.	100%

Pro Rata

Series B	10 %	9,755,000
Series A	10 %	9,755,000
Common	80 %	78,040,000

Series B Investor
 Series A Investor
 Common

Proceeds je Anteil

2.351
2.041
1.951

Non Participating (= anrechenbare) Liquidation Preference

Beispiel: "Waterfall" - Participating LP

	Stufen	Total	Per Share	Total	Per Share	Participating	Per Share
		100.000.000	2.000	3.000.000	60		
1	Series B	2.000.000	400	2.000.000	400		
	Residualbetrag	98.000.000		1.000.000			
2	Series A	450.000	90	450.000	90		
	Residualbetrag	97.550.000		550.000			
3	Catch Up Common bis Series A Preis	3.600.000	90	550.000	14		
	Residualbetrag	93.950.000		0			
4	Catch Up Series A zu Series B	1.550.000	310				
	Residualbetrag	92.400.000					
5	Catch Up Common zu Series B	12.400.000	310				
	Residualbetrag	80.000.000					
	Pro Rata	80.000.000	1600				
	Total						
	Series B Investor	10.000.000	2.000	2.000.000	400	11.755.000	2.351
	Series A Investor	10.000.000	2.000	450.000	90	10.205.000	2.041
	Common	80.000.000	2.000	550.000	14	78.040.000	1.951

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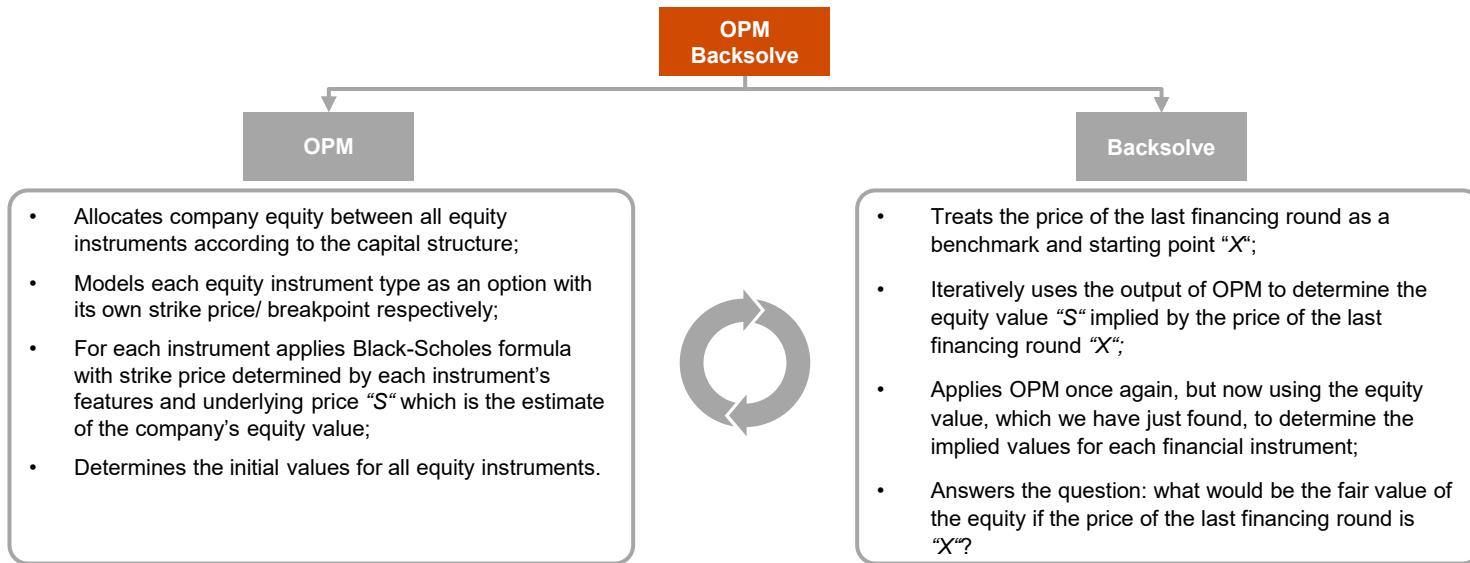
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Bewertung von Anteilsgattungen

OPM Backsolve

Overview

A capitalization table with the extensive description of all its equity instruments and their features serves as an input towards the OPM Backsolve model.



