IVC Snippets 2020/02

Focus: Liquidation preference when valuating start-ups

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IVC

Dear Reader,

in the current IVC Snippet we will analyse the effects of the liquidation preference on the company valuation.

Liquidation preferences are particularly popular in the valuation of start-ups. Preferred shares regularly have preferential claims from liquidation proceeds (liquidation preference).

If liquidation preferences exist, the price paid for shares cannot be used as a direct indicator of the total enterprise value. Conversely, the appropriate price for a share with/without liquidation preferences cannot be derived directly from the total enterprise value.

In the following, we will present a concrete valuation approach as to how the value of the shares with and without liquidation preferences can be derived from the enterprise value.

If you have further questions we will be at your disposal with solutions agilely, individually and personally.

With best regards from the „Ruhrgebiet"

Lars Franken and Jörn Schulte

IVC Snippets – Executive Summary

Background

- The challenge regularly arises from determining an adequate value for start-ups on different occasions.
- The value of the company is often determined in a simplified way on the basis of the price paid per (preferred) share in the last financing round before the respective valuation date. Conversely, an enterprise value is used to infer an appropriate price for a share.
- If shares are issued in the corresponding financing round with a so-called liquidation preference, the direct derivation of value is no longer possible.

Liquidation preferences

- Liquidation preferences prefer one or one group of investor(s) when selling his (their) shares or the company to ensure that his (their) investment in the start-up is profitable.
- A ranking order is agreed upon the payout: First, the preferred investor gets his investment back (then the next in line, etc.), before the remaining proceeds are then distributed among all shareholders - depending on the participation rate (Last in, first out).

Challenges

- In order to derive a company value from a completed financing round with liquidation preference for preferred shares, it is necessary to use option price models.
- In principle, the cash flow to the shareholders, which depends on the value of the company, is simulated using (several) options; the corresponding option components can then be determined using option price models (e.g. Black-Scholes or simulations).

IVC Snippets

- In the following, IVC will use a simple example to illustrate what is meant by the liquidation preference, what challenges arise from deriving value and how these challenges can be overcome.
- In particular, we will discuss how the payment structure of preferred shares can be determined and which financial instruments can be used to reflect the cash flows.

Characteristics of the liquidation preference

Key information

- **Liquidation preferences** regulate the distribution of the exit proceeds for holders of different shares (**share classes**).
- Regulations regarding the liquidation preference are usually specified in a **shareholders' agreement**.
- For example, a liquidation preference may include the following terms in the event of voluntary or compulsory **liquidation**, dissolution or winding up of the company:
  - The **preferred shareholders** are entitled to a **refund of their investment** before the other shareholders are satisfied. As a consequence, the proceeds are initially distributed among preferred shareholders. This refund comprises **at most the price paid** in the previous financing round.
  - Subsequently, the **remaining proceeds** are distributed among the **common shareholders** in proportion to their participation in the company until the common shareholders also receive the same proceeds per share as the previously satisfied preferred shareholders (catch-up of the non-preferred shareholders: "**catch up**").
  - Any further proceeds in excess of this amount will be distributed among all shareholders on a pro rata basis.

