

- 1) What is the return on beginning equity for fiscal 2007?
- 2) What is the 2007 beginning balance of net operating assets (i.e. the amount at the end of fiscal 2006)? Assume that cash and cash equivalents is an operating asset. Also, all notes payables resulted from operating activities.
- 3) What is the 2007 return on beginning net operating assets?
- 4) Using the Advanced Dupont Model, show why the return on beginning equity in #1 is so much higher than the return on beginning net operating assets in #3. To help, note that the net borrowing costs, based on the beginning value of net financial obligations, is $319(1-.287)/(3053+723) = .0602$.
- 5) In note 1 Kellogg states that the average days sales outstanding in accounts receivable is 19 days. Attempt to verify this claim using information from the income statement and balance sheet. Why might your answer differ significantly from 19 days?
- 6) Advertising expenses are all included in the line "selling, general and administration expense" on the main income statement (and amounts are given in note 15). Kellogg's management clearly thinks of this as an investment rather than an expense. What would the "advertising asset" be at the end of fiscal 2007 if Kellogg capitalized the expenditure and then amortized it over three years, beginning with the year the expenditure was made? Assume all advertising expenses were made in the beginning for the year and amortized equally over the three year period.
- 7) Kellogg lists an impressive number of brand names in the first section of their 10-K. How are these assets reflected in the financial statements? Limit your answer to two sentences.
- 8) Kellogg's management forecasts that sales will increase 5% next year and advertising expense with increase 15% next year. Assuming the ratio of all non-advertising components of SG&A to sales remains the same in 2008 as in 2007, what is the forecasted SG&A margin next year?
- 9) Using only the income statement and balance sheet, what was the net dividend to equityholders for fiscal 2007?
- 10) Suppose the cost of equity capital is 10% and all flows occur at the end of the fiscal year. Assume that net income and ending common equity grow at the rate of 5% perpetually starting in 2010 (to be clear, ending 2010 net income and common equity are 5% higher than the ending 2009 amounts). Using the residual income valuation model, and the forecasts given in the table below for 2008-2009, what is the estimated value of Kellogg at the end of fiscal 2007?

	Fiscal 2007	Projected 2008	Projected 2009	Projected 2010	Projected 2011
Net Income		1,200	1,300		
Ending Common Equity	2,526	3,526	4,526		
Projected Residual income					

Suggested Solution:

1) '07 Net earnings/'06 Total shareholder's equity = $1,103/2,069 = .533$

(Balance sheet figures are as of year end. Therefore, this year's ending balance becomes next year's beginning balance)

2) There are two ways to get at the 2007 beginning balance of net operating assets:

1) '06 Total shareholder's equity + '06 LT debt + '06 ST debt = $2,069 + 3,053 + 723 = 5,845$ million.

2) Operating assets minus operating liabilities = Total Assets - (Notes payable + A/P + other current liabilities + Other liabilities) = $10714 - (1268 + 910 + 1119 + 1572) = 5,845$ million.

3) '07 effective tax rate = '07 Income taxes / '07 Earnings before income taxes = $444/1,547 = 0.287$.

NOI = '07 Net earnings + (1 - tax rate) * '07 interest expenses = $1,103 + (1 - 0.287) * 319 = 1,330.45$

RNOA = NOI/NOA = $1,330.45/5,845 = 0.2276$,

4) ROE = RNOA + leverage * (RNOA - NBC), where leverage = NFO/CE

leverage = $(3,053 + 723)/2,069 = 1.82$

Therefore, Kellogg's ROE = $0.2276 + 1.825 * (0.2276 - 0.0602) = 0.533$

The ROE is higher than RNOA because a 16% spread is levered 1.825 times.

5) Average days sales outstanding in AR = (average AR/sales) * 365 = $[(1,026 + 945)/2]/11776 * 365 = 30.54$.

- The end-of-year balances of receivables might be significantly higher than the average daily balance, or if they use 250 business days in a year, would get about 21.
- Another alternative is that they are only referring to trade receivables, as shown in footnote 15, which gives $[(840 + 908)/2]/11776 = 27.1$ days (but the sales figure is overstated in this case).
- Finally, the 19 days refers only to North American sales, so maybe the international receivables take considerably longer to collect.

6) Remaining asset value of

'05 advertising expense : Fully amortized

'06 advertising expense : $1/3 * 916 = 305.3$

'07 advertising expense : $2/3 * 1,063 = 708.6$

Therefore, remaining advertising asset as of year 2007 = $0 + 305.3 + 708.6 = 1,014$

Note that the question asks about the value of the asset (i.e., the unamortized expense) and not the amortization expense. The 2005 expense was amortized in 05, 06 and 07 and therefore at the end of 07 the asset value is zero. For the 06 expense, 1/3 was amortized in 06 and 1/3 in 07; therefore the remaining asset is 1/3 of the expense. Similarly, 1/3 of the 07 expense is amortized in 07 and the remaining asset (or the unamortized expense) equals 2/3 of the original asset.

7) They generate revenue on the income statement but most of them are not shown on the balance sheet, as they are internally developed. Some of the brands were purchased, however, in the Keebler foods acquisition. These are on the balance sheet, either as intangibles or as goodwill.

