The pitfalls of EVA

Although EVA is a value based measure, and it gives in valutions exactly same answer as discounted cash flow, the periodic EVA values still have some accounting distortions

That is because EVA is after all an accounting-based concept, suffering from the same problems of accounting rate of returns (ROI etc.). In other words the historical asset values that distort ROI do distort also EVA values

The equivalence with EVA and the cash flow based investment and valuation tools NPV and DCF is due to the fact that in valuations the problematic historical asset values (book value) are irrelevant (cancel out) and only the cash flows are left to give the end result

EVA is based on accounting return

As the following formula:

EVA = (ROIC - WACC) * CAPITAL EMPLOYED

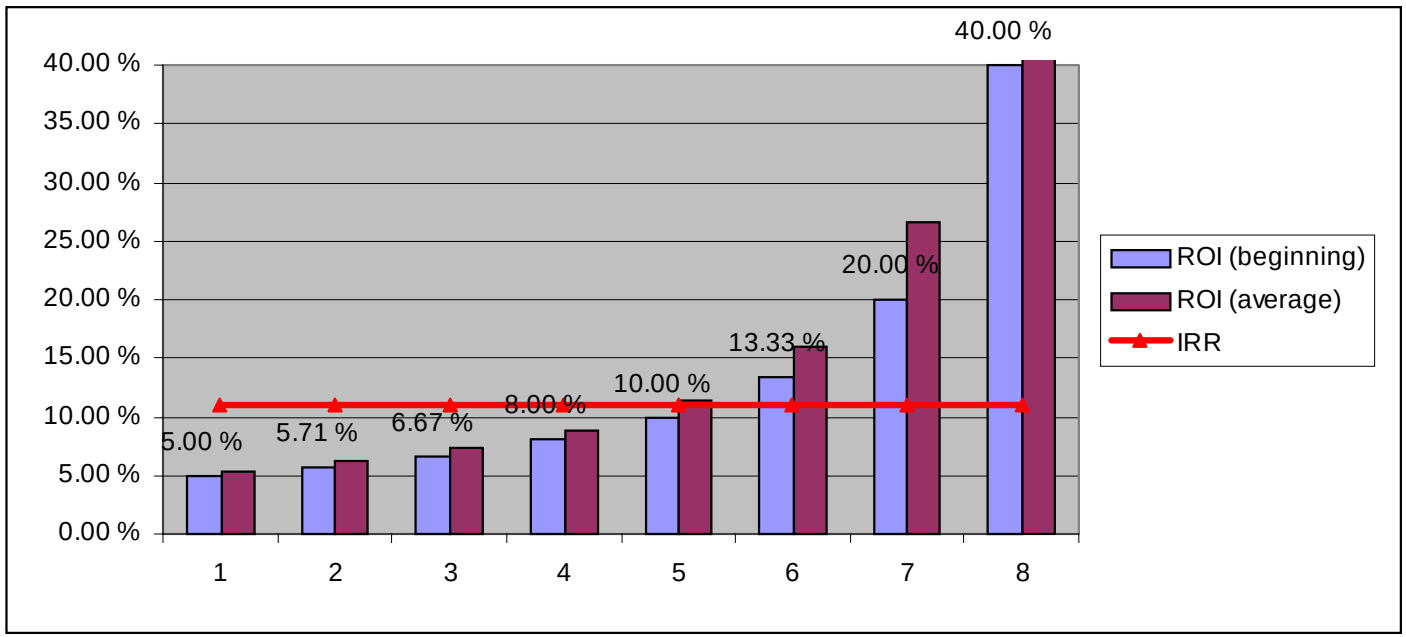
reveals, EVA is based on the accounting rate of return. Unfortunately accounting rate of return have at least two severe pitfalls:

- Wrong periodizing (EVA is divided unevenly between different years)
  - With normal depreciation schedules EVA (and ROI) tend to be small at the beginning of a project and big at the end of the project. Therefore companies with a lot of new investments have lower EVA than their true profitability would imply and companies with a lot of old investments have bigger EVA than their true profitability would imply
- Distortions caused by inflation, asset structure etc.
  - Historical asset values are distorted by inflation which affects also EVA values
  - As proved many times in financial literature; accounting rate of return is also without any inflation unable to describe (even on average) the true underlying rate of return. The extent of this problem depends on the asset structure (the relative proportions of current assets, depreciable assets, undepreciable assets) and on the length of the investment period.

The problem of unevenly divided EVA (1/3)

The accounting rate of return (e.g. ROI) is far from perfect in estimating the true rate of return of a company

If we examine a single project then ROI is a poor estimator or the true rate of return, since at the beginning of the project when the capital base is big, the ROI is small and then at the end when the capital base is small then the ROI is big. Following figure illustrates this problem. It shows the ROI of a 8-year project producing constant operating income and a true total return of 11% (estimated with IRR).