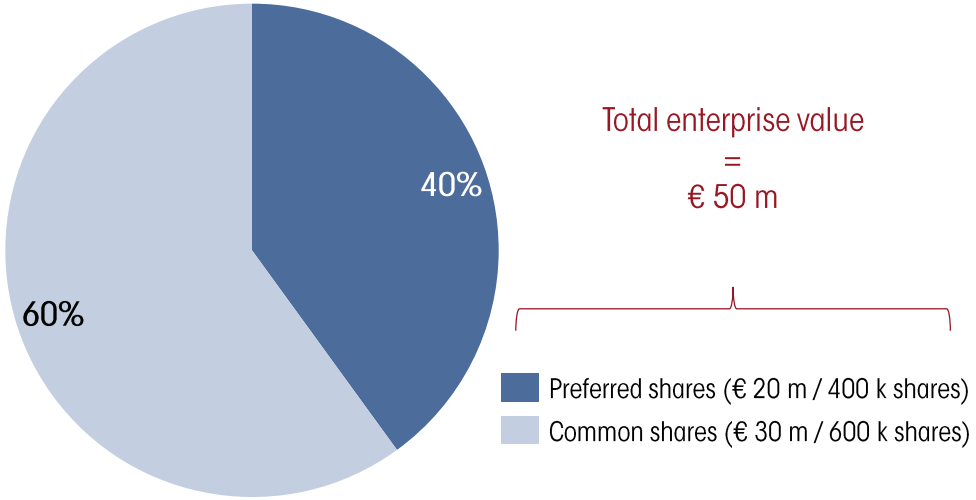
Numerical example

- On 23 December 2019, **VC AG** decided to increase its share capital from € 0.6 m by € 0.4 m to € 1.0 m. In the course of the capital increase only preferred shares were issued.
- After the capital increase the share capital is divided into **0.6 million common shares** (common shares - series A) and **0.4 million preferred shares** (preferred shares – series B).
- The 0.4 m preferred shares were acquired for an investment amount of **€ 50 per share** in cash (**total amount € 20 m**).
- The following effects can arise when issuing preferred shares
  - without liquidation preference or
  - with liquidation preference.

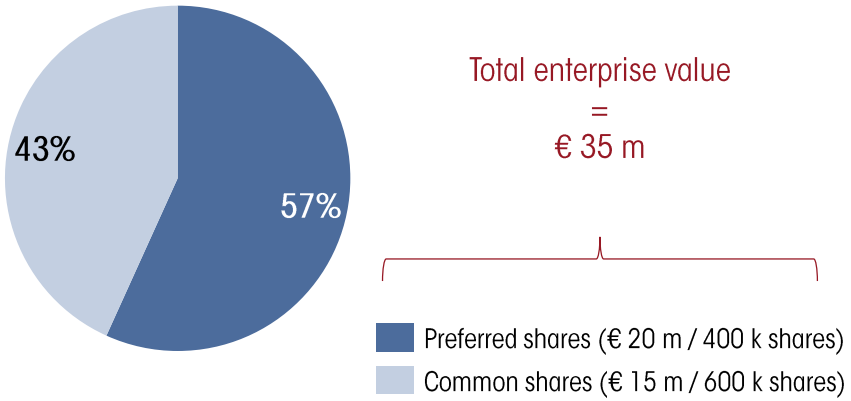
Highlight

/ In this present example, with the described liquidation preference and a price paid of € 50 per preferred share (total amount of € 20 m), e.g. for a volatility of 50%, a risk-free interest rate of -0.80%, and a remaining term / duration until the expected sale of 3 years, the **total enterprise value is approximately € 35 m**, so that the **value per common share is € 25.38**.

Without liquidation preference



With liquidation preference



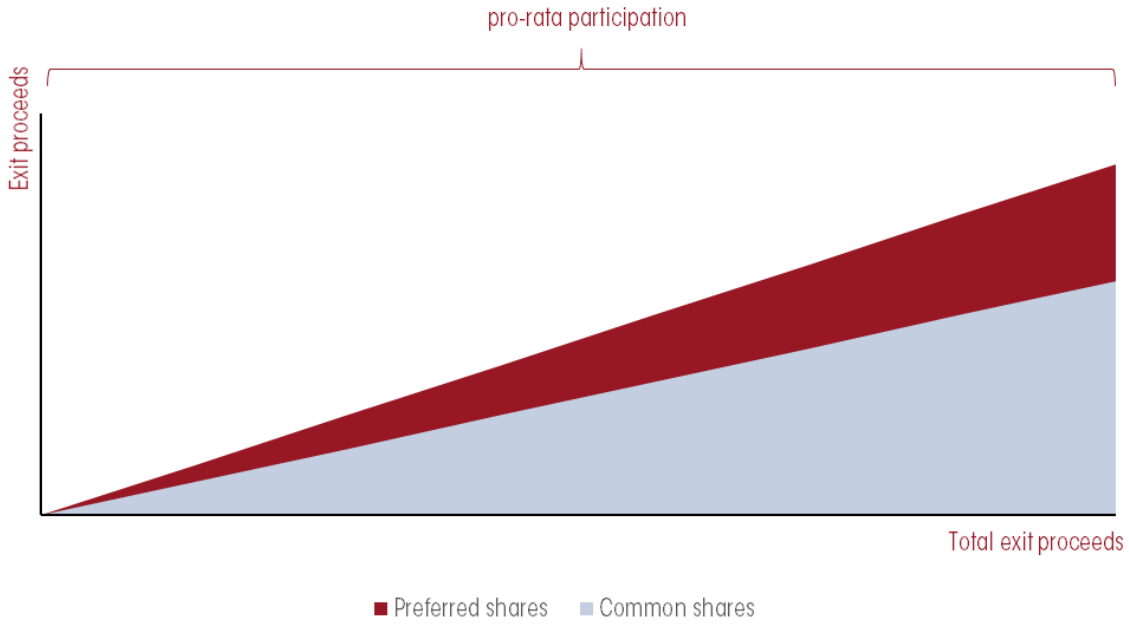
Taking into account the liquidation preference of preferred shares, the **company value** is thus **about 30%** lower than if the liquidation preference is disregarded

