

# FUNDAMENTAL DIFFERENCES OF THE DISCOUNT RATE’S CONSTRUCTION

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## SUMMARY

*The lecture points out the contradiction, which hides behind the yield requirements interpreted by the ‘shareholder aspect’ and the opportunity cost resting on microeconomic bases. The economic literature was consistent for a long time in the question that the time-value of invested money is independent from the capital-structure. The investment- efficiency calculations are not influenced by the decision concerned with the capital-structure.*

*As the ‘shareholder aspect’ came to the fore, we can meet more often efficiency-calculations, where different yield requirements concerned with the equity capital and credits are charged, for the equity capital profitability requirements containing also the risk-premium requirements (as a rate independent of the capital-structure), for the credits only the returns of interest. Considering, that the prices of products realising on the competitive market do not depend on the capital-structure, the yield-requirement drafted on the principle of opportunity cost must be also independent of that.*

*A further feature of the differentiated yield-requirement is that the bigger the proportion of the credit is by its application, the larger is the Net Present Value calculated for the same action (assuming an economical alternative otherwise). Considering, that here the average yield-requirement is lower than the calculate rate of interest, in case of an unprofitable action can also arise an NPV greater than zero according to the microeconomic approach.*

The uncoordinated development of the functional segments in the corporate management plays a major role in the process that the business economics literature became controversial in many questions. Such as, the problem of required capital yield interpretations and that of charging of yield requirement. The lecture – within its limited boundaries – picks only one from this set of problems: the interpretation and charging of different yield requirement of debt during the accounting for managerial decisions.

## 1. THE “SHAREHOLDER APPROACH” GAINING GROUND

The primary question of accounting for managerial decisions is that whether the given topic meets the requirement of returns. Then comes a task of creating a rank of priority where the first, second, third, etc. places should be determined. Also, in relation to the capital investment the “time value of money” has to be recovered. So in case of accounting for investment decisions it is necessary to clarify preliminarily the statements concerning with showing the time value of money in numbers.

The business economics literature had been unanimous for a long time about the question that the time value of

money load into investments was independent of the capital structure. The accounting for investment decisions were not influenced by the possibilities of selection related to the capital structure. The degree and ratio of debt did not play a direct role in the formation of capital yield requirements.

A financial theorem has become stressed stating that the cost of equity is the rate of return that stockholders require on the common stock, and the cost of debt is the interest rate investors require on credit issues. First of all with gaining ground of the “shareholder approach” and by the fact, the literature of financial management becomes more and more significant this shareholder approach gains ground in the business economics literature as well.

In the practice oriented foreign and domestic resource studies you can find a strong tendency according to which only the interest should be charged to debt, because of the fact the creditor expects only this much. Nowadays this conception is often applied to the accounting for investment decisions too.

There are various actual calculation methods, yet many of them have a confusing background. The two characteristic proceedings of the consequent treatment of different capital yield requirements are the following:

- a, the automatic yield requirements differentiation,
- b, the charging of yield requirement counted as the average rate of the two yield requirement.

a, According to a frequent logical formulation of the accounting for investment decisions soaked with the “shareholder approach” the sum of debt should be presented among the revenues (according to the real date of the borrowing) and the due interest on debt as well as the sum of the installments should be treated among the expenditures. This automatically means that only the cost of interest is charged as a yield requirement of debt capital (over the return of nominal value). This is the case of automatic differentiation of capital yield requirements.

b, In the case of the other consequent calculation method, the traditionally treated total sum of investment is represented as the starting sum of capital investment and the interest is taken into account among the yields, as the part of revenues to. However the weighted average cost of capital is taken account as the capital yield requirement. (The “costs” are: yield requirement of equity and interest of debt.)

Concerning the original accounting for investment decisions, cash flow yield consisting of pre-tax earnings was typically applied during the analysis. This way the problem of time verticality became penetrable, in other words you could easily - without contradictions – switch between the categories of critical lifetime, critical output value, critical sum of investment, critical cost of material etc. And this assured the possibility of rethinking of complex relations as well.

