APPROACH TO DETERMINE THE VALUE OF TWO COMPANIES WHICH EACH HAS AN INVESTMENT IN THE OTHER

When you have to determine the value of a company, all assets need to be valued at a fair market value. Liabilities are generally taken over or settled at their book values, unless information in the question states otherwise.

A problem arises when one company has an investment in another and that other company has, in turn, an investment in the first company.

The problem in a situation like this is that one cannot place a final value on either company because the market values of the investments in each other are unknown. You would find that the book value of the investment seldom reflects the current market value thereof.

At this point, let's base our discussion on the example starting at the bottom of page 99 of the study guide, and continuing on page 100. It's about Dox and Sox – does that sound familiar?

The **first step** in **determining the total value** of a company would be to determine the total monetary value of the company, **excluding the value of its investment** in the other company. It is important to ensure that the **market value of the investment** in the other company is the **only outstanding value**. It is also important to **check that the book value** of the investment is **not included in this total**, either.

Cox Limited is worth R20 500, excluding the value of its investment in Dox Limited.

Dox Limited is worth R2 300, excluding the value of its investment in Cox Limited.

The **second and final step** involves **determining the total value** of a company, **including the value of its investment** in the other company. Before proceeding to this, however, just take a moment to reflect on the determination of a shareholding in a company.

DETERMINATION OF THE SHAREHOLDING IN A COMPANY

It is essential to understand that the interest of one company in another is determined based on **the NUMBER of shares HELD by one company, expressed as a percentage of the total NUMBER of shares ISSUED by the OTHER company.** The book value of the investment is irrelevant.

Cox holds 1 000 shares in Dox – refer to the assets side of the balance sheets at the bottom of page 99.

To determine the shareholding of Cox in Dox, one has to establish exactly how many shares Dox has issued in total. By referring to the equity and liabilities side of the balance sheet, also at the bottom of page 99, it can be seen that **DOX's** TOTAL share capital amounts to R5 000, consisting of shares with a par value of R1. The total number of shares Dox has in issue is therefore 5 000 shares, of which Cox owns 1 000. Cox's interest in Dox is therefore 1 000 divided by 5 000, simplified to one fifth.

Dox owns 500 shares in Cox, out of a total 16 000 issued by Cox (R16 000 ÷ R1). Its interest in Cox is therefore 500 out of 16 000, which could be simplified to a fraction of 1 over 32.

It is also **essential to determine the number of shares issued by taking the par value of shares into account**. If, for example, Dox has issued shares with a par value of R2 instead of R1, the total number of shares issued would be R5 000 ÷ R2, namely 2 500 shares. Cox's interest in Dox would in such a case be 1 000 out of 2 500, which would change its interest in Dox from 20% to 40%!

DETERMINATION OF THE TOTAL VALUE OF COX LIMITED AND DOX LIMITED

STEP 1: DETERMINE THE MONETARY VALUE OF EACH COMPANY EXCLUDING THE INVESTMENT IN THE OTHER COMPANY

The value of Cox amounts to R20 500, which excludes its investment in Dox. The value of Dox amounts to R2 300, which excludes its investment in Cox.

STEP 2: DETERMINE THE TOTAL VALUE OF EACH COMPANY

Let's use C to represent Cox and D to represent Dox. Once solved, C would represent the total value of Cox Limited and D the total value of Dox Limited.

The total value of C could be expressed in an equation as the monetary value of Cox, as discussed in step 1 above (that is, excluding the value of its investment in Dox), plus its shareholding in Dox, expressed as a decimal or fraction of D.

The equation would appear as follows:

$C = 20500 + 1/5D$……………………………….…… (equation 1)

The equation to express the total value of D, would similarly be presented as the monetary value of Dox, excluding the value of its investment in Cox, plus its shareholding in Cox, expressed as a decimal or fraction of C.

The equation would appear as follows:

$D = 2\ 300 + 1/32C$ …………….………….……….. (equation 2)

We could now reformulate the value of C (equation 1) by substituting the character D by the definition of D as it appears in equation 2, thus creating equation 3. This third equation has only one variable, the value of which will be determined by solving the equation.

Substituting the D character in equation 1 by its definition in equation 2:

$C = 20\ 500 + 1/5(2\ 300 + 1/32C)$ ……………..……… (equation 3)

You now have one equation with one unknown, which is easy to solve.

Bearing in mind that each term in brackets (terms are separated by + and – signs) needs to be multiplied by one fifth, equation 3 could be solved as follows:

$C = 20500 + (1/5 \times 2300) + (1/5 \times 1/32C)$

$C = 20500 + 460 + 1/160C$

Taking all C values to the left side of the equation, this time remembering that a plus sign changes to a negative sign and vice versa, the equation would appear as follows:

C – 1/160C   = 20500 + 460

Remembering that C actually is 1 C, or 160/160C, the equation would appear as follows:

160/160C – 1/160C = 20500 + 460

159/160C   = 20960

C   = 20960 ÷ 159 × 160

C   ≈ 21 092

This (total) value of C could now be substituted in equation 2 to determine the total value of Dox.

D = 2300 + 1/32C

D = 2300 + 1/32 of R21092

D = 2300 + 659 (rounded off)

D = 2959

The total value of Dox amounts to R2 959.

ONE COULD JUST AS WELL HAVE DETERMINED THE VALUE OF DOX FIRST AND THEN SUBSTITUTED ITS VALUE INTO EQUATION 1 TO DETERMINE THE VALUE OF COX. THE OUTCOMES WOULD NOT BE DIFFERENT. IN THIS PARTICULAR CASE THE VALUES COULD DIFFER DUE TO ROUNDING.

STATEMENT OF DISTRIBUTION BETWEEN THE SHAREHOLDERS OF COX LIMITED AND DOX LIMITED

Investments that companies have in each other can never be taken over since at least one company will cease to exist. Values of these investments will always need to be written off in the books of the company that issued the shares.

Cox Limited will write off the portion due to Dox: 1/32 of R21 092, namely R659.

Dox Limited will write off the portion due to Cox: 1/5 of R2 959, namely R592.

Remaining amounts will be payable to the shareholders of each company.