A new technique for Visualizing and Quantifying Shareholder Value

> **Many of the patterns of nature we can discover only *after* they have been constructed by our mind.**
>
> Friedrich von Hayek

Summary
Authors show a technique for imaging and quantifying values by a vector, which is defined by two axes. One ax shows the material and the other ax shows the immaterial aspects. Further a mathematical link between these two axes is established. This kind of understanding the value and its generation leads to new insights in valuing enterprises and enlarges the basic arguments for decision makers.

Content:

1. **About shareholders**
2. **About values**
3. **About enterprise values**
4. **About shareholder values**
5. **Outlook**

Working Paper

1. About shareholders

Shareholders are either natural or juristic persons and owner of a paper that grants them ownership of a juristic person. This paper may be bought and sold for money. Sellers and buyers agree prices for this paper. Mostly on a stock market but also outside.
Several reasons exist to buy shares or other valued papers. The main reason is to participate in the increasing values of the papers.

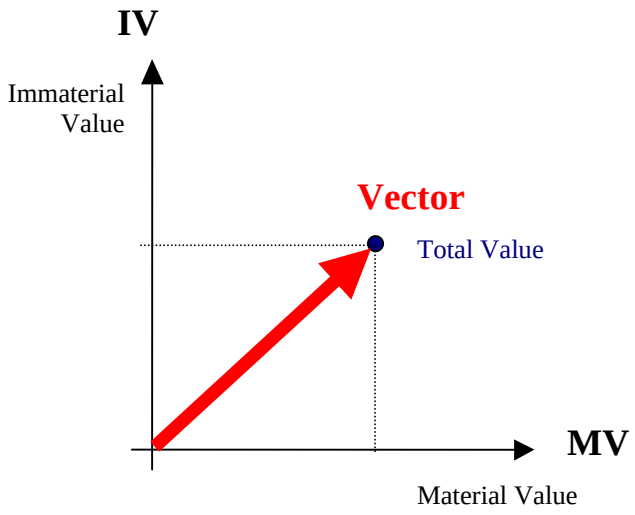
2. About values

Usually the term "value" is used for an amount of money a person is spending for goods or services – or shares of an enterprise.
In the daily business it is relatively easy to determine the value for fruits, cars and so on. Synonym with this kind of value is the word "price" for products.

But lets take a look more profound into the meaning of the term value in the buying process. Buying is the word for changing money against other goods and services. Seller sells something and the buyer gives in turn an amount of money.
The buyer him selves makes **two** valuations. One for the value of the item to be bought (value 1) and one for the value of the necessary amount of money (known as "price" from the sellers view and as "cost" from the buyers view) he has to spend (value 2). The buying process will be realized only if the buyer concludes, that value 1 (the value of the goods) is at least as high as value 2 (the value of the money), that is [(value 1) ≥ (value 2)].
It is quiet evident, that the amount of money **is not** the value of the therefore exchanged goods. The money is the object that changes hand – value is a feature that a man attaches to the object money.
It is therefore evident, that value exists only in connection with people. No value exists without a valuing people, either in representing his personal intentions or in charge of legal entity.
Value is an intangible object. Value is a subjective object that depends on an individual.

The basic problems we face in trying to make a map for intangible items are, that there are no existing standards. That means we have to invent a basic system and methodology for structuring and quantifying intangible goods. But this problem can be solved by taking some help from the methodology of the classical natural sciences in chemistry or physics.
So for describing and giving this intangible object quantifying metrics we take some analogies out of the solution instruments that since about 100 years are common in the physics area. The physicians had more than once to develop a system for understanding intangible "phenomenon" or "objects" like electromagnetism, x-rays, electrons and so on. Once they have developed a first system they were able to understand and use the physical phenomenon. Same can be said to other sciences. They develop a model and they improve constantly their explaining models to explain more and better the real reality.