The solutions springing on the ground of the “shareholder approach” leave only a narrow segment for reconsideration. In those calculations, where the shareholder defines his collectable incomes on after-tax revenue, the yield requirements are determined on tax revenue as well (though quantification is not always done so), which assumes that the life expectancy and the sum of depreciation are fixed. This method is presented rather like a plan-calculation and can answer liquidity questions, yet it can generally not replace the thoughtful and creative methods of accounting for managerial decisions. (As far as my knowledge is concerned the literature does not deal with the usefulness of the change of methods and not even touches this question either. However, in practice those uniplanar, theoretically not well based calculations are pushing into the background the widely applicable efficiency analyses.)

## 2. THE CAPITAL YIELD REQUIREMENT SHOULD NOT DEPEND ON THE CAPITAL STRUCTURE

### 2.1. THE PRINCIPLE OF OPPORTUNITY COST IN THE MANAGEMENT

In case of the scanty resources with alternative possibilities for consumption, the decision relating to the fulfillment of certain possibilities means that at the same time other economic activities cannot be executed at all, or to only a small degree, as far as the possibilities are concerned. So,

because of the scarcity of the resources the fulfillment of some activities means a withdrawal from other activities. This means that you have to give up the yields of the economic activities that were not carried out. The theory calls the globally interpreted yield effect of the alternatively executable topics opportunity cost, that is a withdrawal from the not executable actions and their yields by choosing another given version. By its utilization in other fields, the reachable yield may cover various economic content, therefore the opportunity cost has many concretizations. The latter comes evidently from the definition of Samuelson and Nordhaus too: “The opportunity cost of a decision consists of the things that are given up by taking that particular decision rather than taking an alternative decision.”<sup>1</sup> – coming upon a decision the people give up many things – by looking at its characteristics – which at the same time would come into play in other decisions.

One of the interests of the opportunity cost is the possibility of concretization based on various economic content. During the calculation of return requirement the type of the entrepreneurship decides about which concretizational content opportunity cost can be usefully applied. An entrepreneurship faces only that version which can be interpreted for the given circle of entrepreneurship. An other interest is seen if this is interpreted according to a given economic content a decision has as many opportunity cost as many yield possibilities of the real topics one loses in order to carry out one.

In respect to the fact that the knowledge of a single lost possibility cannot provide the criterion of a good decision, yet the exploration of the whole possible versions’ yield effect could even take for years. In practice, in order to determine the threshold value that brings yield after a good decision one takes the average value of the opportunity cost.

### 2.2. THE COMPONENTS OF CAPITAL YIELD REQUIREMENT

By utilizing the opportunity cost defined as the yield of capital forms the minimum criteria of return requirement. In addition to the costs derived from expenditures the capital’s average opportunity profit has to be refunded in the sales revenue of the to-be-carried out version.

The calculated rate of capital yield requirement describing the expected operating profit rate economically consists of two main parts: the price of capital utilization and the risk premium requirement. (By the old Hungarian term risk premium is named entrepreneurial profit.)

$$i = i_h + i_v$$

where:  $i$  = calculated rate of capital yield requirement (“discount rate”)

$i_h$  = estimated price for use of capital

(per one unit of capital)

$i_v$  = rate of risk premium requirement

<sup>1</sup> P. A. Samuelson – W. D. Nordhaus: *Economics*. McGRAW-HILL Book Company, New York, Twelfth Edition, 1985, p. 469.

For the sake of simplification the price of capital utilization is calculated on the basis of the risk-free rate realized on public securities. In practice however, the price for use of capital differs from the risk-free rate. The creditor and the consumer of debt – because of the creditors are secondary risk holders – share the risk premium requirement. This sharing does not affect the height of the calculated rate of capital yield requirement, but enriches its inner structure as opposed to the simple structure mentioned above. If we estimate – for the sake of simplification – the price for use of our capital and that of the debt with the effective interest rate (in case of more interest rates, we take their average) the risk premium requirement will differ somewhat from the theoretically pure content. Yet, this does not touch the capital yield requirement calculations since this simplification does not affect the aggregate sum of operating profit requirement. (The risk premium requirement rate is counted by the subtracting the price for use of capital from the calculated rate of capital yield requirement.)

Lack of this simplification we would have to build up the calculated rate of capital yield requirement from three parts: the risk-free rate; risk premium charged by the creditor; and the risk premium requirement above the mentioned two parts.