/ From an economic point of view, liquidation preferences **do not influence the operating value of the company**, but **affect the value of the underlying shares** and also all other shares. Once liquidation rights exist and shareholders are invested in different share classes, these **rights** should **be taken into account when valuing** these shares.

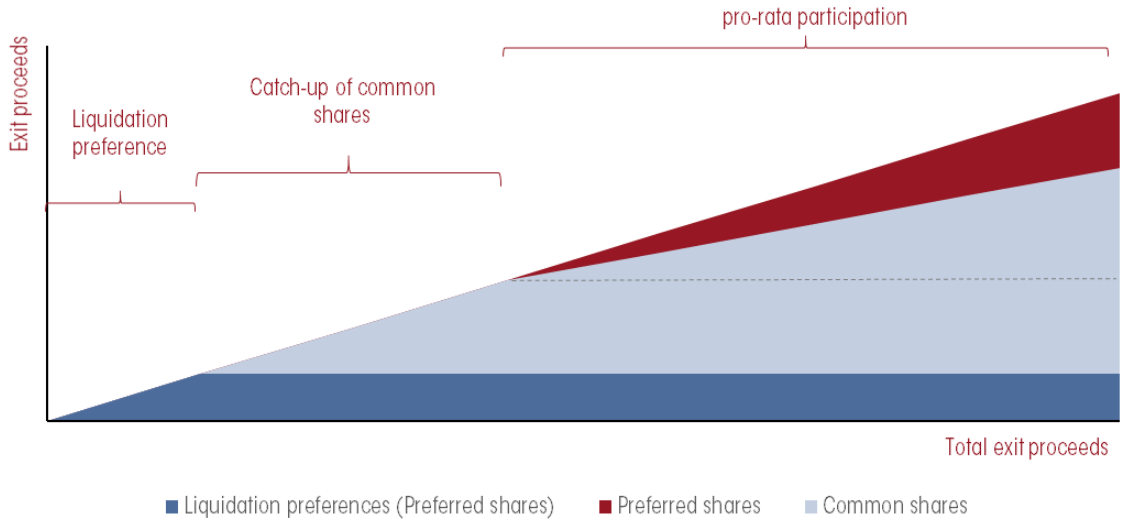
/ Conversely, the **company's value** cannot be determined by **simply multiplying** all shares by the price paid per (preferred) share in the presence of liquidation preferences. Liquidation preferences result in **incorrect (inflated) valuations** when the value of the shares, including liquidation preferences, is extrapolated to the value of the entire entity.

Payment structure of the preferred shares (I/III)

Without liquidation preference



With liquidation preference



- Without liquidation preference, the total exit proceeds are divided equally among all shareholders (left figure).
- With liquidation preference, the preferred shareholders first claim their contribution back (liquidation preference), then the common shares catch up, before a pro-rata participation finally takes place.

Payment structure of the preferred shares (II/III)

Cash flow sequence

- As a result, the proceeds up to a total amount of **€ 20 m** (400 k preferred shares x € 50) will initially be **divided among the preferred shareholders**.
- If the remaining proceeds exceed € 20 m up to a total of **€ 50 m** (=1,000 k [preferred + common shares] x € 50), the excess will first be divided **among the common shareholders.**