For better understanding business systems and interactions it is proposed to understand – and describe - the value as a vector with two axes. One ax for the material part of the value (representing price, cost..... with the unit of the currency [$, CHF……]) – and one ax for the immaterial part of the value (representing Knowledge, expectations, image….. with the unit [i$, iCHF……]).



For mathematical operations it is necessary to introduce the following definitions.

Total Value	=	$\boldsymbol{MV + IV}$
Marketvalue	=	$\sqrt{MV^2 + IV^2}$
Buyersvalue	=	$\sqrt{MV^2 + IV^2_{Buyer}}$
Sellersvalue	=	$\sqrt{MV^2 + IV^2_{Seller}}$

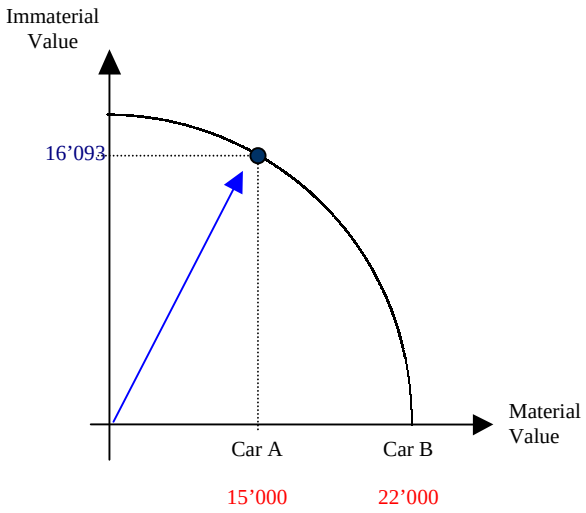
Example:
Take an Object as for example two cars. Car A with a price of $ 15'000.-- and car B with a selling price of $ 22'000.--

The "immaterial advantage" for buying the car B is:

$$\sqrt{22'000^2 - 15'000^2} = 16'093\ i\$$$

The term "value" stands for an intangible object, described by a vector with two axes. One for the "material part" and one for the "immaterial part".
The "material part" is given by the cost/price-scale and the "immaterial part" is determined by the "arc-technique".

More precisely, the immaterial part of the vector is at least 16’093 i$, because the buyer could have paid more – say $ 25’000.—.
That means, if the buyer would have paid $ 25’000.— for car B, the immaterial part of the value would have been 20’000 i$.



3. About enterprise values

The classic art of "Measuring and Managing the Value of Companies" can be read in the book "Valuation" (John Wiley & Sons, Inc; Tom Copeland, McKinsey & Company).

You can find the value-driver formula on page 278 (second edition).

