Value Enhancement Strategies

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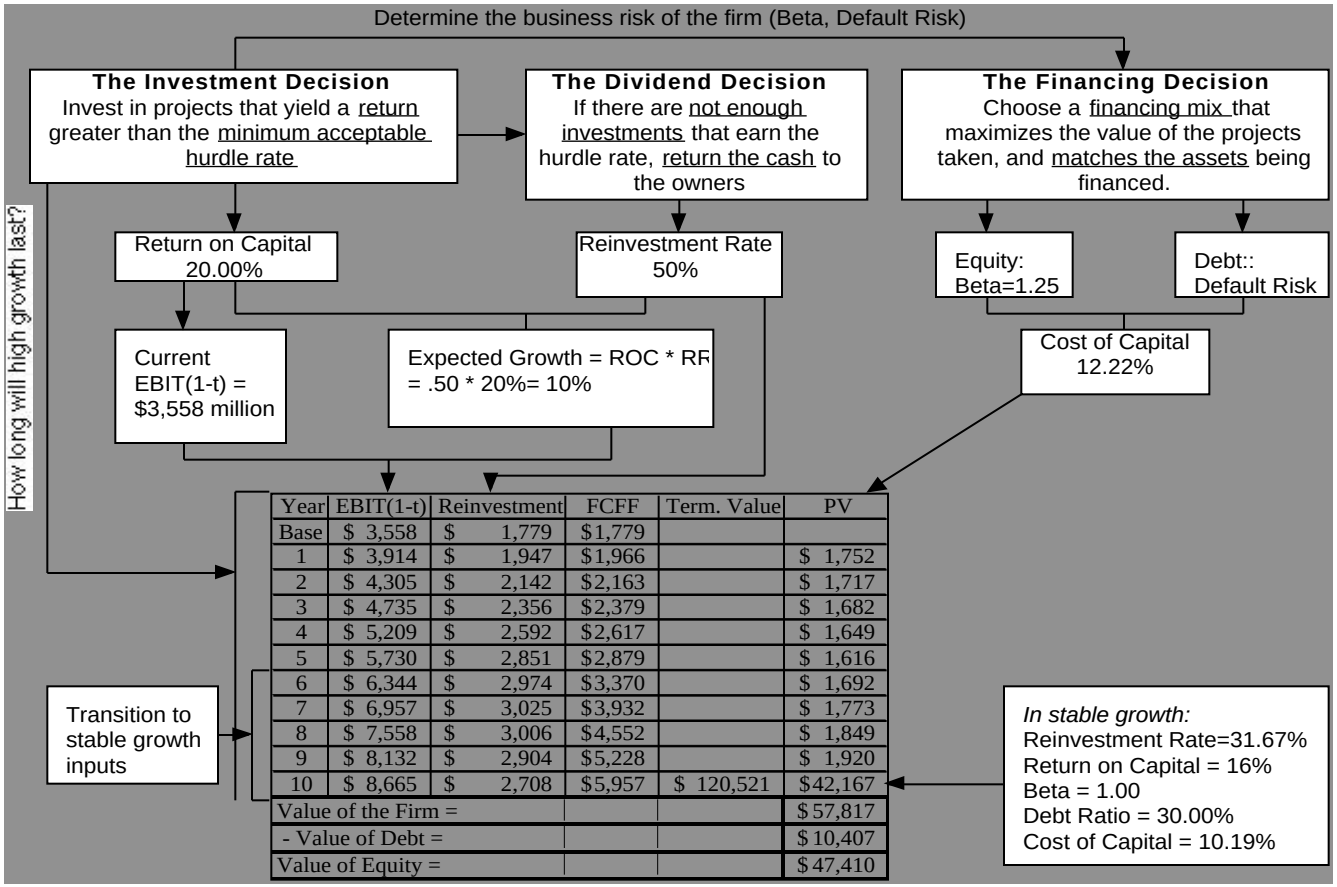
The Objective Function In Corporate Finance

- The objective in decision making is to maximize firm value.
- In practice, conventional corporate financial theory argues that there are three ways of creating value:
  - Make **better investment decisions**. The net present value of the projects that you take on increases your value as a firm.
  - Use the **right financing mix** for your firm, which translates into a lower cost of capital
  - Establish an **optimal reinvestment policy**, which implies reinvenvesting as long as projects earn a return greater than the cost of capital

