

Regnskabsanalyse og Aktievurdering

Simpel værdiansættelse
og budgettering

Kapitel 15

Hvad vil du lære fra kapitlet?

Hvorledes et simpelt forecast kan foretages ud fra regnskabet

Hvorledes et simpelt forecast leder til en simpel værdiansættelse

Hvornår simple forecast og værdiansættelser virker som rimelige estimater

Hvorledes et simpelt forecast kan anvendes som værktøj i følsomhedsanalysen

Hvad vil du lære fra kapitlet? - fortsat

Hvorledes en simpel værdiansættelsesmodel virker ved "reverse engineering"

Hvorledes man foretager følsomhedsanalyser

Den perfekte balance

MS, Inc.
Balance Sheet, December 31, Year 0

<u>Assets</u>			<u>Equities</u>		
	<u>Year 0</u>	<u>Prior Year</u>		<u>Year 0</u>	<u>Prior Year</u>
Marketable equity securities (at market)	23.4	20.3	Long-term debt (NFO)	7.7	7.0
	_____	_____	Common shareholders' equity (CSE)	<u>15.7</u>	<u>13.3</u>
NOA	<u>23.4</u>	<u>20.3</u>		<u>23.4</u>	<u>20.3</u>

Med en perfekt balance er de forventede residualoverskud nul

Simpelt forecast: Budggetering fra bogførte værdier (SF1)

Operating	$OI_1 = (\rho_F - 1) NOA_0$	$OI_1 - (\rho_F - 1) NOA_0 = 0$
Financing	$NFE_1 = (\rho_D - 1) NFO_0$	$NFE_1 - (\rho_D - 1) NFO_0 = 0$
Earnings	$Earn_1 = (\rho_E - 1) CSE_0$	$Earn_1 - (\rho_E - 1) CSE_0 = 0$

MS Inc.

Pro Forma Income Statement, Year 1

Residual Earnings

Operating income:	0.1134×23.4	2.654	0
Interest expense:	0.10×7.7	<u>(.770)</u>	<u>0</u>
Earnings:	0.12×15.7	<u>1.884</u>	<u>0</u>

Afkastkravet for driften vægtes af ρ_E (12%) og ρ_D (10%) fra deres respektive værdier fra dagsværdibalancen

$$\text{Afkastkrav for driften} = \left[\frac{15.7}{23.4} \times 12.0\% \right] + \left[\frac{7.7}{23.4} \times 10.\% \right] = 11.34\%$$

SF1 Værdiansættelse

For MS Inc.

$$V_E^0 = CSE_0$$

$$V_E^0 = 15.7$$

$$V_0^{NOA} = NOA_0$$

$$V_0^{NOA} = 23.4$$

(Normal P/B ratio)

Den Imperfekte balance

PPE, Inc.
Balance Sheet, December 31 Year 0

<u>Assets</u>			<u>Equities</u>		
	<u>Year 0</u>	<u>Prior Year</u>		<u>Year 0</u>	<u>Prior Year</u>
Property, plant & equipment (at cost less accum deprec)	74.4	69.9	Long-term debt (NFO)	7.7	7.0
			Common shareholders' equity (CSE)	<u>66.7</u>	<u>62.9</u>
NOA	<u>74.4</u>	<u>69.9</u>		<u>74.4</u>	<u>69.9</u>

Afkastkrav for driften = 11.34%

Resultatopgørelsen

Income Statement Year 0

Operating Income:	
Sales of Products	124.9
Cost of goods sold (including depreciation of 21.4)	<u>(114.6)</u>
	10.3
Other operating expenses	<u>(0.5)</u>
	9.8
Net Financial Expense:	
0.10 x 7.0	<u>(0.7)</u>
Earnings:	<u><u>9.1</u></u>

Pengestrømsopgørelsen

PPE Inc.