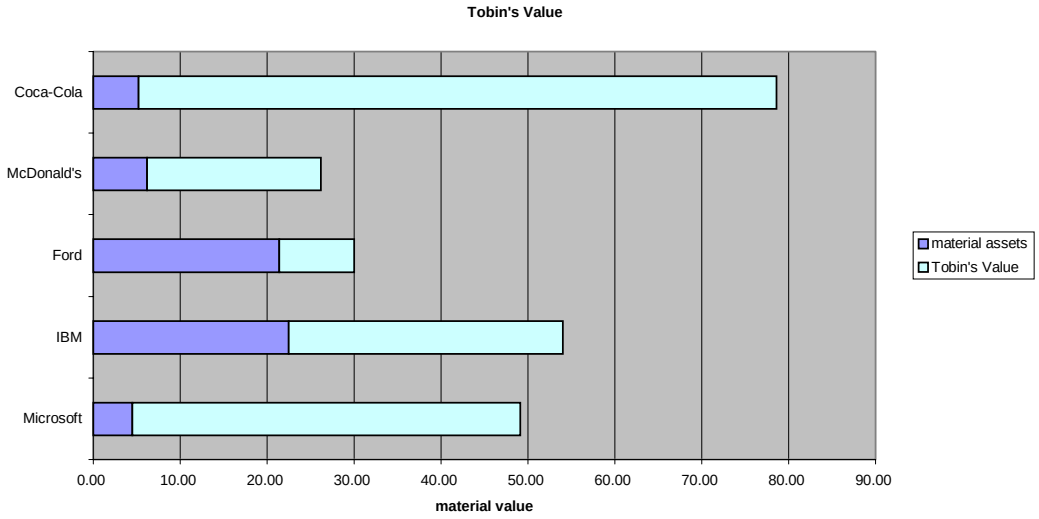
CV =

$$\left[\frac{NOPLAT_{T+1}\left(1-g_A/ROIC_A\right)}{WACC-g_A}\right]\left[1-\left(\frac{1+g_A}{1+WACC}\right)^{N-1}\right]+\left[\frac{NOPLAT_{T+1}\left(1+g_A\right)^{N-1}\left(1-g_B/ROIC_B\right)}{\left(WACC-g_B\right)\left(1+WACC\right)^{N-1}}\right]$$

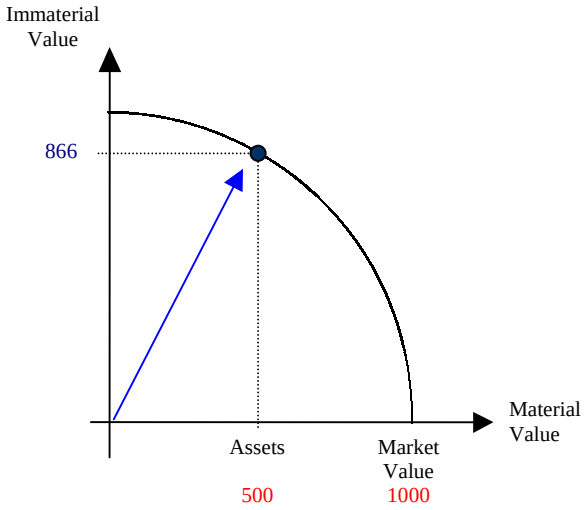
There is no need to explain this formula. McKinsey stipulated it and it was expressed (by McKinsey of course) that this is the ultimate formula for valuing enterprises.
But it is easily recognizable, that this formula has no parameter for people - and that therefore an important factor is missing. This means, that this formula has a systematic failure, which will come more and more to attention in intelligent enterprises.
This formula may work in a fully automated enterprise. In other enterprises it is like weather forecasting in the Alps. It is a dead-end street…..

4. About shareholder values

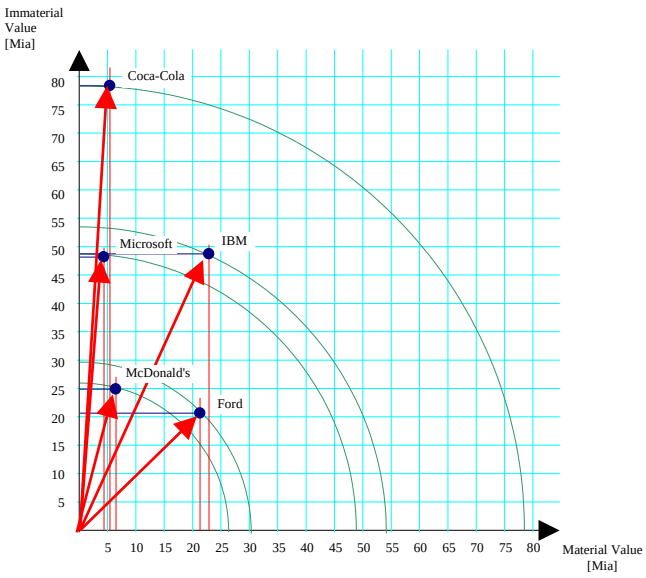
There are some approaches to a definition of shareholder value.



The difference between the stock price and the material actives is some sign for intangible values.
Taken an enterprise as an object we can determine the intangible value for shareholders as follows.