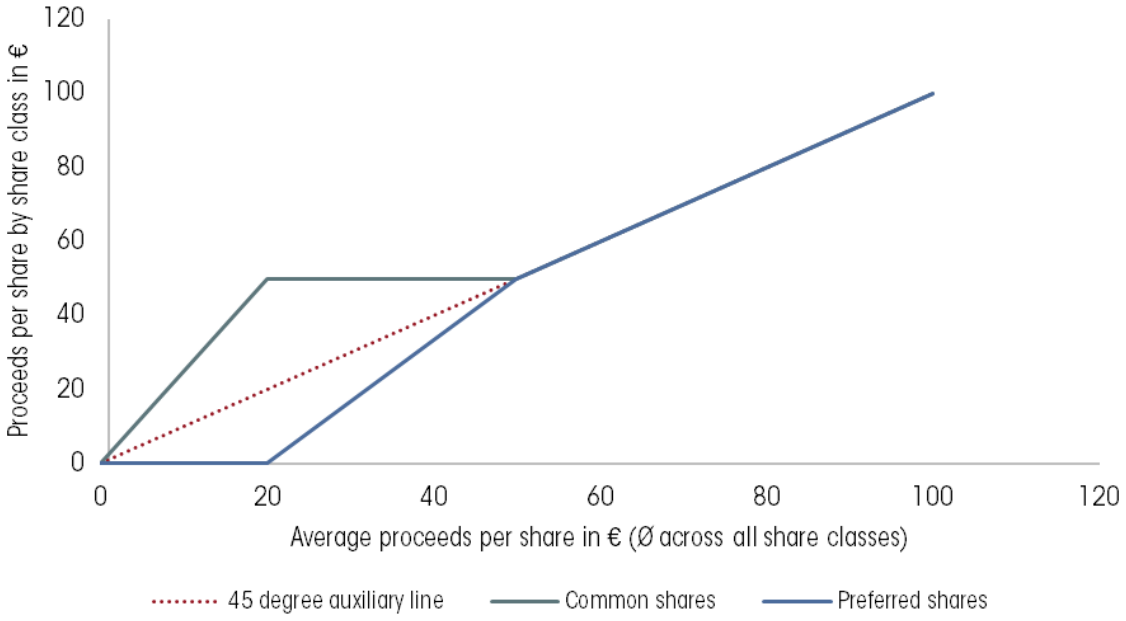
  The **common shareholders** will thus be reimbursed **up to an amount of € 50 per share** after the investment amount of the preferred shareholders has been claimed.
- The proceeds **exceeding € 50 m** will be allocated **among all shareholders**.
- Against this background, the value of one class of shares cannot (directly) be used to determine the value of the company as a whole.

Threshold values

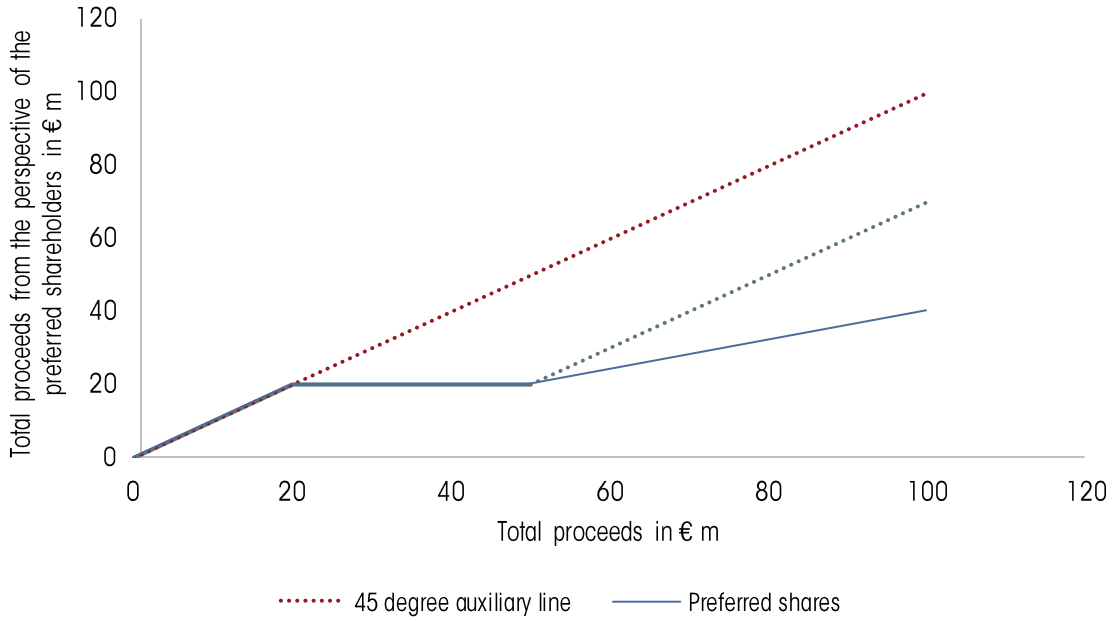
- At the first threshold (**threshold value 1 = € 20 m**), the repayment amount for a preferred share is € 50; the repayment amount for a common share is exactly € 0 (total enterprise value: € 20 million).
- In the middle of the two thresholds, the repayment amount per preferred share is still € 50; the repayment amount for a common share is € 25.
- Only above the second threshold (**threshold value 2 = € 50 m**) do the repayment amount per share equal each other.
- Accordingly, the repayment amount for preferred shares is higher or equal to the repayment amount for common shares under all circumstances.
- The next slide compares the different payment profiles of the share classes and summarizes the payment structure of preferred shares depending on the liquidation proceeds.