By the application of adjusted calculations it is straightforward to see that the risk premium requirement concerning the debt is somewhat smaller than its owners' equity. As a secondary risk holder, the creditor also holds some risk; that is why it imposes a higher charge for use of money than the risk free rate. However, this does not affect the sum of capital yield requirement and that of the operating profit requirement. It only touches the structure of the risk premium requirement and the estimated price for use of capital in the operating profit requirement, which in fact has no practical importance. (The accurate calculations would be distracted if the costs of debts are not homogenous. Even if we used their average our calculations still would not be totally accurate due to the significant differences between the expenses of administration.)

The purposefully applicable calculated rate of capital yield requirement can be classified according to the investment categories with different corporate risks.

### 2.3. THE CAPITAL STRUCTURE AND YIELD REQUIREMENT STRUCTURE

The capital yield return requirement equivalent to the average level of opportunity cost is to be interpreted independently of the form of capital ownership. The price of a competitive market product should not depend on the structure of capital ownership.

In case of the owners' equity the calculated rate of capital yield requirements are totally concretized as profit requirement. The debt's charge for use takes the form of cost, yet the amount by which the charge for use of capital is smaller than the calculated rate of capital yield requirements consists of risk premium requirement

concerning the debt. In other words, in case of different financing versions of a given activity, only the practical forms of appearance of the part of the calculated rate of capital yield requirements defined as the charge for use of capital will change, while the referring sum will remain the same. The rate of average opportunity cost is primary, its structure however, holds secondary information. Assumable, the classic accounting for investment decisions derive from this basic relationship where there is no differentiation taken into account between owners' equity and debt. The efficiency of topics is not influenced by the possibilities of capital structure.

It is a frequently raised idea that the change of the financing structure touches the risk questions as well. This is, of course, true, yet, in this case it is not the product market risk of a given activity that changes but that of the financier. It manifests primarily in the share of requirement of risk premium rate. Since this action does not affect the product market risk of the given economic activity, its calculated rate of capital yield requirements will not change either.

This relationship has a great importance to the methodology of decision preparing calculations. By the fact that labely or not labely done charging of capital yield according to the calculated rate of capital yield requirements lead to the same numerical result. The return requirement and its fulfillment could even be correctly studied without the knowledge of the capital structure and, more precisely, that of the financing background.

The exploration of the questions of financing may be narrowed down to the circle of those decision versions, which provisionary meet the return requirements set up by the basic value of a good operation. On this basis, then, one can get more easily to the development of the most favorable financing version that offers the greatest yield. Of course, the relevant financing plans are formed according to the financing background. (The counter value of use of debt is paid to the creditor. However, the resource of fulfillment should be presented among the revenues of the capital user. Since the pace of remittance does not equal to the pace of the return, the financial plan should contain the liquidity calculations.)

Among the inner components of the calculated rate of capital yield requirement only that one's appearance is variable which means the price of capital consumption. This takes the form of profit return requirement or cost return expectation as a function of capital ownership.

Though the change in capital structure influences the total corporate cost, it does not affect the sum of return requirement – interpreted as revenue – representing the threshold value of the good management. Since the charge of debt takes the form of cost (other conditions unchanged) the higher the ratio of debt, the higher the total cost of the same activities. However, this only touches the inner structure of the return requirement in a way that it shows that for the same sum of capital and of the same amount of charge of capital use how much takes the form of cost return requirement and how much becomes the profit return requirement.

### 3. THE SUM OF RISK PREMIUM EXPECTATION SHOULD NOT CHANGE

The equity is the entrepreneur's financial investment (along with its increased value over time) and at the same time the primary source of cover for the absolute loss. (The degree of a business' risk assumption may exceed the value of equity.) The debt is a kind of financial source – permanently or temporarily used by the business unit – that bears risk only at the time of enterprise liquidation. (Some of the risks may appear in relation with the bankruptcy agreement. At this time the goal is to go for a smaller disadvantage to avoid greater loss.)

In those economic actions, which are financed by credit the risk is taken by the user to the debit of equity, so the counter value of the assumption of risk should be realized on his side. If it does not, that is the return requirement defined by the principle of opportunity cost is not realized, the principle of “financing an activity from credit” is uneconomical.