Next picture shows the vectors for five enterprises from the point of view of the shareholders.

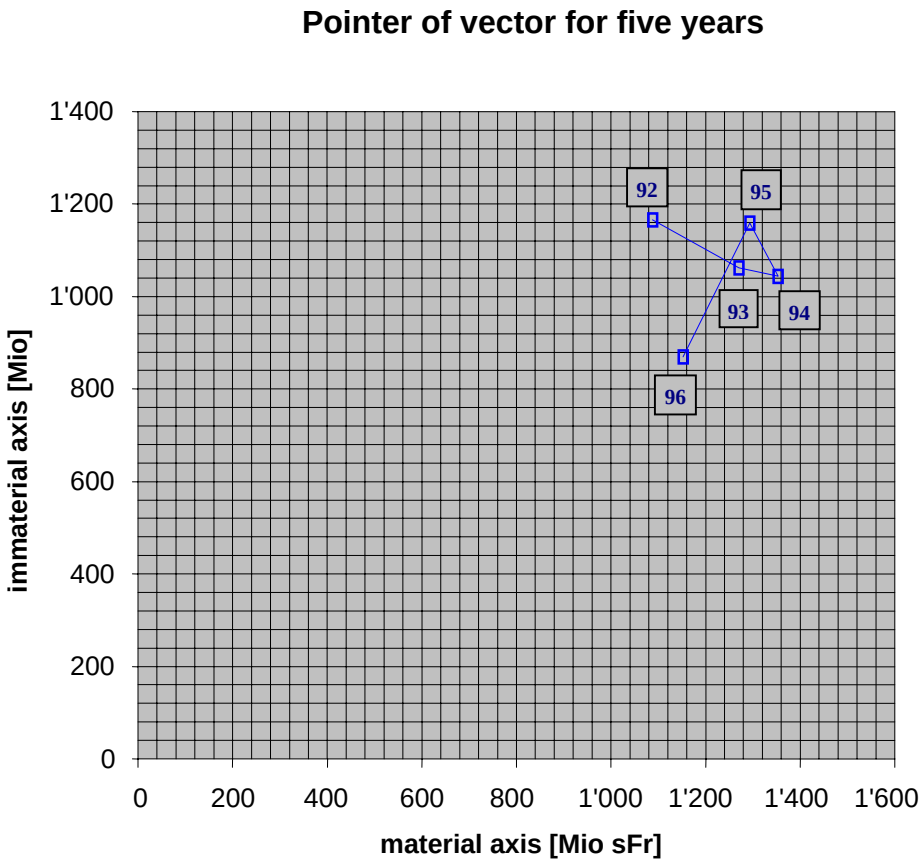


	A	C	B	T	T*	S	N	V = A + Bi
Microsoft	4.50	49.10	48.89	44.60	44.60	4.29	10.87	V = 4.50 + 48.89 i
IBM	22.50	54.00	49.09	31.50	31.50	17.59	2.18	V = 22.50 + 49.09 i
Ford	21.40	30.00	21.02	8.60	8.60	12.42	0.98	V = 21.40 + 21.02 i
McDonald's	6.20	26.20	25.46	20.00	20.00	5.46	4.11	V = 6.20 + 25.46 i
Coca-Cola	5.20	78.60	78.43	73.40	73.40	5.03	15.08	V = 5.20 + 78.43 i

Legende:	A = material Assets	(Input)
	B = immaterial Assets	
	C = Börsenkapitalisierung	(Input)
	T = Tobins "Intellectual Capital"	
	T* = intellektual Assets (Knowledge +)	
	S = Experience (Skills, Können)	
	N = tan α = Nutzen	

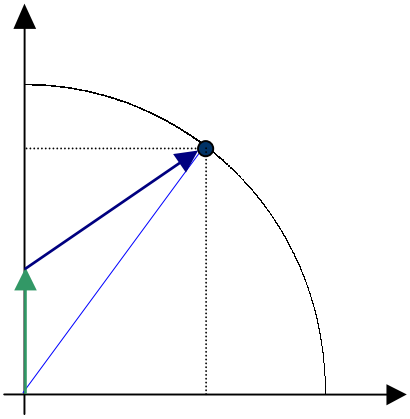
Above picture is a static one. Of course one could easily imagine, that in reality the peak of such a vector is constantly moving around. So it is possible to show is the enterprise loosing or gaining immaterial or material Capital.