Payment structure of the preferred shares (III/III)

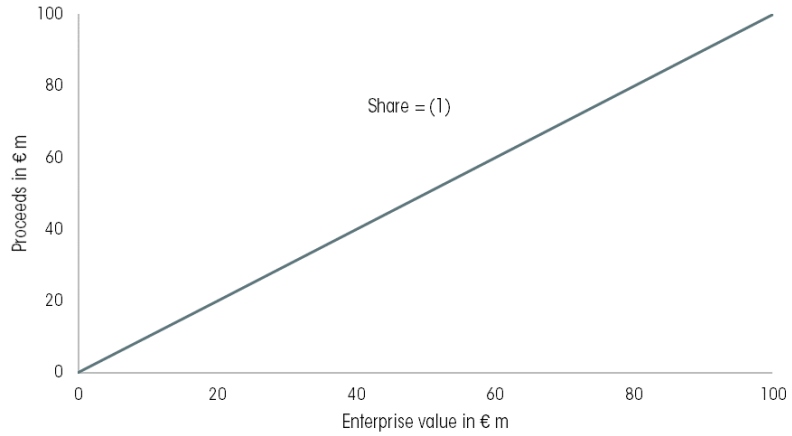
Proceeds per share class depending on the (total) proceeds per share



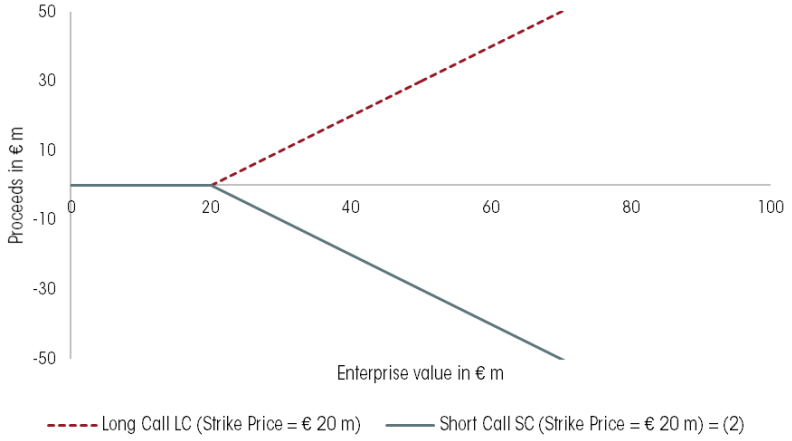
Total proceeds from the perspective of the preferred shareholders depending on the total proceeds



Valuation approach using (standard) financial instruments (I/II)

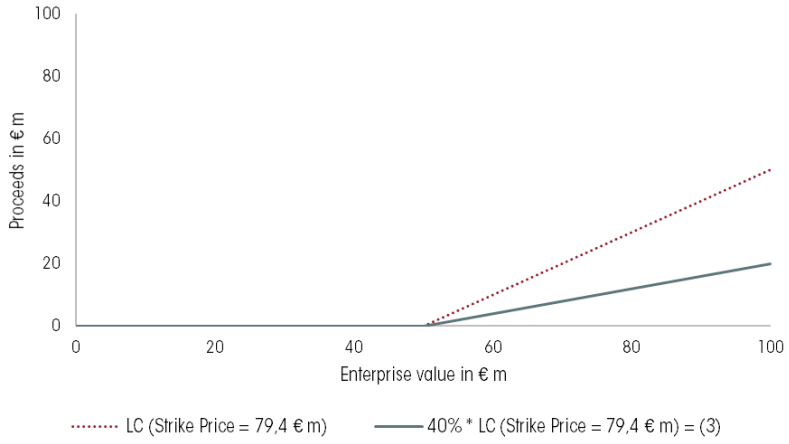


- Ultimately, the payment structure of preferred shares can be put together by **aggregating several financial instruments** and their cash flows.
- The first **financial instrument (1)** reflects the proceeds from the sale of all shares as the value of the company rises.
- The **value of the shares** thus corresponds to the **total enterprise value**.