How Corporate Financial Decisions show up In Classical DCF valuation



Year	EBIT(1-t)	Reinvestment	FCFF	Term. Value	PV
Base	$ 3,558	$ 1,779	$1,779		
1	$ 3,914	$ 1,947	$1,966		$ 1,752
2	$ 4,305	$ 2,142	$2,163		$ 1,717
3	$ 4,735	$ 2,356	$2,379		$ 1,682
4	$ 5,209	$ 2,592	$2,617		$ 1,649
5	$ 5,730	$ 2,851	$2,879		$ 1,616
6	$ 6,344	$ 2,974	$3,370		$ 1,692
7	$ 6,957	$ 3,025	$3,932		$ 1,773
8	$ 7,558	$ 3,006	$4,552		$ 1,849
9	$ 8,132	$ 2,904	$5,228		$ 1,920
10	$ 8,665	$ 2,708	$5,957	$ 120,521	$42,167
Value of the Firm =					$ 57,817
- Value of Debt =					$ 10,407
Value of Equity =					$ 47,410

Alternative Approaches to Value Enhancement

- *Maximize a variable that is correlated with the value of the firm. There are several choices for such a variable. It could be*
  - an accounting variable, such as **earnings or return on investment**
  - a marketing variable, such as **market share**
  - a cash flow variable, such as cash flow return on investment (CFROI)
  - a risk-adjusted cash flow variable, such as Economic Value Added (EVA)
- **The advantages of using these variables are that they**
  - Are often simpler and easier to use than DCF value.
- **The disadvantage is that the**
  - Simplicity comes at a cost; these variables are not perfectly correlated with DCF value.

Economic Value Added (EVA) and CFROI

- The Economic Value Added (EVA) is a measure of surplus value created on an investment.
  - Define the return on capital (ROC) to be the "true" cash flow return on capital earned on an investment.
  - Define the cost of capital as the weighted average of the costs of the different financing instruments used to finance the investment.

EVA = (Return on Capital - Cost of Capital) (Capital Invested in Project)

- The CFROI is a measure of the cash flow return made on capital

CFROI = (Adjusted EBIT (1-t) + Depreciation & Other Non-cash Charges) / Capital Invested

In Practice: Measuring Capital Invested

- Many firms use the book value of capital invested as their measure of capital invested. To the degree that book value reflects accounting choices made over time, this may not be true.
- In cases where firms alter their capital invested through their operating decisions (for example, by using operating leases), the capital and the after-tax operating income have to be adjusted to reflect true capital invested.

In Practice: Measuring Return on Capital

- Again, the accounting definition of return on capital may not reflect the economic return on capital.
- In particular, the operating income has to be cleansed of any expenses which are really capital expenses (in the sense that they create future value). One example would be R& D.
- The operating income also has to be cleansed of any cosmetic or temporary effects.

In Practice: Measuring Cost of Capital

- DCF valuation assumes that cost of capital is calculated using market values of debt and equity.
- If it assumed that both assets in place and future growth are financed using the market value mix, the EVA should also be calculated using the market value.
- If instead, the entire debt is assumed to be carried by assets in place, the book value debt ratio will be used to calculate cost of capital. Implicit then is the assumption that as the firm grows, its debt ratio will approach its book value debt ratio.

Estimating Nestle's EVA in 1995: Return on Capital

- Return on Capital
  - After-tax Operating Income = 5665 Million Sfr (1 - .3351)
    = 3767 Million Sfr
  - Capital in Assets in Place1994 = BV of Equity + BV of Debt
    = 17774+(4180+7546) = 29,500 Million Sf
  - Return on Capital = 3767 / 29,500 = 12.77%

Nestle's Cost of Capital

- Cost of Equity = 4.5% + 0.99 (5.5%) = 10%
- Cost of Debt = 4.75% (1-.3351) = 3.16%
- Market Value of Equity = 56650 Million
- Value of Debt = 4180 +7546 = 11,726 Million Sfr

Cost of Capital = 10% (56650/68376)+3.16%(11726/68376) = 8.85%

Estimating EVA for Nestle

- Capital Invested = 29500 Million Sfr
- Return on Capital = 12.77%
- Cost of Capital = 8.85%
- Economic Value Added in 1995 = (.1277 - .0885) (29,500 Million Sfr) = 1154.50 Million Sfr

Discussion Issue

- Assume now that the Book Value at Nestle had been understated at 14,750 Million. Assuming the Operating Income remains the same, estimate the EVA.

EVA for Nestle in U.S. Dollar Terms

- Capital Invested = $ 19,963 Million (29,500 Million Sfr converted at $ 0.6767/franc)
- Return on Capital = 12.77%
- Cost of Capital = 11.21% (Effect of higher inflation and long bond rate)
- Economic Value Added in 1995 = (.1277 - .1121) ($ 19,963 Million) = $ 311 Million
- In Swiss Franc Terms, this works out to approximately Sfr 467 Million

EVA for Growth Companies

- For companies, divisions or projects which make significant infrastructure investments, with long gestation periods, the current EVA may not be a good indicator of the quality of investments.