Example below shows a part of ABB.



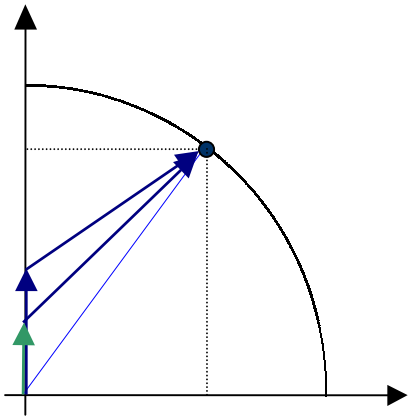
The answer for the question – "What happens in the year 1996?" – is easy: Part of enterprise sold. It is after all a philosophical question if this loss of immaterial values is compensated by the price received for the sold enterprise.

The difference between market value and assets (known as Tobin's Value) is a shareholders expectation of the value of an enterprise. This expectation is intangible and we can show the value of an enterprise by the addition of two vectors. One vector shows this immaterial expectation and one shows the skills to make business work.

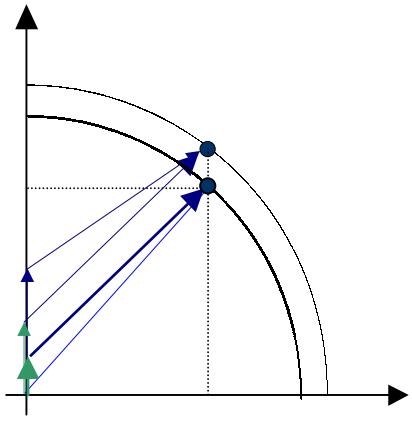


One vector for the immaterial part of the values – the pure academic intellectual capital, the rights, the expectations of the shareholders and one vector for the skills to make pure immaterial part work in combination with the other resources.

The main interest in investing into shares of an enterprise is the expectation of the shareholder that the price of a paper raises. With other words the profit expectations of the shareholders.
This profit expectation depends mainly on information of business analysts and general expectations of the shareholders themselves. With the introduction of the SPE (Shareholders Profit Expectation) it is possible to determine a more realistic intangible value for an enterprise as shown in the figure below.



