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Functional business valuation – purpose is king!

1. Functional business valuation in the tension field between objective and subjective valuation theory

Determining the value of a company is one of the main tasks to be done in preparation for negotiations about an intended transfer of ownership (Hering 2021, pp. 5 f.). Both the prospective seller and the presumptive buyer, who are henceforth called **valuation subjects**, are interested in finding the value of the company in question (**valuation object**) in order to judge the economic adequacy of a given price in an emerging negotiation (Matschke, Brösel 2021, pp. 55 f.; Matschke et al. 2024, p. 141). Hereby, the purchase/sale promotes the interest of the potential buyer/seller as long as the price paid/received for the acquired/sold company does not exceed/is not less than the value associated with it (Hering et al. 2006, p. 407; Matschke et al. 2010, pp. 9 f.; Brösel et al. 2012a, p. 243). Then, the transaction causes no economic loss (Olbrich et al. 2015, p. 5; Herbener, Rapp 2016, p. 20; Follert et al. 2018, p. 319; Toll, Kintzel 2019, p. 1081).

While **objective business valuation theory** (Moral 1920; Mellerowicz 1952) pursues the futile quest for the one true value that must be generally valid for all parties, **subjective business valuation theory** (Käfer 1946; Busse von Colbe 1957; Münstermann 1966) focuses on the specific valuation subject, taking into account its personal intentions and expectations. Even further goes the **functional business valuation theory** (Matschke 1975; Sieben 1976; Moxter 1983; Hering

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2021; Matschke, Brösel 2021; Matschke et al. 2024), as being addressed in the present contribution, which stresses the significance of purpose orientation, by which means not only distinct, individual values with regard to distinct valuation subjects are presumed, but even diverging values for the same valuation subject depending on diverging purposes of valuation.

Subjective as well as functional business valuation theory are based on the principles of **subjectivity, future orientation and entity valuation** (Münstermann 1966, pp. 18–28; Hering et al. 2006, p. 408; Matschke et al. 2010, p. 3; Brösel et al. 2012a, p. 244; Olbrich et al. 2015, pp. 18–20; Herbener, Rapp 2016, pp. 14 f.; Matschke, Brösel 2021, pp. 11 f.; Brösel et al. 2023, p. 11), whereby the latter is supplemented by the principle of **purpose dependency** (Moxter 1983, pp. 5–8; Matschke et al. 2010, pp. 4 f.; Brösel et al. 2011, p. 31; Brösel et al. 2012b, p. 93; Olbrich et al. 2015, pp. 29 f.; Matschke, Brösel 2021, p. 11):

- Since business valuations are made from a specific decision-maker's point of view, for example, a presumptive buyer or seller, his target system – which discloses the will or ends – and decision field – which indicates the means and limitations – must enter into the valuation process, thus satisfying the presumption of **subjectivity** and allowing the determination of subjective marginal prices.
- According to the principle of **future orientation**, all expected future cash flows are attributed to a valuation object for a going-concern alternative. Past company earnings serve as nothing more than mere indicators for a prognosis of the projected future trend of earnings.
- Following the principle of **entity valuation**, a company as a whole business unit is viewed as an entity since synergy effects (positive as well as negative) may lead to a situation in which the sum of the values of all of its single assets may not mirror the entire value of the company.
- The principle of **purpose dependency** introduces a specific purpose as the basis for a determination of business values. Depending on a single task resp. intended function of business valuation, there can result "purpose-related" values, which are bound to specific intentions belonging to specific valuation tasks.

If the company valuation to be done aims at a transfer of ownership rights of a valuation object (i.e., a company), a distinction into main functions of functional company valuation is of the utmost importance. Three relevant main functions to be mentioned are the **decision function**, the **mediation function** and the **argumentation function**. Valuations that have no influence on existing