Estimating Tsingtao's EVA in 1996

- Tsingtao Brewery, a Chinese Beer manufacturer, has make significant capital investments in the last two years, and plans to increase its exports over time. Using 1996 numbers, Tsingtao had the following fundamentals:
  - Return on Capital = 1.28%
  - Cost of Capital = 15.51%
  - Capital Invested = 3,015 million CC
- Economic Value Added in 1996 = – 429 million CC

Discussion Issue: Reading the EVA

- Tsingtao had a negative EVA of – 429 million in 1996. Assuming that the book value of capital, operating income and cost of capital are correctly measured, which of the following are implied by this EVA?
  - The firm has invested in poor projects
  - The firm has inferior management
  - The firm is currently earning less on its projects than it should be earning, given its cost of capital.
- What does this tell you about the current EVA of high growth firms and projects which make large investments up front on the expectations of high growth later on?
  - The measured EVA will generally be very positive
  - The measured EVA will generally be very negative

Things to Note about EVA

- EVA is a measure of dollar surplus value, not the percentage difference in returns.
- It is closest in both theory and construct to the net present value of a project in capital budgeting, as opposed to the IRR.
- The value of a firm, in DCF terms, can be written in terms of the EVA of projects in place and the present value of the EVA of future projects.

An Equity EVA

- When capital is difficult to measure, and leverage is not a choice variable (because of regulations or standard practice), the economic value added can be stated in equity terms
- Equity EVA = (ROE - Cost of Equity) (Equity Invested)
  - Equity Invested : This is supposed to measure the equity invested in projects in place. It is usually measured using the book value of equity, with adjustments made.
  - Return on Equity: This is supposed to measure the return made on the equity invested in projects in place. It is usually measured by dividing the net income by the book value of equity
  - Cost of Equity: This is supposed to measure the cost of equity for the project, division or firm, for which the EVA is being measured.

J.P. Morgan's Equity EVA: 1996

- Equity Invested at the end of 1995 = $ 10,451 Million
- Net Income Earned in 1996 = $ 1,574 Million
- Cost of Equity for 1996 = 7% + 0.94 (5.5%) = 12.17%
  - I used the riskfree rate from the start of 1996
- Equity EVA for J.P. Morgan = $ 1574 Million - ($10,451 Million)(.1217) = $ 303 Million

Increasing Equity EVA at J.P. Morgan

- Assume now that you are the CEO of J.P. Morgan and that your compensation next year will depend upon whether you increase the EVA or not. What are the three ways in which you can increase your EVA?

Divisional EVA

- When EVA is computed at the division level, the computation requires that
  - book value be estimated at the divisional level. Since firms do not maintain balance sheets at divisional levels, this will involve allocation mechanisms
  - income be estimated at the divisional level. Again, allocation of fixed headquarters expenses becomes an issue
  - cost of equity and capital be estimated at the divisional level
- The initial estimates of EVA are likely to reflect the allocation mechanisms used and the mistakes made in those allocations
- Changes in EVA over time are more useful measures than the initial EVA estimates themselves

Things to Note about EVA

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- The value of a firm, in DCF terms, can be written in terms of the EVA of projects in place and the present value of the EVA of future projects.

DCF Value and NPV

Value of Firm

= Value of Assets in Place + Value of Future Growth

= (Investment in Existing Assets + $NPV_{\text{Assets in Place}}$) + NPV of all future projects

$$= \left(I + NPV_{\text{Assets in Place}} \right) + \sum_{j=1}^{j=N} NPV_j$$

where there are expected to be N projects yielding surplus value (or excess returns) in the future and I is the capital invested in assets in place (which might or might not be equal to the book value of these assets).

The Basics of NPV

$$NPV_j = \sum_{t=1}^{t=n} \frac{(EBIT_t(1-t) + Depr_t)}{(1+WACC)^t} - \text{Initial Investment} \quad : \textit{Life of the project is n years}$$

$$\text{Initial Investment} = \sum_{t=1}^{t=n} \frac{WACC\ (\text{Initial Investment})}{(1+WACC)^t} + \frac{\text{Initial Investment}}{(1+WACC)^n} \quad : \textit{Alternative Investment}$$

$$NPV_j = \sum_{t=1}^{t=n} \frac{(EBIT_t(1-t) + Depr_t)}{(1+WACC)^t} - \sum_{t=1}^{t=n} \frac{WACC\ (\text{Initial Investment})}{(1+WACC)^t} - \frac{\text{Initial Investment}}{(1+WACC)^n}$$

$$= \sum_{t=1}^{t=n} \frac{EBIT_t(1-t)}{(1+WACC)^t} - \sum_{t=1}^{t=n} \frac{WACC\ (\text{Initial Investment})}{(1+WACC)^t} - \frac{\text{Initial Investment}}{(1+WACC)^n} + \sum_{t=1}^{t=n} \frac{Depr_t}{(1+WACC)^t}$$