Statement of Cash Flows, Year 0

Cash flow from operations:	
Operating income	9.8
Depreciation	<u>21.4</u>
	31.2
Cash flow in investing activities:	
Investment in PPE (21.4 + 4.5)	<u>(25.9)</u>
Free cash flow	<u>5.3</u>
Cash flow in financing activities:	
Net dividends paid	<u>5.3</u>

Simpelt Forecasts: Forecasting fra overskud og bogførte værdier (SF2)

Earnings Component	Forecast of Earnings Component	Forecast of Residual Earnings for the Component	Forecast of Abnormal Earnings Growth
Operating	$OI_1 = OI_0 + (\rho_F - 1)\Delta NOA_0$	$ReOI_1 = ReOI_0$	AOIG = 0
Earnings	$Earn_1 = Earn_0 + (\rho_E - 1) \Delta CSE_0$	$RE_1 = RE_0$	AEG = 0

PPE, Inc.

Pro Forma Income Statement, Year 1

Operating income:	9.8 + (.1134 x 4.5)	10.310
Interest expense:	0.7 + (.10 x 0.7)	<u>(.770)</u>
Net income:	9.1 + (? x 3,8)	<u>9.540</u>

SF2 Valuation

$$V_0^E = CSE_0 + \frac{\text{Re}OI_0}{\rho_F - 1}$$

$$V_0^{NOA} = NOA_0 + \frac{\bar{O}\bar{I}_1 - (\rho_F - 1)NOA_0}{\rho_F - 1}$$

SF2 ReOI Valuation

$$V_0^E = CSE_0 + \frac{\text{ReOI}_0}{\rho_F - 1}$$

$$V_0^{\text{NOA}} = \text{NOA}_0 + \frac{\bar{O}\bar{I}_1 - (\rho_F - 1)\text{NOA}_0}{\rho_F - 1}$$

For PPE Inc.

$$V_0^{\text{NOA}} = 74.4 + \frac{1.873}{0.1134} = 90.91$$

SF2 AOIG Valuation

$$V_0^{\text{NOA}} = \frac{OI_1}{\rho_F - 1}$$

Konstant ReOI implicerer AOIG = 0

AOIG = 0 implicerer en normal enterprise P/E ratio

For PPE Inc.

$$V_0^{\text{NOA}} = \frac{10.310}{0.1134}$$

$$= 90.92$$

$$\frac{V_0^{\text{NOA}}}{OI_1} = \frac{90.92}{10.310} = 8.82 = \frac{1}{0.1134}$$

Simple Forecasts: Forecasting fra nuværende regnskabsmæssige afkast (SF3)

Earnings Component	Forecast of Earnings Component	Forecast of Residual Earnings
Operating Earnings	$OI_1 = RNOA_0 \times NOA_0$ $Earn_1 = ROCE_0 \times CSE_0$	$[RNOA_1 - (\rho_F - 1)] NOA_0 = [RNOA_0 - (\rho_F - 1)] NOA_0$ $[ROCE_1 - (\rho_E - 1)] CSE_0 = [ROCE_0 - (\rho_E - 1)] CSE_0$

For PPE, Inc. the current RNOA, NBC and ROCE (with beginning of year amounts in the denominator) are 14.02%, 10.00% and 14.47% respectively

PPE, Inc.

Pro Forma Income Statement, Year 1

Operating income:	.1402 x 74.4	10.431
Interest expense:	.10 x 7.7	<u>.770</u>
Earnings:		<u>9.661</u>

Værdiansættelse (med konstant RNOA)

$$\text{Growth Rate in } \overline{\text{ReOI}}_1 = \frac{[\overline{\text{RNOA}}_1 - (\rho_F - 1)] \text{NOA}_0}{[\overline{\text{RNOA}}_0 - (\rho_F - 1)] \text{NOA}_{-1}}$$

If $\overline{\text{RNOA}}_1 = \overline{\text{RNOA}}_0$

$$\text{Growth Rate in } \overline{\text{ReOI}}_1 = \frac{\text{NOA}_0}{\text{NOA}_{-1}}$$