8) '08 SG&A margin estimate = ('08 non-advertising SG&A + '08 advertising expense) / '08 sales

2008's sales estimate = $1.05 * 11,776 = 12,365$.

Non-advertising SG&A/sales in 2007 = $(3,311 - 1,063)/11776 = 0.1909$.

Putting these two together gives non-advertising SG&A of $12,365 * 0.1909 = 2360.49$ in 2008.

Next year's advertising = $1.15 * 1063 = 1222.45$

Therefore, SGA margin in 2008 is $(2360.49 + 1222.45)/12,365 = .2898$.

9) '07 Net earnings – change in BV = 1103 – (2526 – 2069) = 646.

10) In order to compute the value of Kellogg, we first need to compute the residual income ($RI_t = NI_t - r_e CE_{t-1}$) for 2008-2011 (numbers highlighted in yellow are calculated):

	Actual 2007 (t=0)	Projected 2008 (t=1)	Projected 2009 (t=2)	Projected 2010 (T=3)	Projected 2011
Net Income (NI)		1,200	1,300	1,300*1.05=1,365	1,365*1.05=1,433.25
Ending Common Equity	2,526	3,526	4,526	4,526*1.05=4,752.3	4,752.3*1.05=4,989.92
Projected Residual income (RI)		$RI_t = NI_t - r_e CE_{t-1}$ 947.4=1,200-10%*2,526	$RI_t = NI_t - r_e CE_{t-1}$ 947.4=1,300-10%*3,526	$RI_t = NI_t - r_e CE_{t-1}$ 912.4=1,365-10%*4,526	$RI_t = NI_t - r_e CE_{t-1}$ 958.02=1,433.25-10%*4,752.3
Growth in Projected Res. Inc.			0%	-3.69%	5%

Next, we plug in the forecasted residual income in the residual income valuation model:

$$P_e = CE_0 + \sum_{t=1}^{T-1} (1+r_e)^{-t} RI_t + \frac{RI_T}{(r_e - g)(1+r_e)^{T-1}}$$

Where,

- RI_t – Residual Income in period t
- r_e – the discount rate, which is given as 10%
- g – this is the perpetual growth rate, which is given as 5% in the problem
- CE_0 – the value of common equity at the end of period $t = 0$ (i.e. the last year of actual results, which is 2007, or $CE_0 = \$2,526$).
- RI_T – is the numerator in the terminal value term. It is equal to the projected residual income for year T . The book defines this term on pg. 244 as: “starting in year T , the financial statement forecasts imply that residual income will be RI_T and then grow at rate g forever after”. So, year T is the year before perpetual growth in residual income starts. In this question, 2011 is the first year in which residual income starts to grow at 5%; hence, period T will be 2010 (as you can see in the table above, residual income starts to grow perpetually at a rate of 5% beginning in 2011).

Putting this all together, we can plug everything into the Residual Income formula above:

$$P_e = CE_{2007} + PV \text{ of } 2008 \text{ RI} + PV \text{ of } 2009 \text{ RI} + \text{Terminal value of } 2010 \text{ RI}$$

$$P_e = 2,526 + \frac{947.4}{(1+0.10)^1} + \frac{947.4}{(1+0.10)^2} + \frac{912.4}{(0.10-0.05)(1+0.10)^2} = 2,526 + 861.27 + 782.975 + 15,080.99$$

$$= 19,251.24 \text{ million}$$

To summarize, the key in this question is to correctly compute residual income and realizing that period T (the terminal period) starts in 2010, which is the last year before residual income starts to grow at a rate of 5% in perpetuity.

As a different example, suppose we change the wording of question 10 and instead of assuming that net income and ending common equity grow at the rate of 5% perpetually starting in 2010, we now assume that

residual income grows at the rate of 5% perpetually starting in 2010. In other words, suppose question 10 read like this:

“Suppose the cost of equity capital is 10% and all flows occur at the end of the fiscal year. Assume that *residual income* grows at the rate of 5% perpetually starting in 2010 (to be clear, 2010 amounts are 5% higher than 2009 amounts). Using the residual income model, and the forecasts given in the table below, what is the estimated value of Kellogg at the end of fiscal 2007?”

	Fiscal 2007	Projected 2008	Projected 2009	Projected 2010	Projected 2011
Net Income		1,200	1,300		
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Projected Residual income					

Solution: In this case, the question states explicitly that residual income begins to grow perpetually at 5% beginning in 2010, which means that 2009 becomes year T (since it is now the year immediately before residual income begins to grow perpetually). So the answer would be –

	Fiscal 2007 ($t=0$)	Projected 2008 ($t=1$)	Projected 2009 ($T=2$)	Projected 2010
Net Income		1,200	1,300	
Ending Common Equity	2,526	3,526	4,526	
Projected Residual income		$RI_t = NI_t - r_e CE_{t-1}$ 947.4=1,200-10*2,526	$RI_t = NI_t - r_e CE_{t-1}$ 947.4=1,300-10*3,526	994.77=947.4*1.05
Growth in Projected Res. Inc.			0%	5%

$$P_e = 2,526 + \frac{947.4}{(1 + 0.10)^1} + \frac{947.4}{(0.10 - 0.05)(1 + 0.10)^1} = 2,526 + 861.27 + 17,225.45 = 20,612.73 \text{ million}$$