The price of latest financing round is only used as a **reference** to solve back for the implied equity value. It **IS NOT** the price of common shares.

Step 1 - Cap Table Analysis

Instrument	#Shares	OIP
Series C	18,000	€400
Series B	15,000	€200
Series A	12,000	€150
Seed	10,000	€100
Options	4,000	-
Commons	20,000	€1

Seniority	Dividend Rights	LP Multiple	LP / Share* BP	Total LP in €k	Total LP kum.	Strike Price	Conversion Rate	Participation Rights
1	8%	1x	€504	9,072	9,072	-	1:1	non-part.
2	8%	1x	€274	4,110	13,182	-	1:1	non-part.
3	8%	1x	€225	2,700	15,882	-	1:1	non-part.
4	8%	1x	€163	1,630	17,512	-	1:1	non-part.
residual	no	-	-			€175	1:1	-
residual	no	-	-			-	-	-

* LP / Share = OIP + cumulating dividends until exit

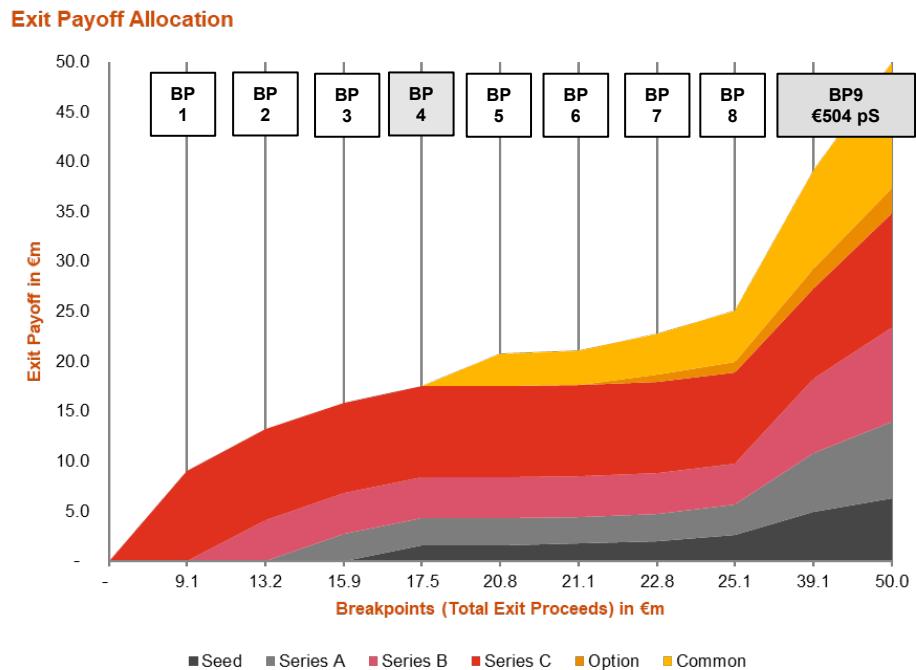


The **individual characteristics and features** of each equity instrument determine the future payoff profile. As the **payoff profiles differ** across the different instruments the respective **FVs have to differ** as well.