If $\overline{\text{RNOA}}$ is constant for all periods,

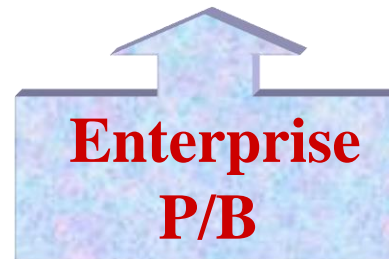
$$V_0^E = CSE_0 + \frac{[\overline{\text{RNOA}}_0 - (\rho_F - 1)] \text{NOA}_0}{\rho_F - g}$$

$$V_0^{\text{NOA}} = \text{NOA}_0 + \frac{[\overline{\text{RNOA}}_0 - (\rho_F - 1)] \text{NOA}_0}{\rho_F - g}$$

(g er vækstraten i NOA; $\overline{\text{RNOA}}_0$ er Core $\overline{\text{RNOA}}_0$)

SFE Værdiansættelse - fortsat

$$V_0^{\text{NOA}} = \text{NOA}_0 \times \frac{\text{RNOA}_0 - (g - 1)}{\rho_F - g}$$



For PPE Inc., $g = 1.0644$ (6.44% growth)

$$V_0^{\text{NOA}} = 74.4 \times \frac{0.1402 - 0.0644}{1.1134 - 1.0644} = 115.09$$



SF3 AOIG Valuation

$$\begin{aligned} \text{AOIG} &= \Delta \text{ReOI} \\ \text{AOIG}_2 &= \text{ReOI}_1 \times (g - 1) \end{aligned} \quad V_0^{\text{NOA}} = \text{OI}_1 \times \frac{1}{\rho_F - 1} \left[1 + \frac{\text{AOIG}_2 / \text{OI}_1}{\rho_F - g} \right]$$

For PPE Inc.:

$$\text{ReOI}_1 = 1.994$$

$$\text{AOIG}_2 = 1.994 \times 0.0644 = 0.128$$

**Forward
Enterprise P/E**

$$V_0^{\text{NOA}} = 10.341 \times \frac{1}{0.1134} \left[1 + \frac{0.128 / 10.431}{1.1134 - 1.0644} \right] = 115.09$$

**Forward
Enterprise P/E**

$$= 11.03$$

The SF3 AOIG Valuation Restated

$$V_0^{\text{NOA}} = \text{OI}_1 \times \frac{1}{\rho_F - 1} \left[1 + \frac{G_2 - \rho_F}{\rho_F - g} \right]$$

**Forward
Enterprise P/E**

G_2 = Cum-dividend growth rate, two years ahead

For PPE Inc. $G_2 = 11.743/10.431 = 1.1257$

$$V_0^{\text{NOA}} = 10.431 \times \frac{1}{0.1134} \left[1 + \frac{1.1257 - 1.1134}{1.1134 - 1.0644} \right] = 115.09$$

**Forward
Enterprise P/E**

= 11.03

Simple Forecasts and Simple Valuations

Simple Forecast	Simple Valuation of the Equity	Simple Valuation of the Operations
SF1	$V_0^E = CSE_0$	$V_0^{NOA} = NOA_0$
SF2	$V_0^E = CSE_0 + \frac{ReOI_0}{\rho_F - 1}$	$V_0^{NOA} = NOA_0 + \frac{ReOI_0}{\rho_F - 1} = \frac{\overline{OI}_1}{\rho_F - 1}$
SF3	$V_0^E = CSE_0 + \frac{[RNOA_0 - (\rho_F - 1)]NOA_0}{\rho_F - g}$	$V_0^{NOA} = NOA_0 + \frac{[RNOA_0 - (\rho_F - 1)]NOA_0}{\rho_F - g}$ $= NOA_0 \times \frac{RNOA_0 - [g - 1]}{\rho_F - g}$ $V_0^{NOA} = OI_1 + \frac{1}{\rho_F - 1} \left[1 + \frac{AOIG_2 / OI_1}{\rho_F - g} \right]$ $= OI_1 \times \frac{1}{\rho_F - 1} \left[1 + \frac{G_2 - \rho_F}{\rho_F - g} \right]$