ownership rights fall into the realm of secondary functions (e.g., information function, taxation function, contract arrangement function), which are not discussed herein (Matschke, Brösel 2021, pp. 14 f.). Of chief interest are those three main functions and their assigned value concepts, which are characteristic for functional company valuations. Hence, in the present contribution, we would like to give a comprehensive overview to interested economists as well as practitioners concerning the basic concepts of functional company valuation theory as a viable alternative to mainstream valuation theory and practice, which is dominated by market-oriented procedures that belong to the so-called "younger objective valuation theory" due to their "neo-classical", finance-theoretical origin. However, the fact that a "unique" equilibrated and "objective market" value cannot exist in real valuation situations, even though persistently propagated by "finance theoreticians", is an immediate consequence of a functionally graded problem perception. To anchor those alternative valuation procedures, as offered by "functionalists", not only in valuation-theoretical literature but also in business practice, there is certainly a demand for an easily "digestible" overview. This is the motivation from which the relevance of the present contribution stems, whereby not only the ruling principles of functional company valuation are worked out in concise form, but also insights into useable valuation models, which are specific to each main function, are briefly discussed. All of this lies at the center of the following three sections. The contribution ends in Section 5 with a brief summary of the lessons learned.

2. The decision function in functional business valuation theory

The **decision function** is the most important main function, by which means a **decision value** – to be understood as a subjective marginal price for a company and, thus, the outermost limit of willingness of concession for a respective valuation party – is determined (Matschke 1975, pp. 26 f.; Matschke, Brösel 2021, pp. 13 f.). Since finance-theoretical valuation procedures disregard the individual target and decision field of a certain valuation subject, investment-theoretical and therefore individually suited procedures have to be applied for the determination of decision values, by which means individual conditions, as given for a certain valuation subject, are taken into consideration. In contrast to valuation methods based on finance theory, which abstract from the point of view of valuation subjects and presume an idealized, complete and perfect capital market, investment-theoretical

valuation methods have the advantage that decision-supporting assessments of cash flows are made possible, which are applicable under more realistic capital market conditions (Hering, Toll 2015, p. 15; Hering 2021, pp. 201–203, 306, 311; Matschke, Brösel 2021, pp. 13 f.).

To exemplify the valuation process for determining marginal prices in advance of an acquisition of a company under the condition of an imperfect capital market under quasi-certainty, the investment-theoretically well-founded state marginal price model (SMPM) is considered here (Hering et al. 2015, pp. 3 f.; Hering 2021, pp. 45–52). The procedure can be broken down into two main steps (see Fig. 1), namely the determination of the base and the valuation approach (Matschke, Brösel 2021, p. 65).

In the approach for the **base program** (step 1) it is assumed that there are no changes of ownership rights of the valuation object (Hax 1964; Franke, Laux 1968, p. 755; Matschke et al. 2010, pp. 13 f.; Lerm et al. 2012, p. 265; Hering et al. 2013, p. 42). Here, only the level of utilities is of interest which can be reached by a valuation subject if the intended purchase of the company is just not realized. Under this assumption, the very investment and financing program is to be calculated which **maximizes** the target function value (income *EN* or wealth *GW*) consistent with the target system of a given valuation subject. We can differentiate between the target of maximization of income and wealth, whereby income maximization is assumed in the valuation scenario presented below, i.e., the withdrawals at certain points in time t are governed by individual consumption preferences of the valuation subject. As additional constraints, we demand the satisfaction of liquidity conditions to ensure a continuous solvency of the valuation object. Thereby, we guarantee that at any time t the sum of the cash flows from the realized investment and financing objects as well as the balance of predisposed, decision-independent payments is not less than the desired withdrawals within each period.

Illustrated by the example of a company purchase, the valuation object (company) is now to be integrated into the previously established investment program of the presumptive buyer by formulating a corresponding **valuation approach** (step 2), in which the **maximum affordable price** is sought (Hering et al. 2015, p. 4; Hering 2021, p. 52). The presumptive buyer must determine the price he can afford to pay without the acquisition proving disadvantageous. In other words, the buyer has to know which price would not create a worse economic position than if he had refrained from the transaction. Hence, the valuation approach contains the additional constraint which demands that the maximal width of the income stream (EN^*), as has been determined in the base approach, is at least reached in the valuation program as well: $EN \geq EN^*$.