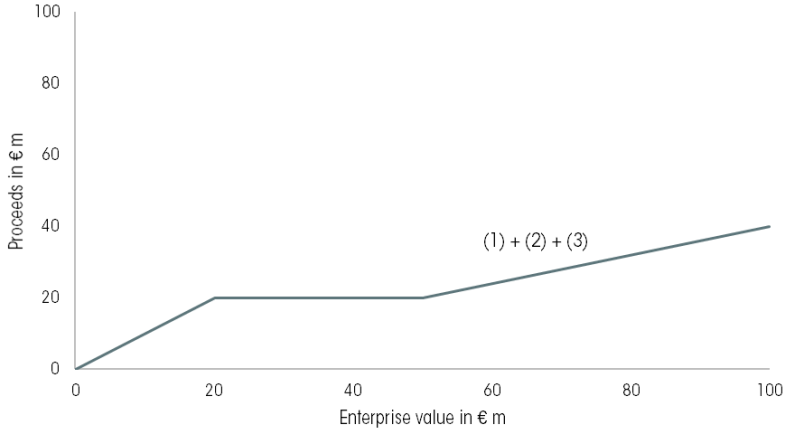


- The second **financial instrument (2)** is a call option from the writer's perspective (**short call, SC**). The value of a call option from the perspective of the writer corresponds to the negative value from the perspective of the holder of the call option (long call).
- When exercising the option, the writer of the option has the obligation to sell his shares (100% stake) or the company at the agreed strike price.
- For the valuation of the preferred shares, the **strike price** is set at the **threshold value** 1 in the amount of € 20 m.
- If the enterprise value exceeds the strike price, the value of this option is **negative** from the perspective of the writer. The difference between the share price and strike price represents the negative value or loss of the writer.

Valuation approach using (standard) financial instruments (II/II)



- The third **financial instrument (3)** is a call option from the perspective of the option holder (long call, LC).
- For the valuation of the preferred shares, the **strike price** is set at the **threshold value 2** in the amount of € 50 m.
- The holder of the call option exercises his option as soon as the enterprise value exceeds the strike price. The difference between the share price and strike price represents the value or profit of the option holder.
- In this case, only the value attributable to the holder of a call on the preferred shares is taken into account. The value of the call then corresponds to the pro rata value of the call on the total enterprise value. The **proportion of the preferred shareholders** in the present case amounts to 40 % (0.4 m preferred shares / 1 m preferred + common shares), i.e. the value of the call on the preferred shares is 40 % of the value of the call on the entire company.



- Aggregating the proceeds from the three financial instruments yields the payment structure of the preferred shares depending on the company value.
- Accordingly, the following relationship results for the company value from the perspective of the preferred shareholders or for the investment in the financing round (price for the preferred shares; V_{PS}):

$$V_{PS} = \text{Value of the company (1)} + \text{Value of the short call (2)} + \text{proportional value of the long call (3)}$$
$$= V_0 + SC + a \times LC$$

Valuation

Modeling

- The value of the preferred shares with a liquidation preference may be replicated from other financial instruments.
- This can be done on the basis of the financial instruments shares, short call and long call.
- The following relationship applies in principle:

$$V_{PS} = V_0 + SC + \alpha \times LC$$

- The value of the options can be determined by Black Scholes, for example.

$$LC = f(\text{Enterprise value}, \textbf{volatility, strike price, risk-free interest rate, remaining term}) = f(V_0, \boldsymbol{\sigma}, SP, r, T)$$

$$SC = -f(V_0, \sigma, SP, r, T)$$

Modeling

- Some parameters are well-known (design of the liquidation preference or strike price).
- The other parameters can also be
  - derived via the capital market (volatility, risk-free interest rate) or
  - estimated (remaining term until sale).
- If the enterprise value is to be deduced from the price of the preferred shares from the last financing round, the enterprise value V_0 remains the only unknown value in the system of equations that can be solved numerically (e.g. using the Excel solver).
- If the enterprise value V_0 is known (e.g. via a company valuation), the appropriate value in a financing round for the issue of new shares can be determined on the basis of the above equation.

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