Three comments on Schmautz/Lampenius, Net value created: measuring a non-life insurer's performance, ZVersWiss (2013), 237-255

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The paper of Schmautz/Lampenius consists of two parts. First, the authors describe the performance measure Net Value Created (NVC). The concept is then applied to an insurance company. We have two comments on the first part and one on the second part.

Comment 1: NVC is not new and the formulae used by Schmautz/Lampenius, also the adaptation to FTE, are not new

If a scientific paper is written for instance about the application of a concept like a performance measure, the authors are required to clarify the origin of that concept and the underlying framework. There are two possibilities: the authors have developed that measure or the measure has been developed before. The second explanation holds true here. Based upon contributions of others we:

- coined the term Net Value Created (NVC) and developed the concept behind that performance measure,
- formulated NVC both with cash flows and residual incomes for *all* DCF approaches (APV, WACC, TCF *and* FTE),
- showed the interactions between the DCF approaches in the NVC concept, uncovered related pitfalls and provided respective solutions, and
- developed the formulae and the approach in terms of interpreting and splitting it into different components, i.e. the realized deviation from expectations and the revision of expectations.

In all the articles and working papers on the subject we listed all the previous articles important for that field of research, i. e. O'Hanlon/Peasnell (2002) and many others.

In literature it is widely accepted that some terms like CAPM and DCF are common knowledge which might not make it necessary to quote the original sources each and every time. However, after working years on the subject we are well aware that our concept of NVC has not become common knowledge (yet). Table 1 lists the formulae used in Schmautz/Lampenius (2013) and their origin in our research without claiming to cover all possible sources. Again, references to related work by others are listed in our papers.

Formula No. in Schmautz/ Lampenius	Sources
1	Common knowledge
2	NPV as difference between market value and (properly defined) invested capital: Schueler/Krotter (2004), Schueler/Krotter (2008), Schueler/Bauer/Krotter (2008)
3	For the definition of invested capital, e. g.: Drukarczyk/Schueler (2000), S. 265; Schueler (2000), Schueler (2001), O'Hanlon/Peasnell (2002) as cited by Schmautz/Lampenius, Schueler/Krotter (2004), Schueler/Bauer/Krotter (2008), Drukarczyk/Schueler (2009) Chapter 10
4	Common sense, shown in many of the sources cited above and below
5	Equation (3-5) in Schueler/Bauer/Krotter (2008) No difference to Equation (79) in Krotter (2009)
6	e. g. Equation (5) in Schueler/Krotter (2004)
7	Only minor difference to Equation (74) in Krotter (2009), incorrect application of $r_{Lt\|t}$ (see Comment 2) See also sources listed for Formula No. 9 in Schmautz/Lampenius
8	Only minor difference to Equation (76) in Krotter (2009), incorrect application of $r_{Lt\|t}$ (see Comment 2)
Fig. 1	Similar to Figure 11 in Krotter (2009)
9	Second term in (9) wrong due to Cost-of-Capital-Effect which does not exist (see Comment 2) (4-18) in Schueler/Bauer/Krotter (2008) Almost identical to formula in Table 16 in Krotter (2009) (10-5) and (10-6) in Drukarczyk/Schueler (2009)
10	Common sense
11, 12	Wrong due to Cost-of-Capital-Effect which does not exist (see Comment 2)
13, 14	Common knowledge
15	Figure in Schueler (2001) O'Hanlon/Peasnell (2002) as cited by Schmautz/Lampenius Equation (1) in Schueler/Krotter (2008) (4-19) in Schueler/Bauer/Krotter (2008) (10-16) in Drukarczyk/Schueler (2009)
16	Wrong due to Cost-of-Capital-Effect which does not exist (see Comment 2)

	Equation (2) and (11) in Schueler/Krotter (2008) Formula in Table 23 in Krotter (2009) (10-16) in Drukarczyk/Schueler (2009)
17	Wrong due to Cost-of-Capital-Effect which does not exist (see Comment 2)

Table 1: Formulae used by Schmautz/Lampenius

Comment 2: There is no Cost-of-Capital-Effect – neither in FTE, nor in WACC, TCF and APV

Schmautz/Lampenius claim that

i. "to our knowledge […] NVC has solely been applied in an APV or WACC framework" and
ii. due to i., „the deviations resulting from different cost of capital rates ($r_{L,t|t}$ and $r_{L,t|t-1}$), driving $\Delta CoC_{t|t}$" have not been discussed before.