base approach	valuation approach	quantity constructs
max. Entn; Entn := EN	max. U; $U := p$	
$-\sum_{j=1}^{m} g_{j0} \cdot x_j \leq b_0$	$-\sum_{j=1}^{m} g_{j0} \cdot x_j + p \leq b_0$	
$-\sum_{j=1}^{m} g_{jt} \cdot x_j + \overline{w}_t \cdot EN \leq b_t$	$-\sum_{j=1}^{m} g_{jt} \cdot x_j + \overline{w}_t \cdot EN \leq b_t + g_{Kt}$	$\forall\, t \in \{1, 2, \dots, n\}$
	$-EN \leq -EN^*$	
$x_j \leq x_j^{\max}$	$x_j \leq x_j^{\max}$	$\forall\, j \in \{1, 2, \dots, m\}$
$x_j, EN \geq 0$	$x_j, EN, p \geq 0$	$\forall\, j \in \{1, 2, \dots, m\}$

Symbols: Entn := EN = width of the income stream; EN^* = maximum target function value of the base program; g_{jt} = cash flow of object j at point in time t; x_j = number of realizations of object j; $x_j^{\max}$ = maximally allowed number of realizations of object j; $\overline{w}_t$ = weighting factor for the width of the income stream at point in time t; b_t = fixed given autonomous payment at point in time t; $U := p$ = price of the valuation object; g_{Kt} = cash flow of the purchase object K at point in time t; n = planning horizon (number of planning periods); m = number of objects j

Figure 1. Base and valuation approaches of the SMPM

To determine the maximum affordable price p^* in a partial-analytical way, we can, under the presumption of known endogenous discount factors ρ_t resp. endogenous marginal interest rates i_t, apply a so-called **complex valuation formula** derived by means of the duality theory of linear optimization (Laux, Franke 1969, pp. 214–218; Hering et al. 2015, pp. 5; Toll, Kintzel 2019, p. 1088; Hering 2021, pp. 53 f.; Matschke, Brösel 2021, p. 130; Kintzel, Toll 2022, p. 1290). The following notation particularly emphasizes the relation to the future earnings value:

$$p^* = \underbrace{\sum_{t=1}^{n} g_{Kt} \cdot \rho_t}_{\substack{\text{future earnings}\\ \text{value of the}\\ \text{valuation object}}} + \underbrace{\sum_{t=0}^{n} b_t \cdot \rho_t + \sum_{C_j > 0} x_j^{\max} \cdot C_j - \sum_{t=1}^{n} \overline{w}_t \cdot EN^* \cdot \rho_t}_{\substack{\text{net present value difference due to restructuring}\\ \text{from base to valuation program}}}$$

with $\rho_t = \prod_{\tau=1}^{t} (1 + i_\tau)^{-1}$ = endogenous discount factors

and $C_j = \sum_{t=0}^{n} g_{jt} \cdot \rho_t$ = net present value of object j.

It is obvious that the **marginal price** p^* and the **future earnings value** don't necessarily match in imperfect capital markets unless the change in net present value by means of restructurings between the base and valuation programs vanishes. In this case, due to the identity of the marginal price p^* and the future earnings value E_K, the "complex" valuation formula can be transferred into a **simplified valuation formula**, which can be recast as follows (Laux, Franke 1969, pp. 210–214; Brösel et al. 2012a, pp. 245–249; Hering et al. 2015, pp. 5 f.; Olbrich et al. 2015, pp. 21 f.; Rapp et al. 2018, pp. 565–573; Hering 2021, pp. 55–57; Matschke, Brösel 2021, p. 131):

$$p^* = \sum_{t=1}^{n} g_{Kt} \cdot \rho_t = E_K = \text{future earnings value from the viewpoint of the buyer.}$$

3. The mediation function in functional business valuation theory

The second main function of functional valuation theory is the **mediation function**, by which means an arbitration value is determined that lies between the marginal values of both the prospective buyer and the seller. This value, e.g., introduced by an impartial arbitrator as an arithmetic mean of both marginal prices, should achieve a certain balance of interests for both conflict parties involved in a company transaction (Matschke 1979; Brösel et al. 2012a, p. 243; Olbrich et al. 2015, p. 31; Matschke, Brösel 2021, pp. 213–256). The anonymous market can also function as such an arbiter (Hering 2021, p. 6.).