An Aside on CFROI and NPV

- By focusing on percentage differences in returns, it may lead firms to turn away good projects which earn surplus returns.
- It does not adjust for risk and required returns (It ignores the cost of capital)
- It fails to factor in the initial investment. An investment that earns a CFROI which exceeds its cost of capital may not necessarily be a good investment.

$$\mathbf{NPV_j} = \sum_{t=1}^{t=n} \frac{(\text{CFROI} - \text{WACC})}{(1+\text{WACC})^t} (\text{Initial Investment}) - \frac{\text{Initial Investment}}{(1+\text{WACC})^n}$$

NPV to EVA

- **Define** ROC = EBIT (1-t) / Initial Investment: *The earnings before interest and taxes are assumed to measure true earnings on the project and should not be contaminated by capital charges (such as leases) or expenditures whose benefits accrue to future projects (such as R & D).*
- **Assume that** $\frac{\text{Initial Investment}}{(1+\text{WACC})^n} = \sum_{t=1}^{t=n} \frac{\text{Depr}_t}{(1+\text{WACC})^t}$: *The present value of depreciation covers the present value of capital invested, i.e, it is a return of capital.*

$$NPV_j = \sum_{t=1}^{t=n} \frac{\text{ROC (Initial Investment)}}{(1+\text{WACC})^t} - \sum_{t=1}^{t=n} \frac{\text{WACC (Initial Investment)}}{(1+\text{WACC})^t}$$

$$NPV_j = \sum_{t=1}^{t=n} \frac{(\text{ROC - WACC}) \text{ (Initial Investment)}}{(1+\text{WACC})^t} = \sum_{t=1}^{t=n} \frac{EVA_t}{(1+\text{WACC})^t}$$

DCF Valuation, NPV and EVA

$$\text{Value of Firm} = (I + NPV_{\text{Assets in Place}}) + \sum_{j=1}^{j=N} NPV_j$$

$$= \left(I_A + \sum_{t=1}^{t=n} \frac{(ROC - WACC)\, I_A}{(1+WACC)^t}\right) + \sum_{j=1}^{j=N} \left(\sum_{t=1}^{t=n} \frac{(ROC - WACC)\, I_j}{(1+WACC)^t}\right)$$

$$= \left(I_A + \sum_{t=1}^{t=n} \frac{(ROC - WACC)\, I_A}{(1+WACC)^t}\right) + \sum_{j=1}^{j=N} \left(\sum_{t=j1}^{t=jn} \frac{(ROC - WACC)\, I_j}{(1+WACC)^t}\right)$$

$$= \left(I_A + \sum_{t=1}^{t=n} \frac{EVA_A}{(1+WACC)^t}\right) + \sum_{j=1}^{j=N} \left(\sum_{t=j1}^{t=jn} \frac{EVA_j}{(1+WACC)^t}\right)$$

Firm Value = Capital Invested in Assets in Place + PV of EVA from Assets in Place + Sum of PV of EVA from new projects

A Simple Illustration

- Assume that you have a firm with
  - I_A = 100
  - ROC_A = 15%
  - $WACC_A$ = 10%
  - $WACC_{New\ Projects}$ = 10%

  In each year 1-5, assume that $\Delta I = 10$ (Investments are at beginning of each year)

  $ROC_{New\ Projects}$ = 15%
- Assume that all of these projects will have infinite lives.
- After year 5, assume that
  - Investments will grow at 5% a year forever
  - ROC on projects will be equal to the cost of capital (10%)

Firm Value using EVA Approach

Capital Invested in Assets in Place	=$ 100
EVA from Assets in Place = (.15 – .10) (100)/.10	=$ 50
+ PV of EVA from New Investments in Year 1 = [(.15 -– .10)(10)/.10]	=$ 5
+ PV of EVA from New Investments in Year 2 = [(.15 -– .10)(10)/.10]/1.1	= $ 4.55
+ PV of EVA from New Investments in Year 3 = [(.15 -– .10)(10)/.10]/1.1^2	=$ 4.13
+ PV of EVA from New Investments in Year 4 = [(.15 -– .10)(10)/.10]/1.1^3	=$ 3.76
+ PV of EVA from New Investments in Year 5 = [(.15 -– .10)(10)/.10]/1.1^4	=$ 3.42
Value of Firm	**=$ 170.86**