Point i. implies that the adaptation of NVC to the FTE concept is new. It is not, as the literature referenced in Table 1, e. g. in Schueler/Krotter (2004) and Schueler/Bauer/Krotter (2008), develops the formulae for all DCF approaches *including* FTE.

According to Schmautz/Lampenius, $\Delta CoC_{t|t}$ is part of the realization component of NVC and displays "the deviation of ex-ante planned and ex-post realized Cost of Capital (*CoC*)" in period *t* "generated through a change in capital structure": With $NPV_t = E_{L,t} - IC_t$, it follows:

$$\Delta CoC_{t|t} = \left(r_{L,t|t} - r_{L,t|t-1}\right)\left(IC_{t-1|t-1} + NPV_{t-1|t-1}\right) = \left(r_{L,t|t} - r_{L,t|t-1}\right)E_{L,t-1|t-1} \quad (1)$$

Thus, the deviation of the cost of capital in *t* – according to Schmautz/Lampenius – is driven by the difference in expected and realized cost of equity in *t* on the prior period's equity market value in *t-1*, caused by a change in capital structure. The authors use the ex-post cost of equity $r_{L,t|t}$ for carrying forward prior period's invested capital to determine the invested capital in *t*:[1] $IC_{t|t} = IC_{t-1|t}\left(1 + r_{L,t|t}\right) - CF_{t|t}$.

Thereby Schmautz/Lampenius assume a perfect hindsight perspective without noticing it, although they acknowledge that prior period's invested capital ex post is identical to its ex ante value ($IC_{t-1|t} = IC_{t-1|t-1}$). An opportunity driven investor could sell his investment at market value $E_{L,t-1|t-1}$ and with an accumulated invested capital $IC_{t-1|t-1}$, thus the investor could have realized $NPV_{t-1|t-1}$. What is then the expected net present value in period *t* based on the

[1] See the Appendix in Schmautz/Lampenius (2013), p. 253, for the derivation of (9).

information in *t-1*, $NPV_{t|t-1}$? For deriving the expected equity value $E_{L,t|t-1}$, only ex-ante cost of equity $r_{L,\cdot|t-1}$ are to be applied (see also Schmautz/Lampenius, formula (10)):

$$E_{L,t|t-1} = \sum_{i=t+1}^{\infty} CF_{i|t-1} \prod_{j=t+1}^{i} \left(1 + r_{L,j|t-1}\right)^{-1} \qquad (2)$$

Likewise, the ex-ante expected cost of equity has to be used to carry forward invested capital:

$$IC_{t|t-1} = IC_{t-1|t-1}\left(1 + r_{L,t|t-1}\right) - CF_{t|t-1} \qquad (3)$$

Applying the ex-post cost of equity $r_{L,t|t}$ in the above formula used by Schmautz/Lampenius implies the hypothetical question what invested capital the investors would have expected to be recovered in *t* by CF_t and $E_{L,t}$ if the ex-post cost of equity (after a change in the capital structure) had already been available in *t-1*. Obviously, this is nonsense as the investor neither could process anything else in *t-1* than the information available in *t-1* nor could he trade his investment based on the ex-post cost of equity unknown in *t-1*.[2]

In addition, it can be shown straight forward that there can be no such thing as $r_{L,t|t}$ "generated through a change in capital structure" as the levered cost of equity for period *t* depend upon the market value of equity (*E*) and debt (*D*) in *t-1*. This is known since Modigliani/Miller (1958), (1963). Starting with the unlevered cost of equity (r_U) and assuming constant unlevered cost of equity and a constant risk free rate of return (r_F) we get:

$$r_{L,t} = r_U + \left(r_U - r_F\right)\frac{D_{t-1}}{E_{t-1}} \qquad (4)$$

Thus, it is impossible to assume anything else then $r_{L,t|t} = r_{L,t|t-1}$ or more explicitly: there is no $r_{L,t|t}$.