The problem of unevenly divided EVA (2/3)

Data for the example (figure on the previous page):

	Beginning Investment		1200							
	Duration (years)		8							
	Gross margin per yea		210							
Cash flows		Year	1	2	3	4	5	6	7	8
	Investment		-1200							
	Gross margin		210	210	210	210	210	210	210	210
	Total Cash flow		-990	210	210	210	210	210	210	210
	Depreciation		-150	-150	-150	-150	-150	-150	-150	-150
	Operating income		60	60	60	60	60	60	60	60
Balance sheet										
	Beginning assets		1200	1050	900	750	600	450	300	150
	Ending assets		1050	900	750	600	450	300	150	0
Accounting returns										
	ROI (beginning)		**5.00%**	**5.71%**	**6.67%**	**8.00%**	**10.00%**	**13.33%**	**20.00%**	**40.00%**
	ROI (average)		**5.33%**	**6.15%**	**7.27%**	**8.89%**	**11.43%**	**16.00%**	**26.67%**	**80.00%**
True return										
	IRR		**11.0 %**	**11.0 %**	**11.0 %**	**11.0 %**	**11.0 %**	**11.0 %**	**11.0 %**	**11.0 %**

The problem of unevenly divided EVA (3/3)

As the earlier slides illustrated ROI can not describe the return of a single project since at the beginning of the project, when capital base is still big, the return is low and when the capital base gets smaller and smaller ROI shoots to the skies.

Of course no firm is made of one single project and thus projects started at different times even out this problem a great deal.

However, a firm have seldom totally even investment schedule. So it is seldom the case that a firm invests every year the same amount of money in fixed assets and that it would then have assets of all ages smoothly.

Normally the assets have emphasis either on new investments (companies growing heavily) or on old investments (consider a old unit e.g. an old paper mill that has already depreciated almost all of its initial fixed investment)

Thus the accounting return is often either understating or overstating the true return of the enterprise

Distortions caused by inflation, asset structure etc.

It has been proved many times in financial literature that ROI (or any other accounting return) is also **on average** a poor estimator of the true underlying rate of return (Harcourt (1965), Salomon and Laya (1967), Livingston and Salomon (1970), Kay (1976), Van Breda (1981), Fischer and McGowan (1983), Fisher (1984), Kay and Mayer (1986), Rappaport (1989), De Villiers (1989, 1997)

That is because

- Historical asset-values can not describe accurately the current value of assets tied into business (inflation, different depreciation schedules etc.)
- ROI itself does not take into account the time value of money -> therefore e.g. the decision to activate R&D costs or to subtract them at once in the income statement effects ROI (ROI is bigger in the long run if R&D cost are subtracted at once and not activated on the balance sheet)

The extent of this distortion in accounting rate of return (and thus in EVA) depends on the asset structure (the relative proportions of current assets, depreciable assets, undepreciable assets) and on the length of the investment period, depreciation policy etc.

Paradox of EVA

EVA is completely correct with valuations but similarly it can have some accounting distortions

This might sound a little paradoxal, but it has a simple explanation:

Look at the terms of EVA valuation formula:

Market value of a company =

Book value of equity + current value of future EVA

EVA valuation formula has two interacting components (book value and future EVA). By increasing book value we decrease the future EVA values through increased capital costs (and vice versa).

Actually we can show that component “book value” cancels de facto out of valuation calculations and thus in EVA valuation formula the only thing that remains is cash flow. Book value has no meaning to the value.

Paradox of EVA (continue...)

EVA is a measure that produces exactly the same value of a given company than DCF-method and exactly same NPV-value of a given investment project than NPV-method. Still the periodic values of EVA might suffer greatly from accounting distortions and as a performance measure EVA is far from cash flow based measure

In performance measurement the distortions of EVA should be considered, since there they *do not* cancel out

How are different industries affected with these problems?

Industries with very cyclical investments (not smooth over the years) and / or industries with very long investment horizon suffer most from these pitfalls of EVA. This kind of industries are e.g.:

- Telecom. forestry products, pharmaceuticals, semiconductors

Industries with a lot of current (instead of fixed) assets and with short investment period should not be so worried about these pitfalls.

- Because current assets represent a large amount of total assets, then also the value of assets is close to current value of capital tied into business
- Short investment period does not give time for distortions

This kind of branches are e.g.:

- Personal computers, banking, food and beverages, retailing and publishing, consulting, engineering, constructing

How can you cope with these distortions of EVA

You have at least two good ways to try to fix these distortions

(These methods (1 and 2) are totally different and can not be used at the same time / in similar cases as alternatives)

Method 1:

- Modify your depreciation schedule so that the periodizing problem vanishes: When depreciations are flat or emphasized at the beginning of investment period -> EVA emphasizes at the end of the period. If depreciations are low at the beginning (compensating high capital cost) then this problem of "unevenly distributed EVA will vanish)

Method 2:

- Estimate the current value of assets and use this as a basis of calculations (instead of book value of assets)

Another possibility is that you just assess these distortions and thereafter measure your performance with EVA just as before (when you know the direction of the problem and have some - although vague - estimation about the effects on your EVA you'll probably do quite well even though you do not correct the problem)

Consideration (not trying to fix this but considering these effects in interpreting information)

The importance of these distortions to companies

These presented pitfalls of EVA can often be ignored since they are in many cases small and furthermore it is justified to state that:

> It is usually always good when EVA increases and always bad when EVA decreases, thus the change of EVA is often more important than the absolute level

However it is vital for every CFO to realize that EVA has its weaknesses and thus it is not the ultimate truth and it does not **always** tell you the amount of wealth created or destroyed

With bonus systems these pitfalls have more importance, since thereby bonuses can be divided even after wealth destruction with a poorly structured bonus scheme

Understanding the pitfalls helps companies to understand both the concept of EVA and concept of profitability better