Firm Value using DCF Valuation: Estimating FCFF

	Base Year	*1*	*2*	*3*	*4*	*5*	*Term. Year*
EBIT (1-t) : Assets in Place	$ 15.00	$ 15.00	$ 15.00	$ 15.00	$ 15.00	$ 15.00	
EBIT(1-t) :Investments- Yr 1		$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	
EBIT(1-t) :Investments- Yr 2			$ 1.50	$ 1.50	$ 1.50	$ 1.50	
EBIT(1-t): Investments -Yr 3				$ 1.50	$ 1.50	$ 1.50	
EBIT(1-t): Investments -Yr 4					$ 1.50	$ 1.50	
EBIT(1-t): Investments- Yr 5						$ 1.50	
Total EBIT(1-t)		$ 16.50	$ 18.00	$ 19.50	$ 21.00	$ 22.50	$ 23.63
- Net Capital Expenditures	$10.00	$ 10.00	$ 10.00	$ 10.00	$ 10.00	$ 11.25	$ 11.81
FCFF		$ 6.50	$ 8.00	$ 9.50	$ 11.00	$ 11.25	$ 11.81

Firm Value: Cost of Capital and Capital Invested

Assets in Place	$ 100.00						
New Investment	$ 10.00	$ 10.00	$ 10.00	$ 10.00	$ 10.00	$ 11.25	
Cumulative New Investment	$ 10.00	$ 20.00	$ 30.00	$ 40.00	$ 50.00		
Cumulative Total Investment	$ 110.00	$ 120.00	$ 130.00	$ 140.00	$ 150.00		
Return on Capital	15%	15%	15%	15%	15%	15%	10%
Cost of Capital	10%	10%	10%	10%	10%	10%	10%

Firm Value: Present Value of FCFF

Year	0	1	2	3	4	5	Term Year
FCFF		$ 6.50	$ 8.00	$ 9.50	$ 11.00	$ 11.25	$ 11.81
PV of FCFF	($10)	$ 5.91	$ 6.61	$ 7.14	$ 7.51	$ 6.99	
Terminal Value						$ 236.25	
PV of Terminal Value						$ 146.69	
Value of Firm	$170.85						

Implications

- Growth, by itself, does not creat value. It is growth, with investment in excess return projects, that creates value.
  - The growth of 5% a year after year 5 creates no additional value.
- The “market value added” , which is defined to be the excess of market value over capital invested is a function of tthe excess value created.
  - In the example above, the market value of $ 170.85 million exceeds the book value of $ 100 million, because the return on capital is 5% higher than the cost of capital.

EVA Valuation of Nestle

	0	*1*	*2*	*3*	*4*	*5*	*Term. Year*
Return on Capital	12.77%	12.77%	12.77%	12.77%	12.77%	12.77%	12.77%
Cost of Capital	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%
EBIT(1-t)	3,766.66Fr	4,066.46Fr	4,390.06Fr	4,739.37Fr	5,116.40Fr	5,523.38Fr	5,689.08Fr
WACC(Capital)	2,612.06Fr	2,819.97Fr	3,044.38Fr	3,286.61Fr	3,548.07Fr	3,830.29Fr	3,945.20Fr
EVA	1,154.60Fr	1,246.49Fr	1,345.69Fr	1,452.76Fr	1,568.33Fr	1,693.08Fr	1,743.88Fr
PV of EVA		1,145.10Fr	1,135.67Fr	1,126.30Fr	1,117.00Fr	1,107.76Fr	
						29,787.18Fr	
PV of EVA =	25,121.24Fr					PV of 1693.08 Fr growing at 3% a year	
Value of Assets in Place =	29,500.00Fr						
Value of Firm =	54,621.24Fr						
Value of Debt =	11,726.00Fr						
Value of Equity =	42,895.24Fr						
Value Per Share =	1,088.16Fr						

Discussion Issue

- What would the firm value be if the book value of the assets were understated at 14,750 Mil Sfr?
- What if the valuation were done in dollars?
- Would the value be much lower?