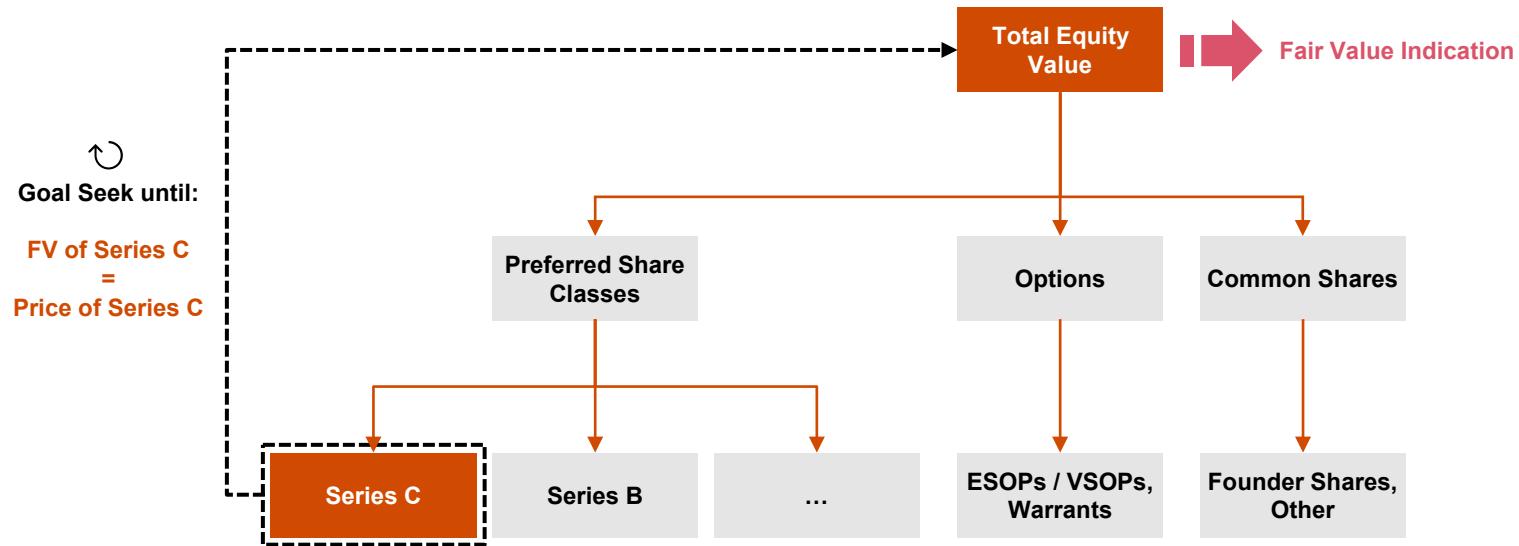
Step 2 - Modelling of the Waterfall-Scheme

Breakpoint Description

-	to	BP1	Series C LP is satisfied
BP1	to	BP2	Series B LP is satisfied
BP2	to	BP3	Series A LP is satisfied
BP3	to	BP4	Series Seed LP is satisfied
BP4	to	BP5	Common shares start to participate in value appreciation
BP5	to	BP6	After BP5 Seed shareholders are better off by converting into common shares (participation in value gain; LP is given up)
BP6	to	BP7	After BP6 options convert into common shares as strike price is exceeded
BP7	to	BP8	After BP7 Series A shareholders are better off by converting into common shares (participation in value gain; LP is given up)
BP8	to	BP9	After BP8 Series B shareholders are better off by converting into common shares (participation in value gain; LP is given up)
BP9	to	∞	After BP9 Series C shareholders are better off by converting into common shares (participation in value gain; LP is given up)



Step 3 - Iteratively Backsolve



OPM Backsolve vs. Fully Diluted Method

Example case (cont'd) | Step 4: Fair Value Derivation

Input Parameters

Black-Scholes

- Risk-free rate: 1.0%
- (Paid) dividend yield: 0.0%
- Volatility: 55.0%
- Time to exit: 3y

Additional Cap Table Information

- Latest round Series C at €400 share price
- Preferred share dividend yield: 8% p.a.
(annually compounding, cumulating)
- Non-participating preferred shares
- Different seniorities
- No LP multiples
- Conversion rates 1:1
(into common shares)

Results Summary

Fully Diluted Result

Instrument	Number of Shares	OIP / Strike (€)	FV per Share (€)	Total FV (€k)	% allocation
Seed	10,000	100	400	4,000	13%
Series A	12,000	150	400	4,800	15%
Series B	15,000	200	400	6,000	19%
Series C	18,000	400	400	7,200	23%
Option	4,000	175	400	1,600	5%
Common	20,000	1	400	8,000	25%
Total	79,000			31,600	100%

-54.9%

OPM Backsolve Result

Instrument	Number of Shares	OIP / Strike (€)	FV per Share (€)	Total FV (€k)	% allocation
Seed	10,000	100	105	1,049	7%
Series A	12,000	150	121	1,453	10%
Series B	15,000	200	157	2,360	17%
Series C	18,000	400	400	7,200	50%
Option	4,000	175	60	239	2%
Common	20,000	1	98	1,957	14%
Total	79,000			14,258	100%