Simple Forecasts af vækst i NOA

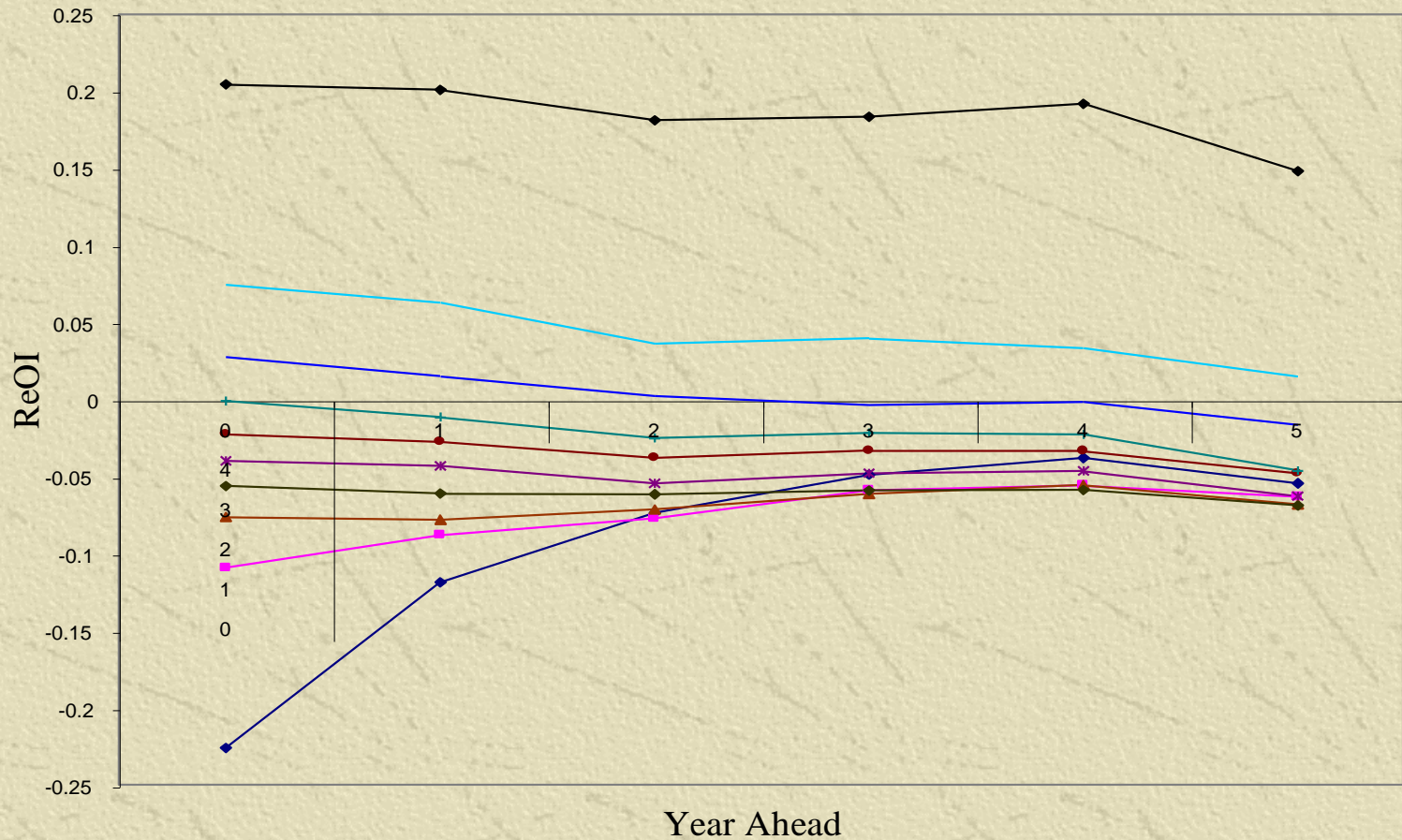
$$\text{NOA} = \text{Salg} \times \frac{1}{\text{ATO}}$$