DCF Valuation of Nestle

	0	*1*	*2*	*3*	*4*	*5*	*Terminal Year*
EBIT (1-t)	0.00Fr	4,066.46Fr	4,390.06Fr	4,739.37Fr	5,116.40Fr	5,523.38Fr	5,689.08Fr
+ Deprec'n	2,305.00Fr	2,488.02Fr	2,685.58Fr	2,898.83Fr	3,129.00Fr	1,273.99Fr	1,350.42Fr
- Cap Ex	3,898.00Fr	4,207.51Fr	4,541.60Fr	4,902.22Fr	5,291.48Fr	2,154.45Fr	2,283.71Fr
- Change in WC	755.00Fr	814.95Fr	879.66Fr	949.51Fr	1,024.90Fr	417.29Fr	442.33Fr
FCFF	-2,348.00Fr	1,532.02Fr	1,654.38Fr	1,786.46Fr	1,929.03Fr	4,225.62Fr	4,313.46Fr
Terminal Value						151,113.54Fr	
WACC	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%
PV of FCFF	-2,348.00Fr	1,407.40Fr	1,396.19Fr	1,385.02Fr	1,373.90Fr	51,406.74Fr	
Value of Firm=	54,621.24Fr						
Value of Debt =	11,726.00Fr						
Value of Equity =	42,895.24Fr						
Value Per Share =	1,088.16Fr						

In summary ...

- Both EVA and Discounted Cash Flow Valuation should provide us with the same estimate for the value of a firm.
- In their full forms, the information that is required for both approaches is exactly the same - expected cash flows over time and costs of capital over time.
- A policy of maximizing the present value of economic value added over time should be the equivalent of a policy of maximizing firm value.

Year-by-year EVA Changes

- Firms are often evaluated based upon year-to-year changes in EVA rather than the present value of EVA over time.
- The advantage of this comparison is that it is simple and does not require the making of forecasts about future earnings potential.
- Another advantage is that it can be broken down by any unit - person, division etc., as long as one is willing to assign capital and allocate earnings across these same units.
- While it is simpler than DCF valuation, using year-by-year EVA changes comes at a cost. In particular, it is entirely possible that a firm which focuses on increasing EVA on a year-to-year basis may end up being less valuable.

Year-to-Year EVA Changes: Nestle

	0	*1*	*2*	*3*	*4*	*5*	*Term. Year*
Return on Capital	12.77%	12.77%	12.77%	12.77%	12.77%	12.77%	12.77%
Cost of Capital	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%
EBIT(1-t)	3,766.66Fr	4,066.46Fr	4,390.06Fr	4,739.37Fr	5,116.40Fr	5,523.38Fr	5,689.08Fr
WACC(Capital)	2,612.06Fr	2,819.97Fr	3,044.38Fr	3,286.61Fr	3,548.07Fr	3,830.29Fr	3,945.20Fr
EVA	1,154.60Fr	1,246.49Fr	1,345.69Fr	1,452.76Fr	1,568.33Fr	1,693.08Fr	1,743.88Fr
PV of EVA		1,145.10Fr	1,135.67Fr	1,126.30Fr	1,117.00Fr	1,107.76Fr	
						29,787.18Fr	
PV of EVA =	25,121.24Fr					PV of 590.67 Fr growing at 3% a year	
Value of Assets in Place =	29,500.00Fr						
Value of Firm =	54,621.24Fr						
Value of Debt =	11,726.00Fr						
Value of Equity	42,895.24Fr						
Value per Share =	1088.16Fr						

Discussion Issues

- In the above example, Nestle is expected to increase its EVA from 1154.50 Million Sfr in 1995 to 1246 Million Sfr in 1996.
- Assume that you are the analyst following Nestle and it announces a restructuring which will increase its EVA next year beyond 1246 million Sfr.
- Does it follow that the value of Nestle as a firm will increase?

When Increasing EVA on year-to-year basis may result in lower Firm Value

- 1. If the increase in EVA on a year-to-year basis has been accomplished at the expense of the EVA of future projects. In this case, the gain from the EVA in the current year may be more than offset by the present value of the loss of EVA from the future periods.
  - For example, in the Nestle example above assume that the return on capital on year 1 projects increases to 13.27% (from the existing 12.77%), while the cost of capital on these projects stays at 8.85%. If this increase in value does not affect the EVA on future projects, the value of the firm will increase.
  - If, however, this increase in EVA in year 1 is accomplished by reducing the return on capital on future projects to 12.27%, the firm value will actually decrease.