If the conflict situation is **non-dominated** – which means no conflict party (buyer resp. seller) has the ultimate power to enforce the transfer of ownership rights against the will of the counterparty – the arbitration value serves different roles: It can be seen as a non-binding recommendation of an impartial arbitrator, as a possible starting point for further negotiations or as an actual accepted exchange value after a common initial cross-party agreement with regard to the validity of a valuation made by the arbiter. The higher the relevance of the imposed arbitration value for the conflict parties is, which means the stronger both parties are bound by the propositions of an independent authority, the more careful their related interests have to be considered, which are, so to speak, ultimately channeled into an arbitration value being put forward. Even though the governing decision values remain confidential, the arbitrator should do all he can to serve the interests of both parties in the best-possible way and should devote himself fully to the determination of an intersubjectively verifiable and justifiable, in the best case "fair", but in any case for all sides **acceptable** arbitration value.

If the arbitration value has merely a recommendatory character, the requirements for its determination are mitigated: The proposition of a basically acceptable potential interval of agreement, which may serve as a measuring metric or a starting point for further negotiations, is a non-binding recommendation and can, in the most extreme case, also lead to a cancelation of negotiations, which should be introduced by an arbiter as a possible outcome at the outset of negotiations.

As a particularly interesting application area of the mediation function, therefore remains the determination of an arbitration value as a certain kind of exchange value being subjected to stricter requirements. If the proposition for a compromise introduced by the arbitrator is stated as binding, the limits of willingness to concession of both parties must not be violated to fulfill the **postulate of rationality of actions** to lead to an acceptable resolution to a conflict solution for both sides. Hence, the existence of an arbitration area, which is spanned by the decision values of both parties, representing the presumptive area of agreement (see Fig. 2), is a basic prerequisite for non-dominated conflict situations (Matschke, Brösel 2021, pp. 215 f.).

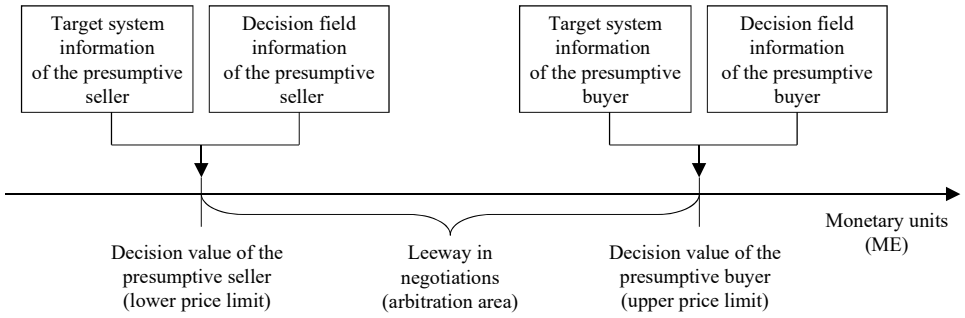

Figure 2. The area of agreement for the arbitration value

The starting point for the determination of an arbitration value to be proposed should be the decision values of both parties, which, however, are normally unknown to an impartial arbiter and could be estimated at best. For this purpose, the impartial arbiter puts himself in the position of both the buyer and the seller in the framework of a non-dominated acquisition-sale conflict situation to estimate their presumable target systems and decision fields as well as the respective subject-related future earnings associated with the valuation object as thoroughly as possible by applying a well-posed investment-oriented valuation procedure – like the state marginal price model (SMPM) as presented in Section 2, for instance. If an area of agreement and, thus, a possible arbitration value exists

that does not violate the limits of concession of both parties, the basic postulate of the rationality of actions is served justice.

In a second step, the arbiter has to turn his attention to the **postulate of party-related adequacy**. The conflict solution concerning the proposal of an arbitration value has to be based on a fairness postulate, which should lead to an acceptable and balanced agreement for both parties. As a possible distribution rule, **the rule of absolutely equal division** could be justified for which the difference between the buyer's upper price limit and the seller's lower price limit as the total distributable benefit is granted in exactly equal parts to both parties.