Hvis ATO er konstant,

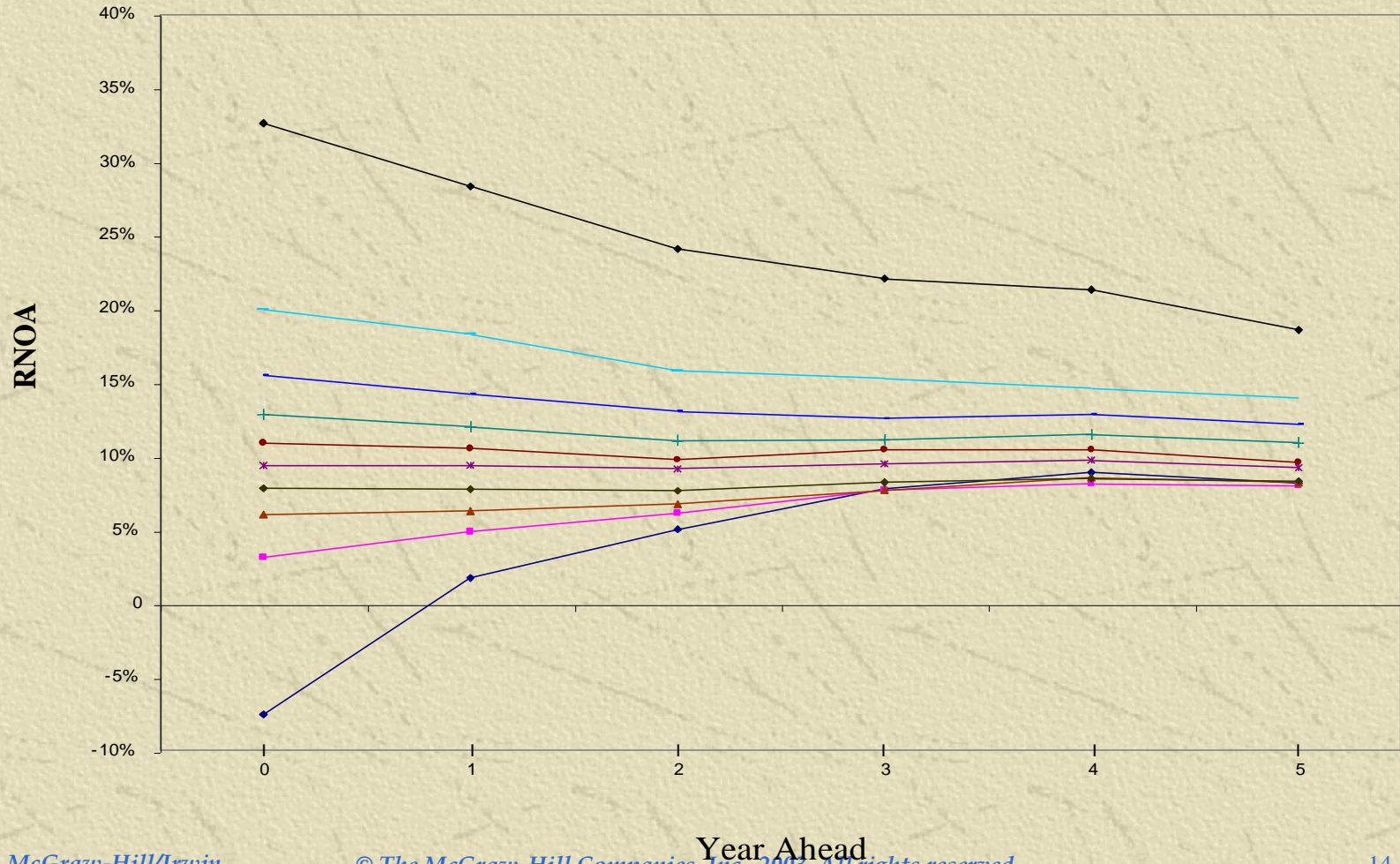
$$\text{Vækst i NOA} = \text{Vækst i salget} \times \frac{1}{\text{ATO}}$$

