Appendix 1
Formulas of CFROI

Starting from the following formula

$$GI = GCFa_{n|CFROI} + \frac{SV}{(1 + CFROI)^n}$$

we can demonstrate how the following alternative formulation of the *CFROI* can be derived, if we assume in the calculation of economic depreciation a discount rate $k = CFROI = r$

$$CFROI = (Gross\ Cash\ Flow - Economic\ Depreciation)/Gross\ Investment$$

Stating that:

$$ED = economic\ depreciation = (GL - SV) \times s_{n|r}$$

where $s_{n|r} = [(1 + r)^n - 1]/r$ is the final value of an n-period annuity with interest rate r

multiplying each member of the above equation by $(1+r)^n$ and therefore subtracting from each member *GI*, we can rewrite the relationship as follows:

$$GI[(1 + r)^n - 1] = GCF \times s_{n|r} - ED \times s_{n|r}.$$

Being $[(1 + r)^n - 1] = r \times s_{n|r}$ and $a_{n|r} = s_{n|r} \times (1 + r)^n$, we can get

$r \times GI = GCF - ED$ therefore $r = (GCF - ED)/GI$ (quod erat demonstrandum)

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Appendix 2
Excess Investor Return in Terms of EVA

According to O'Byrne (1997), we can express the excess investor return in year 1 as follows: $MV_1 + FCF_1 - (1 + k)MV_0$.

Expressing FCF (free cash flow) and MV (market value) in terms of EVA, we can write:

$$MV_0 = cap_0 + EVA_0/k + ((1+k)/k)\sum_{i=1}^{\infty} x_0 \Delta EVA_i/(1+k)^i$$

$$FCF_i = NOPAT_1 - \Delta cap_1 = EVA_i + kcap_0 - \Delta cap_1$$

$$MV_1 = cap_1 + EVA_1/k + ((1+k)/k)\sum_{i=2}^{\infty} x_1 \Delta EVA_i/(1+k)^{i-1}$$

where $x_0\Delta EVA_i$ and $x_1\Delta EVA_i$ are the investors's expectations, at the end of year 0 and 1, of EVA improvement in year *i*.

Collecting similar terms and simplifying, we obtain the following relation of the excess return in year 1:

$$((1+k)/k)((EVA_1 - EVA_0) - x_0\Delta EVA_1) + ((1+k)/k)$$
$$\sum_{i=2}^{\infty}(x_1\Delta EVA_i - x_0\Delta EVA_i)/(1+k)^{i-1}$$

Generalizing, we can express the n year excess return as follows:

$$((1+k)/k)((EVA_n - EVA_{n-1}) - x_0\Delta EVA_n) + ((1+k)/k)$$
$$\sum_{i=n+1}^{\infty}(x_n\Delta EVA_i - x_0\Delta EVA_i)/(1+k)^{i-n}$$

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