However, making use of credit one can reach the same amount of revenue with less equity. If the interest on credit is smaller than the rate of capital yield, the profitability of the equity through credit could be greater. However, this has a price since the equity takes the primary risk. If the credit plays a part in the system, the equity then is responsible for a higher risk. The counter value of this higher risk is a greater profit yield on equity.

If the strategists identify themselves with the principle of decrease return requirement concerning debt the efficiency of financial policy falls because uneconomical versions also could get preferred. By applying this principle, if the debt ratio increases the average capital yield requirement would decrease. The higher the debt ratio the smaller the defected norm, which could be fulfilled or over-fulfilled with less effort.

In the cases of present value calculation where the yield requirement for the part financed by credit equals the actual interest rate we might witness a unique connection that is, if other conditions remain unchanged we get a higher and higher present value for the same variant of activity. The generated present value surplus through credit increases if the sum of credit is raised.

In the eyes of the management the smaller average capital yield requirement provides, in general, a significantly comfortable position.

### 4. THE SURPLUS OF NPV BY DEBT

The NPV was a frequently used accounting method for managerial decisions in the past, too. It means: the discounted sum of capital yield above the return of nominal value and the yield-requirement. If its value is 0, the investment brings as much yield as is the yield-requirements. Since the yield requirements get covered the investment with 0 PV is still economical.

It could easily be seen by lowering the operating profit requirement on debt we get a higher present value in case of that version where financing was done by debt. If only the interest rate is charged as yield requirement concerning the debt, the average yield requirement on the investment will be smaller than in case of version financed by owners' capital. This explains that – according to the shareholder approach – the higher the debt ratio the higher the investment's net present value (otherwise economical).

### 5. SHAPING THE “SHAREHOLDER APPROACH”

When the shareholder formulates his requirements for profitability assumed by the literature (complying with the information basis suitable for the practice of stock market) he does not accounting for the company's getting into debt as a basic information. Subsequently, he does not take the greater assumption of risk into account, which is generated by the credit. Though – under the same conditions – the shareholder of a more indebted company takes a higher risk.

In my point of view, it would be wise to study how generally accepted the referred “shareholder approach” is as well as what factors drove it to be as such. Wouldn't it be useful to treat the company's getting into debt among the relevant information of stock market, or to treat it according to its role? It is probable that the reality is a bit different from the drill suggested by the literature. The experience of modern developed markets indicates that a significant sum of credit influences by itself the current price of shares.

**Szemléleti kettősség a tőkehozam elvárás felszámításában  
(ismertetés)**

*Az előadás arra az ellentmondásra hívja fel a figyelmet, mely a mikroökonómiai alapokon nyugvó opportunity cost és a „részvényesi szemlélet” szerint értelmezett hozamkövetelmények mögött meghúzódik. A gazdálkodástani irodalom hosszú időn keresztül egységes volt abban a kérdésben, hogy az egyes beruházásokba befektetett pénz időértéke független a tőkestruktúrától. A beruházás-gazdaságossági számításokat nem befolyásolta a tőkestruktúrára vonatkozó döntés.*

orosz

*A részvényesi szemlélet előtérbe kerülésével egyre gyakrabban találkozhatunk olyan gazdaságossági számításokkal, ahol a saját tőkére és a hitelre vonatkozóan eltérő hozamkövetelményeket számítanak fel. A saját tőkére a rizikóprémium elvárást is tartalmazó jövedelmezőségi elvárást (a tőkestruktúrától független rátaként), a hitelre csupán a kamat megtérülését. Tekintettel arra, hogy a termékek verseny piacon realizálható ára nem függ a tőkestruktúrától, az opportunity cost elvén megfogalmazható hozamelvárásnak is függetlennek kell lennie attól.*

*A differenciált hozamelvárás további sajátossága, hogy alkalmazása révén az ugyanazon akcióra számított nettó jelenérték annál nagyobb lesz, minél nagyobb a hitel részaránya (egyéb-ként gazdaságos változatot feltételezve). Tekintettel arra, hogy itt az átlagos tőkehozam-elvárás alacsonyabb a kalkulatív kamatlábnál, a mikrogazdasági közelítés szerint gazdaságtalan akció esetén is adódhat nullánál nagyobb nettó jelenérték.*

német