Forecast vækst i NOA med forecasted vækst i salget

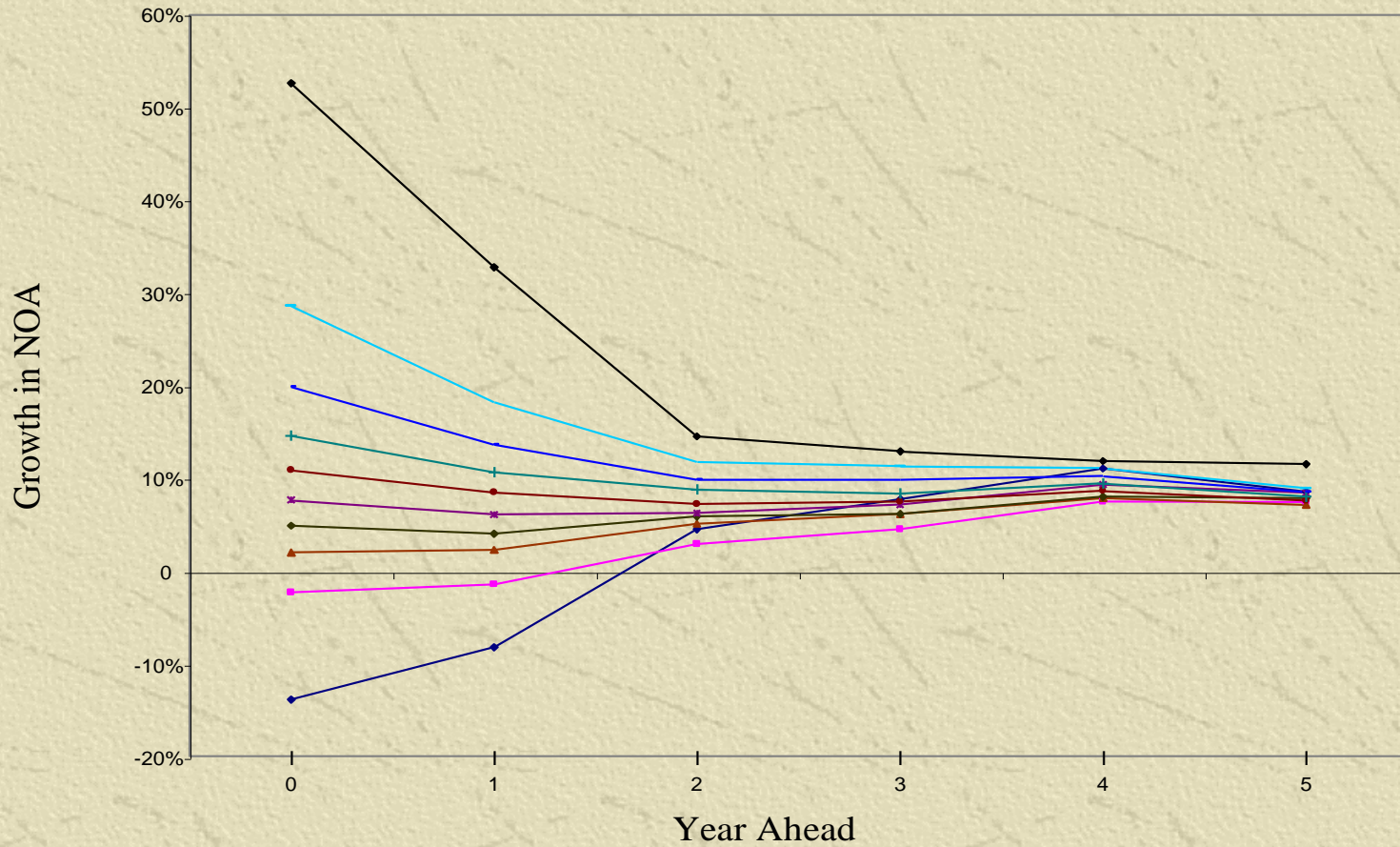
Residual Operating Income Patterns: 1965 - 1996