Finally, if the deviation of the cost of capital realized in *t*, $\Delta CoC_{t|t}$, did exist, it would not solely surface in the FTE approach, but in any performance measurement system with discounted cash flows or residual incomes that incorporates revised expectations and period specific discount rates. However, the realized deviation of the cost of capital does not show up in the WACC and FTE applications of NVC e.g. in Schueler/Bauer/Krotter (2008), Bauer (2008) and Krotter (2009), due to the simple reason that it does not exist. The warning issued by Schmautz/Lampenius (last line on p. 244) lacks any substance.

[2] See already Hicks (1946), p. 177, where Prospect I and II denote the ex-ante and ex-post point of view: „But to inquire whether I on the first Monday is preferred to II on the second Monday is a nonsense question; the choice between them could never be actual at all; the terms of comparison are not *in pari material*". Krotter (2009), p. 79-81, proves the irrelevance of the alleged finding of Schmautz/Lampenius using residual incomes on market values.

Comment 3: Schmautz/Lampenius assume a value destroying insurance company

The example used by Schmautz/Lampenius is severely flawed and should not be used. Before we illustrate the flaws in their example it should be pointed out that the authors – despite delivering data and formulae for periods t = 1 to t= 3 – use a perpetuity setting with an uniform growth rate right from the start, thus avoiding any challenges a more realistic forecast setting with varying figures might impose. The advantage is that their example can be analyzed in a few paragraphs:

Beside omitting to point out that treating provisions to be free of capital charge is only consistent with the Preinreich/Luecke-Theorem for provisions built up after the value based performance measurement starts (see Drukarczyk/Schueler 2002), they assume either a value destroying asset management or a value destroying insurance business or both.

It is useful to assign cash flows and present values to the two business units, insurance and asset management, in order to shed some light on the implied economic reasoning. First, as Schmautz/Lampenius we use the overall cost of capital (11.52 %) for valuing both units. What is the value for the assets under management? It is the return after tax, i. e. 3 % · (1 – 15 %) = 2.55 %, on 150 which is 3.825. The increase in assets managed of 2.25 in t = 1 has to be considered, too. The cash flow from asset management is therefore 1.575 and grows by 1.5% per year. Thus, the value of that business unit using the overall cost of equity is:

$$\frac{1.575}{0.1152 - 0.015} = 15.72 \qquad (5)$$

The company has invested 150 in assets, which generate a cash flow worth 15.72. Of course, this enormous waste of value depends upon the huge gap between rate of return and cost of capital. We will come back to that problem.

The insurance unit generates 5.075 pretax and 4.539 after taxes including the tax shield on the increase in reserves (0.15 · 1.5 = 0.225). That cash flow grows by 1.5%, too. Its present value is:

$$\frac{4.53875}{0.1152 - 0.015} = 45.3 \qquad (6)$$

The sum of the cash flows equals 6.11 and its present value is 61.02. Both numbers are also derived by Schmautz/Lampenius.

Note that t = 0 cannot be the foundation date of the insurance company due to the then already existing 100 of loss reserves. Consequently, 50 currency units are not the carry forward of

paid in equity capital as Schmautz/Lampenius assume but the *book value* of equity, where the difference between the two are the accumulated past capital charges on invested capital. So what might shareholders think about management's performance? Should they agree to a generous bonus payment because 61.02 is higher than 50, the *book value* of equity? They should not do that, but think about severance payments instead. It depends upon the unit specific cost of capital which managers should be fired.

To illustrate that, we assume first that the assets under management earn their cost of capital pretax (3 %) implying that there is no free lunch on the capital market and private investors can earn that rate, too. Equation (5) has to be rewritten as:

$$\frac{1.575}{0.03-0.015}=105 \qquad (7)$$

The value of the assets under management is higher than the 15.72 calculated previously, because the gap between the rate of return and cost of capital has diminished. It is lower by 45 than the investments of 150 because of the tax disadvantages of investing on the corporate level as there are no taxes on the investors' level. This is the counterpart of the well-known positive tax shield on debt financing. The difference of 45 can be explained by the tax disadvantage which grows by 1.5 % at infinity:

$$\frac{0.15\cdot 0.03\cdot 150}{0.03-0.015}=45 \qquad (8)$$

Considering the value of the assets of 105, the value of equity of 61.02 can only be explained by a negative value of the insurance business. If one might argue by violating fundamental principles of finance, that the asset managers are able to beat the capital market forever and compensate for the tax disadvantage, the value of the assets would be 150. Then, in order to make another effort to justify the value of equity of 61, the value of the insurance business must be even more negative. Suppose instead that the owners force managers to stop investing in assets and payout the proceeds instead. That it is possible in the example of Schmautz/Lampenius as cash inflows generated by insurance premiums exceed cash outflows due to payouts for claims in every period. It would benefit the shareholders immediately.

Obviously, all those different approaches can not save the flawed example of Schmautz/Lampenius. Summing up our third comment: Schmautz/Lampenius assume a value destroying company without even noticing it.

References

Bauer, G. (2008): Wertorientierte Steuerung multidivisionaler Unternehmen über Residualgewinne, Frankfurt, Berlin, New York.

Drukarczyk, J./Schueler, A. (2000): Approaches to Value-Based Performance Measurement. In: Value-based Management: Context and Application, Arnold/Davies (editors), Chichester, New, York, pp. 255–303.

Drukarczyk, J./Schueler, A. (2002): Rueckstellungen, Verwendungsentscheidungen und Nettokapitalwert. In: Jahrbuch für Controlling und Rechnungswesen 2002, Seicht (editor), Wien, pp. 309–328.

Drukarczyk, J./Schueler, A. (2009), Unternehmensbewertung, 6th edition, Muenchen.

Hicks, J. (1946), Value and Capital – An Inquiry into some Fundamental Principles of Economic Theory, 2nd edition, Oxford.

Knoll, L. (1996): Das Luecke-Theorem. In: Das Wirtschaftsstudium, Vol. 25, pp. 115–117.

Krotter, S. (2007): Zur Relevanz von Kongruenzdurchbrechungen für die Bewertung und Performance-Messung mit Residualgewinnen. In: Die Betriebswirtschaft, Vol. 67, pp.692–718.

Krotter, S. (2009): Performance-Messung, Erwartungsaenderungen und Analystenschaetzungen, Muenchen.

Luecke W. (1955): Investitionsrechnung auf der Basis von Ausgaben oder Kosten?“ In: Zeitschrift für handelswirtschaftliche Forschung, Vol. 7, pp. 310–324.

Modigliani, F./Miller, M. H. (1958): The Cost of Capital, Corporation Finance and the Theory of Investment. In: American Economic Review, Vol. 48, S. 261–297.

Modigliani, F./Miller, M. H. (1963): Corporate Income Taxes and the Cost of Capital – A Correction. In: American Economic Review, Vol. 53, S. 433–443.

O'Hanlon, J./Peasnell, K. (2002): Residual Income and Value Creation: The Missing Link. In: Review of Accounting Studies, Vol. 7, pp. 229–245.

Preinreich, G. (1938): Annual Survey of Economic Theory: The Theory of Depreciation. In: Econometrica, Vol. 6, pp. 219–241.

Schueler, A. (2000): Periodische Performance-Messung durch Residualgewinne. In: Deutsches Steuerrecht, Vol. 38, pp. 2105-2108.

Schueler, A. (2001): Jahresabschlussdaten und Performance-Messung. In: Jahrbuch für Controlling und Rechnungswesen 2001, Seicht (editor), Wien, pp. 141–158.

Schueler, A./Bauer, G./Krotter, S. (2008): Messung antizipierter und realisierter Performance mit Cash Flows und Residualgewinnen. In: Zeitschrift für Controlling und Management, Vol. 52, pp. 336-345.

Schueler, A./Krotter, S. (2004): Konzeption wertorientierter Steuerungsgroessen: Performance-Messung mit Discounted-Cash-flows und Residualgewinnen ex ante und ex post. In: FinanzBetrieb, Vol. 6, pp. 430–437.

Schueler, A./Krotter, S. (2008): The link between residual income and value created for levered firms: A note. In: Management Accounting Research, Vol. 19, pp. 270–277.