OPM Backsolve Sensitivity

Different LPs (1,0 vs. 1,5 vs 2,0) and without Dividend

1,0 x Liquidation Preference

Instrument	# of shares	FV pS (€)	Total FV (€k)	% allocation
Seed	10,000	186	1.863	10%
Series A	12,000	198	2.378	13%
Series B	15,000	227	3.400	18%
Seriec C	18,000	400	7.200	38%
Option	4,000	110	439	2%
Common	20,000	182	3.634	19%
Total	79,000		18.913	100%

-40%

1,5 x Liquidation Preference

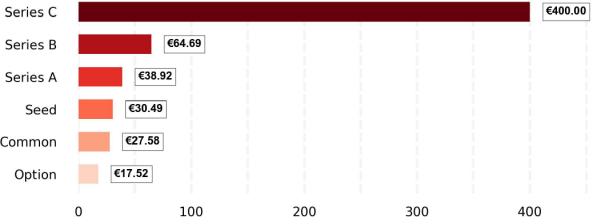
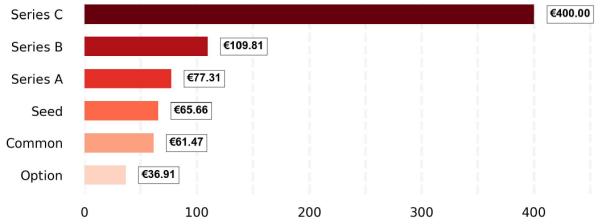
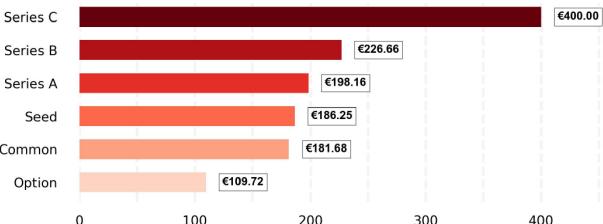
Instrument	# of shares	FV pS (€)	Total FV (€k)	% allocation
Seed	10,000	66	657	6%
Series A	12,000	77	928	8%
Series B	15,000	110	1.647	14%
Seriec C	18,000	400	7.200	61%
Option	4,000	37	148	1%
Common	20,000	61	1.229	10%
Total	79,000		11.809	100%

-63%

2,0 x Liquidation Preference

Instrument	# of shares	FV pS (€)	Total FV (€k)	% allocation
Seed	10,000	30	305	3%
Series A	12,000	39	467	5%
Series B	15,000	65	970	10%
Seriec C	18,000	400	7.200	75%
Option	4,000	18	70	1%
Common	20,000	28	552	6%
Total	79,000		9.564	100%

-70%



Fragen?



Daniel Pflaum
Director
Deals

daniel.pflaum@pwc.com
+49 151 728 182 54

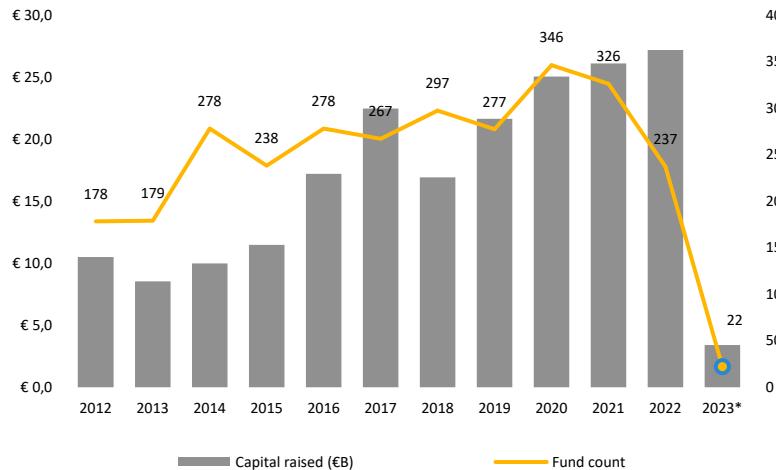


Peter Reubelt, CFA
Senior Associate
Deals

peter.reubelt@pwc.com
+49 151 184 438 43

Fundraising & Exits in Europa

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