Firm Value and EVA tradeoffs over time

	0	*1*	*2*	*3*	*4*	*5*	*Term. Year*
Return on Capital	12.77%	13.27%	12.27%	12.27%	12.27%	12.27%	12.27%
Cost of Capital	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%	8.85%
EBIT(1-t)	3,766.66Fr	4,078.24Fr	4,389.21Fr	4,724.88Fr	5,087.20Fr	5,478.29Fr	5,642.64Fr
WACC(Capital)	2,612.06Fr	2,819.97Fr	3,044.38Fr	3,286.61Fr	3,548.07Fr	3,830.29Fr	3,948.89Fr
EVA	1,154.60Fr	1,258.27Fr	1,344.84Fr	1,438.28Fr	1,539.13Fr	1,648.00Fr	1,693.75Fr
PV of EVA		1,155.92Fr	1,134.95Fr	1,115.07Fr	1,096.20Fr	1,078.27Fr	
						28,930.98Fr	
PV of EVA =	24,509.62Fr					PV of 590.67 Fr growing at 3% a year	
Value of Assets in Place =	29,500.00Fr						
Value of Firm =	54,009.62Fr						
Value of Debt =	11,726.00Fr						
Value of Equity =	42,283.62Fr						
Value Per Share =	1,072.64Fr						

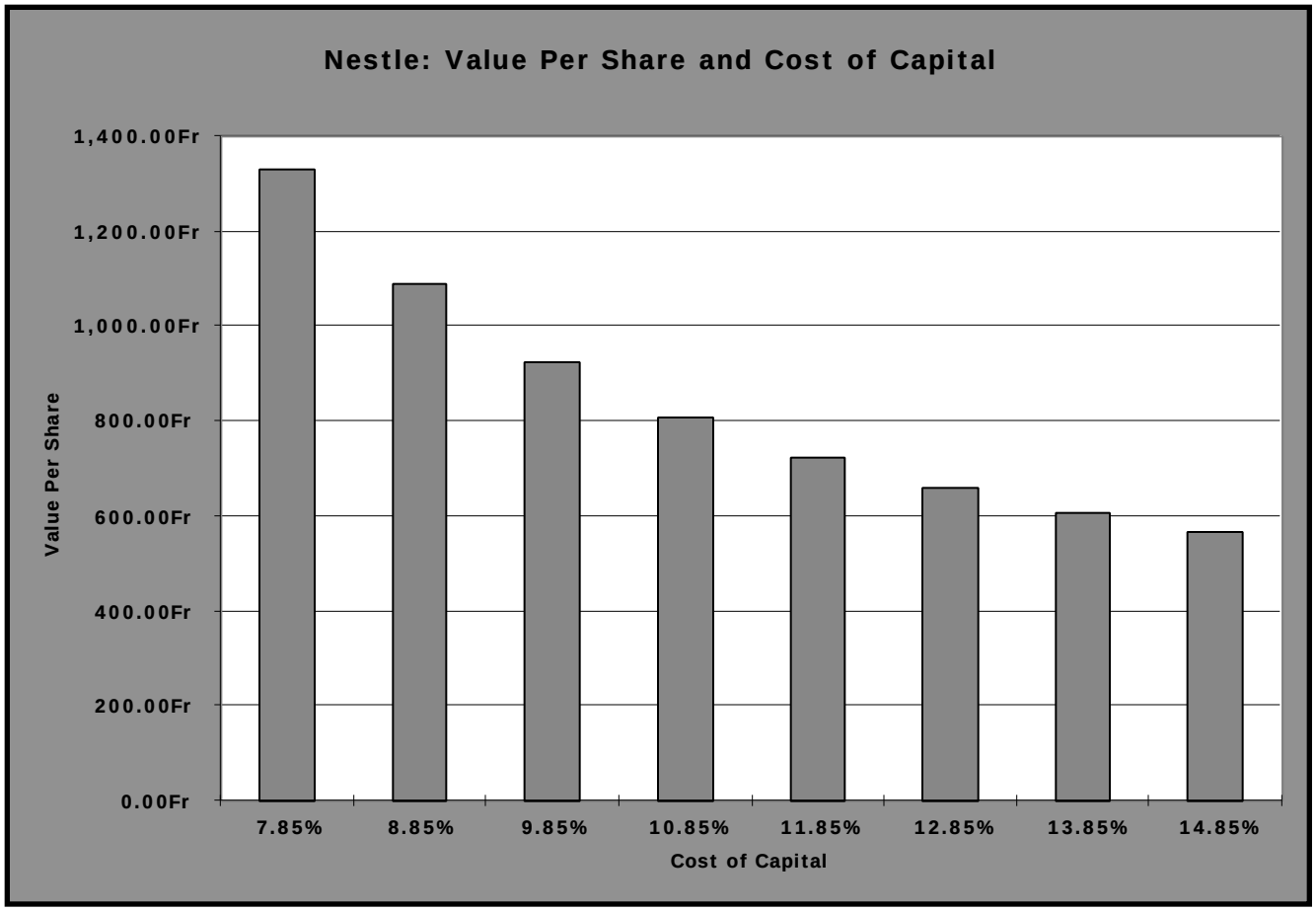
EVA and Risk

- 2. When the increase in EVA is accompanied by an increase in the cost of capital, either because of higher operational risk or changes in financial leverage, the firm value may decrease even as EVA increases.
  - For instance, in the example above, assume that the spread stays at 3.91% on all future projects but the cost of capital increases to 9.85% for these projects (from 8.85%). The value of the firm will drop.