A thoroughly performed weighing of interests, which has to be done by an arbiter in the framework of a determination of arbitration values, is of the utmost importance in particular in those conflict situations in which changes of ownership rights can be enforced on the opposite party even against their will. Such a **dominated conflict situation** is further aggravated if there is no area of agreement, but the arbiter still has to assign an arbitration value. In the following, we present a special **model for the determination of an adequate cash compensation** to be chosen in the context of a "squeeze out" (Toll, Benda 2014, pp. 365 f.; Hering et al. 2019, p. 40), which illustrates the objective of the protection of minorities (here: the minority shareholder), when determining an arbitration value (here: in the form of a compensation). According to the regulation of Germany's Federal Court of Justice (BGH), only the maximum of both the stock market price and the future earnings value per share is eligible for compensation, which means, it should be considered as adequate to define an arbitration value.

The main parameters of the model are the cash compensation (*CC*) offered by the majority shareholder as well as the maximum minimal claim of the minority shareholders to be compensated ($\max\{MP; SV_j^{\min}\}$), which consists of the maximum of the **stock market price** (*MP*) and the corresponding share value as computed according to the future **earnings value method** ($SV_j^{\min}$). Thereby, $SV_j^{\min}$ is determined by the maximum of minimal claims of the individual minority shareholders *j*. For the party to be compensated, the following acceptable conflict solution results under the consideration of the fundamental assumption of the best alternative strategy: $\{CC \mid CC \geq \max\{MP; SV_j^{\min}\} \; \forall j\}$. The **decision value** of the minority shareholders in the case of a long-term holding strategy results as follows: Starting from the maximum width of the payout stream $EN^{\max}$ of the company in question in the initial situation (without squeeze out), it is determined which proportion of dividend payouts is attributable to each share: $D = (\beta \cdot EN^{\max})/N$. Thereby, $\beta \cdot EN^{\max}$ is the proportion of dividend payouts to be distributed to the minority shareholders, and *N* is the number of shares entitled to compensation. Furthermore, an unlimited time horizon for the going-concern

is assumed. To determine SV_j^{min} the annual proportion of dividend payouts for each share (D) is to be divided by the very interest rate (r_j), which is seen as the best alternative use from the minority shareholders' point of view to compute an individual present value according to the future earnings value method using the well-known capitalization formula for each share: $SV_j^{min} = D/r_j$. Since each minority shareholder has its own individual best alternative use, and since the maximum of all minimal claims is always relevant, the lowest alternative interest rate is assumed for each minority shareholder ($\min\{r_j\}$), which gives the highest share value. Hence, the following holds: $\max\{SV_j^{min}\} = D/\min\{r_j\}$.

The **adequate cash compensation** in the case of a non-existing area of agreement is then to be determined as follows (Toll, Benda 2014, p. 366; Hering et al. 2019, p. 40; Matschke et al. 2024, p. 652):

$$CC_{adequate} = \{CC \mid CC = \max_j\{MP; SV_j^{min}\}\} = \max\{MP; D/\min\{r_j\}\}.$$

4. The argumentation function in functional business valuation theory

The value concept that is most prevalent in business practice is the **argumentation value**, which is introduced in negotiations to enforce one's own negotiation position or to influence the opposite party (Matschke 1976; Brösel et al. 2012a, pp. 243 f.; Olbrich et al. 2015, pp. 32 f.; Matschke et al. 2020; Matschke, Brösel 2021, pp. 259 ff.). Since the cross-party objective for a negotiation aimed at a presumptive change in ownership rights is to reach a negotiation result that is as far away as possible from one's own limit of concession, a full position-strengthening rationale is channeled and cast into an argumentation value, disguised as an alleged decision value or purported impartial arbitration value.

Concerning the argumentation function, it is not only necessary to know one's own decision value, but also to have a perception of the decision value of the opposite party. Argumentation values can aim at occupying a more favorable position within the estimated area of agreement with **manipulative intent** or – following a more **cooperatively minted intent** – at a change or widening of an existing area of agreement, which enlarges the benefits for both parties in the case of an agreement. A widening of the area of agreement might come about by providing or underpinning information, which could lead the opposite party to adapt its decision value (Matschke, Brösel 2021, p. 266). Thereby, it is inevitable to convince the negotiation partner about the validity of the propagated information and the proposed value. In particular, methods used for valuation should be basically accepted by the recipient.