RNOA Patterns, 1965 - 1996



Growth in NOA Patterns, 1965 – 1996



Simpel værdiansættelse med kort- og lang-sigtet vækstrater

G_2 = to-årig frem tiden cum-dividend vækstrate

G_{long} = lang-sigtet vækstrate

$$V_0^{NOA} = OI_1 \times \frac{1}{\rho_F - 1} \left[\frac{G_2 - G_{long}}{\rho_F - G_{long}} \right]$$



Two-Stage Growth Valuation for Nike

	1996	1997	1998
Operating income		654	732
Net operating assets	2,659	2,932	
Free cash flow (OI - Δ NOA)		381	
Reinvested free cash flow (at 11%)			42
Cum-dividend operating income			774
Cum-dividend operating income growth rate: 774/654			18.35%

For the valuation: $G_2 = 1.1835$

$$G_{\text{long}} = 1.04$$

$$\rho_F = 1.11$$

$$V_{1996}^{\text{NOA}} = 654 \times \frac{1}{0.11} \left[\frac{1.1835 - 1.04}{1.11 - 1.04} \right] = \$12,188 \text{ million}$$

$$V_{1996}^{\text{E}} = V_{1996}^{\text{NOA}} - \text{NFO} = 12,188 - 228 = \$11,960 \text{ million}$$

Value per share on 143.629 shares is \$83.27

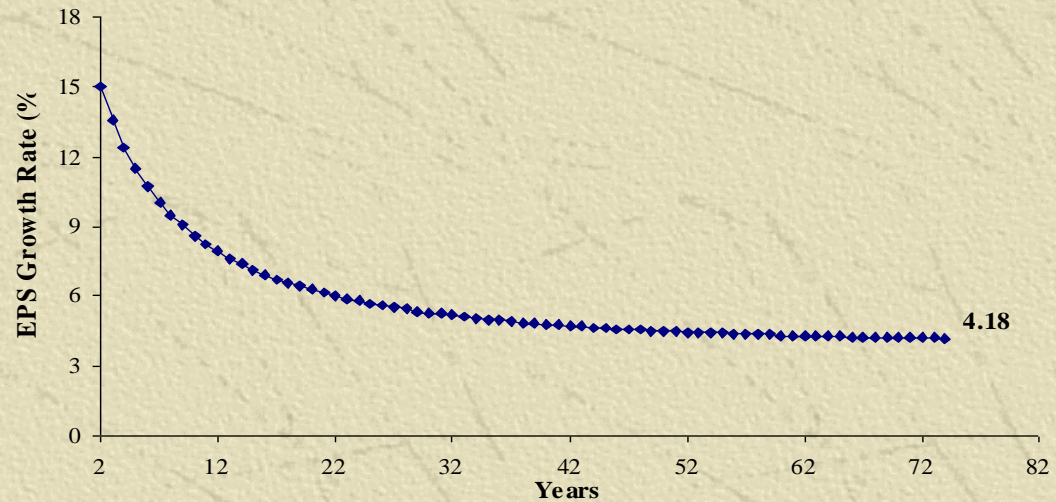
Understanding the Long-term Growth Rate

The long-term rate specifies the rate of decay from G_2

$G_2 = 15.0\%$
 $G_3 = 13.6\%$
 $G_4 = 12.4\%$
 $G_5 = 11.5\%$



$g_{\text{long}} = 4.0\%$



The Valuation Grid: Nike

What values are implied by different combinations of RNOA and growth in NOA?

Valuation Grid for Nike, Inc., 1996 Required return for operations: 11%				
RNOA \ Growth In NOA	15%	20%	23.3%	25%
0%	23.66	32.07	37.63	40.49
4%	27.50	40.73	49.46	53.95
7%	35.44	58.58	73.85	81.72
8.39%	45.30	80.76	104.00	116.23
9%	53.95	110.23	130.78	146.52

Simpel forecasting som et analytisk værktøj: Følsomhedsanalyse

“As If” Spørgsmål

- Effekt af ændringer i RNOA
- Effekt af ændringer i PM og ATO
- Effekt af ændringer i investeringer (vækst i NOA)
- Effekt af leverage på forecast af NI