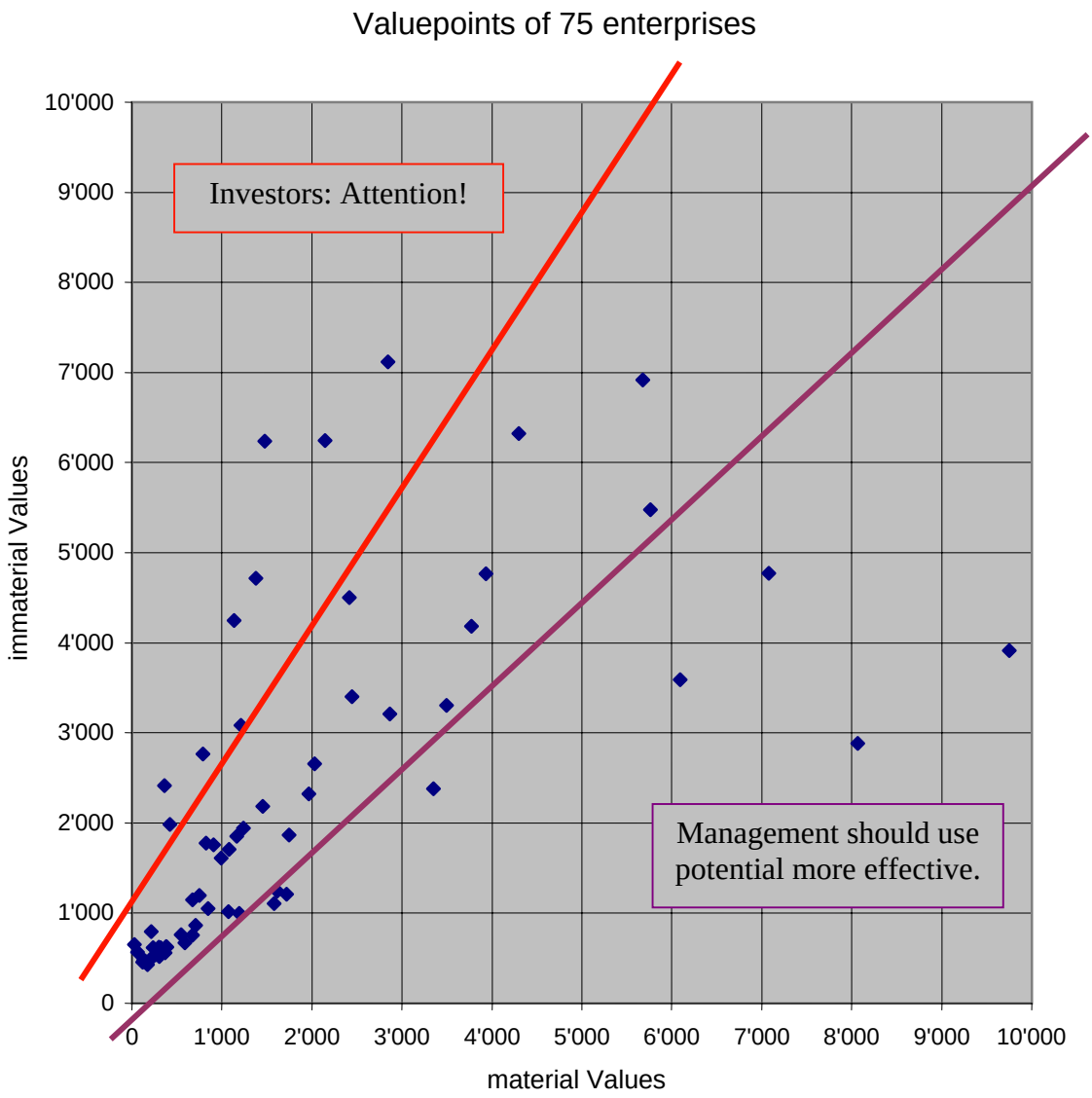
Increasing and decreasing the market value of an enterprise results in a parallel shift of the Corrected enterprise value.



This parallel shift means, that the original value of the enterprise remains intact until management fears, that shareholders would throw them out.
Three possibilities are for reactions:

- Parallel shift of vector by hot air through marketing department increasing SPE (works well only 3 times with same management)
- Enlarging vector by buying (or announce to buy) other enterprises.
- Enlarging the vector by using the resources more effective (not only more efficient).

Analyzing enterprises with the above mentioned instruments leads to fundamentally new decisions on the side of the managers as well as of the side of shareholders, which have nowadays a better/good working instrument for showing overpriced papers.



Englische Ausdrücke:

"Legal entity" für juristische Person

Begriffe:

CAPM Capital Asset Pricing Model; McKinsey Valuation S. 258
NOPLAT Normalized net operating profits less adjusted taxes

Economic Profit = Invested Capital x (ROIC – WACC)
Free cash flow = NOPLAT – Net investment

$$ROIC = \frac{NOPLAT}{Invested\ capital}$$

Shareholder value, here calculated as market value added (MVA); Valuation S. 4

Rösel

What are the questions?

The principal questions are:

a) What does the term value stand for?
b) What are the parameters, which determine and increase the value of a paper?