Nestle's Value at a 9.95 % Cost of Capital

	0	*1*	*2*	*3*	*4*	*5*	*Term. Year*
Return on Capital	12.77%	13.77%	13.77%	13.77%	13.77%	13.77%	13.77%
Cost of Capital	8.85%	9.85%	9.85%	9.85%	9.85%	9.85%	9.85%
EBIT(1-t)	3,766.66Fr	4,089.94Fr	4,438.89Fr	4,815.55Fr	5,222.11Fr	5,660.96Fr	5,830.79Fr
WACC(Capital)	2,612.06Fr	2,843.45Fr	3,093.20Fr	3,362.79Fr	3,653.78Fr	3,967.88Fr	4,384.43Fr
EVA	1,154.60Fr	1,246.49Fr	1,345.69Fr	1,452.76Fr	1,568.33Fr	1,693.08Fr	1,446.36Fr
PV of EVA		1,134.68Fr	1,115.09Fr	1,095.82Fr	1,076.88Fr	1,058.25Fr	
						21,101.04Fr	
PV of EVA =	18,669.84Fr					PV of 590.67 Fr growing at 3% a year	
Value of Assets in Place =	29,500.00Fr						
Value of Firm =	48,169.84Fr						
Value of Debt =	11,726.00Fr						
Value of Equity =	36,443.84Fr						
Value Per Share =	924.50Fr						

EVA: The Risk Effect



Advantages of EVA

1. EVA is closely related to NPV. It is closest in spirit to corporate finance theory that argues that the value of the firm will increase if you take positive NPV projects.
2. It avoids the problems associates with approaches that focus on percentage spreads - between ROE and Cost of Equity and ROC and Cost of Capital. These approaches may lead firms with high ROE to turn away good projects to avoid lowering their percentage spreads.
3. It makes top managers responsible for a measure that they have more control over - the return on capital and the cost of capital are affected by their decisions - rather than one that they feel they cannot control as well - the market price per share.
4. It is influenced by all of the decisions that managers have to make within a firm - the investment decisions and dividend decisions affect the return on capital and the financing decision affects the WACC.

EVA and Changes in Market Value

- The relationship between EVA and Market Value Changes is more complicated than the one between EVA and Firm Value.
- The market value of a firm reflects not only the Expected EVA of Assets in Place but also the Expected EVA from Future Projects
- To the extent that the actual economic value added is smaller than the expected EVA the market value can decrease even though the EVA is higher.

Implications of Findings

- This does not imply that increasing EVA is bad from a corporate finance standpoint. In fact, given a choice between delivering a "below-expectation" EVA and no EVA at all, the firm should deliver the "below-expectation" EVA.
- It does suggest that the correlation between increasing year-to-year EVA and market value will be weaker for firms with high anticipated growth (and excess returns) than for firms with low or no anticipated growth.
- It does suggest also that "investment strategies"based upon EVA have to be carefully constructed, especially for firms where there is an expectation built into prices of "high" surplus returns.

When focusing on year-to-year EVA changes has least side effects

1. Most or all of the assets of the firm are already in place; i.e, very little or none of the value of the firm is expected to come from future growth.
   - [This minimizes the risk that increases in current EVA come at the expense of future EVA]
2. The leverage is stable and the cost of capital cannot be altered easily by the investment decisions made by the firm.
   - [This minimizes the risk that the higher EVA is accompanied by an increase in the cost of capital]
3. The firm is in a sector where investors anticipate little or not surplus returns; i.e., firms in this sector are expected to earn their cost of capital.
   - [This minimizes the risk that the increase in EVA is less than what the market expected it to be, leading to a drop in the market price.]

When focusing on year-to-year EVA changes can be dangerous

- 1. High growth firms, where the bulk of the value can be attributed to future growth.
- 2. Firms where neither the leverage not the risk profile of the firm is stable, and can be changed by actions taken by the firm.
- 3. Firms where the current market value has imputed in it expectations of significant surplus value or excess return projects in the future.
  - Note that all of these problems can be avoided if we restate the objective as maximizing the present value of EVA over time. If we do so, however, some of the perceived advantages of EVA - its simplicity and observability - disappear.