Currently, **valuation reports** made by auditors based on Anglo-Saxon valuation theory boast a high degree of credibility among practitioners. Even though they do not allow one to compute real decision values, they can certainly be used to introduce some kind of argumentation values during negotiations. Popular – besides the theoretically unfounded valuation by comparables – are the various **discounted cash flow** (DCF) **methods**, which are in fact based on unfirm foundations, but are held as almost sacrosanct by the majority of valuation addressees. The "text book formula", which predominates in Anglo-Saxon publications, is presented pars pro toto below, by which means so-called free cash flows (FCF^e) are discounted using a weighted average cost of capital (k = WACC) (for a comprehensive discussion see Olbrich et al. 2015, pp. 6–17; Hering 2021, pp. 266 ff.):

$$V = \frac{FCF^e}{k} = \frac{FCF + (1-s)\cdot i \cdot FK}{i_{EK}\cdot\frac{EK}{V} + (1-s)\cdot i \cdot \frac{FK}{V}}.$$

Symbols: FCF^e = expected free (gross = net) cash flow at the hypothesis of pure equity financing; k = weighted average cost of capital; FCF = expected free (net) cash flow; s = corporate tax rate; i = discount rate in a perfect market; FK = market value of debt capital ($FK = V - EK$); i_{EK} = expected rate of return of equity capital; EK = market value of equity capital ($EK = V - FK$); V = total company value in equilibrium ($V = EK + FK$).

5. Insight benefits of functional business valuation theory

The Anglo-Saxon capital market-oriented school of valuation, which pursues the futile quest for the one true value, has been confronted in the present contribution by the German school of functional business valuation. In view of the three previously addressed main functions, the purpose-dependency of valuation as well as their corresponding task-specific values clearly emerge in the previous sections. Beyond idealized model worlds, it should be stated that the "one and only" company value simply cannot exist. To try to find a solution to realistic valuation problems under the assumption of a perfect, complete capital market with perfect competition can confidently be classified as an aberration. The recent financial market crisis may serve as an indication for this statement. Since the capital market-oriented DCF methods propagated by Anglo-Saxon and internationally operating "investment banks" as having no alternative are associated with a welter of new problems (Hering 2021, pp. 273–290) due to a coupling

of incompatible finance-theoretical equilibrium models (capital structure models of Modigliani/Miller, capital asset pricing model and option pricing models), it is not surprising that many serious company crises were inflicted in the course of erroneous strategic company decisions caused by unrealistic company valuations. Although the North American investment banks were not the sole trigger of the financial market crisis that spread across the globe, they can at least be seen as a kind of "fire accelerant" (Brösel, Toll 2011; Brösel, Toll 2016, pp. 37; Hering 2021, pp. 341–343). To avoid such misdevelopments happening again, researchers are called upon to stand up firmly as a critical corrective instead of being hired out as pure "henchmen" of North American consulting firms (Brösel, Toll 2016, p. 43). Thus, valuation theory and practice must be made more aware of the fact that functional company valuation theory allows one to deliver valuation approaches that can bridge the gap between the diversities of individual valuation situations and is more narrowly oriented toward the reality of everyday business practice, particularly due to its core principle of purpose dependency being operationalized by the main functions, as explained in the present contribution. The supporting pillars of the school of functional company valuation theory emerge clearly through its main functions, which reflect the inherent complexities within valuation situations, by which means they can be appropriately resolved and analyzed at all in the first place (Hering 2021, pp. 7 f., 14, 201–203, 327–347).

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Summary

In the present contribution, we discuss the basic principles of functional business valuation. In addition to a distinction between objective and subjective valuation theory, the differences between finance-theoretical and investment-theoretical valuation approaches are worked out. The core of our discussion is devoted to an overview of the three main functions and value concepts of functional business valuation theory.

JEL codes: C78, D46, G31, G34

Keywords: *functional business valuation, decision function, mediation function, argumentation function*