

INTERPOLAR USE OF RESOURCES

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Abstract

Investing implies achieving particular effects in the future. Those effects can be economic and non-economic. In order for one investment project to be valid, the benefits need to be large in comparison to the necessary one-time and multiple investments. This mostly determines the stability and pace of enterprise's development as well as the development of wider social community.

Key words: investing, investment, consumption, life cycle of the project.

INTRODUCTION

The investment project, which is a managed activity that is defined and limited from the aspect of content, time, resources and conducted in a special organizational form of work, has a special significance for the development strategy of an enterprise. It is characterized by long-term character, the existence of an interval between the investments and effects, connection with making financial decisions, risk and uncertainty. Life cycle of the project implies the interval in which the project is, through a particular number of phase and large number of activities, led to completion of implementation. It begins with a designing phase, which is followed by defining phase and finally, the phase of execution, i.e. implementation.

1. DECISION ON CONSUMPTION AND SAVINGS

Bases of economic theory of choice in the time were set by Irving Fisher within his theory of interest rates in 1930. The role of J. Hirshleifer was fundamental in its further development. The starting point of this theory is rational economic behavior of investment decision maker. Namely, "individual or some other decision maker prefers the current consumption at the expense of the previous. Diverting, i.e. allocating a part of current possibilities for consumption, i.e. investing a

part of accumulation in the future job and consumption is accepted if there is an adequate compensation materialized in the real possible and sufficiently probable growth of future consumption" [3, pp. 197]. Measure of this readiness is a marginal rate of time preference, and indifference curve is used as analytical apparatus.

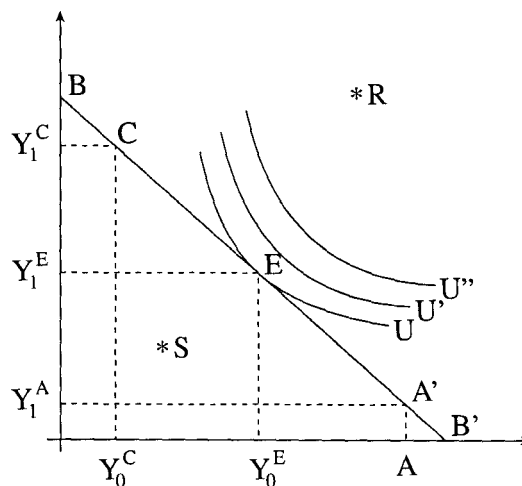


Fig. 1: Intertemporal optimum of consumption
[10, pp. 49]

The essence of intertemporal choice can be shown by the Figure 1. In the above figure, the line BB' represents a set of possible combinations of maximum consumption of today "y₀" and maximum consumption of tomorrow "y₁" and all possible combinations in two periods are shown by the triangle OBB'. This would practically mean that combination

of consumption marked by "S" point is possible but not maximal. Similarly, the combination of consumption marked by "R" point can be desired but it is not possible. Specific entity can choose the combinations of consumption and look for the combination that will be optimal. He can use his possibilities of consumption today in the amount OB, but there will be nothing left for the consumption tomorrow. The reverse situation – leaving the total consumption for tomorrow, in the amount OB', is also possible. Determining the optimal combination of consumption represents determining the point on the line BB", which will reflect the preference of a particular entity as decision maker. In this sense, the analysis also contains a set of indifference curves (U, U', U''), which indicate the different combinations of possibilities of current and future consumption for which the decision maker is indifferent i.e. it is all the same for him which combination on indifference curve he uses. Optimization process requires the comparison between the desired combination of possibilities of consumption expressed by points on the indifference curves of decision makers and the real ones, objectively possible, total consumption possibilities marked by points on the line BB'. From the figure, it can be seen that optimal combination is achieved in the point E as the contact point of indifference curve U and line BB' as a tangent to this curve.

Under the conditions of extreme dispersion of ownership (for example, a corporate form of enterprise) is almost impossible to identify the time preferences of owner/shareholders. Therefore, market interest rate is taken and applied as a satisfactory approximation and a criterion in investment decision making, „as a relatively safe alternative and possibility of placement and fertilization of capital” [3, pp. 198]. Having in mind the Figure 1, the ratio of exchange, starting from the similarity of triangles, can be expressed by the relation

$$EA'/A'A \quad (1)$$

which is, in geometrical sense, equal to the direction coefficient of line BB'. If the price "p₀" is assumed for the possibilities of consumption today "y₀", and the price "p₁" for

the possibilities of consumption tomorrow, the previous relation of the exchange ratio can be expressed by the following relation:

$$-p_0/p_1 \quad (2)$$

If we assume that current consumption possibilities "y₀" are taken as the basis for determining the price – exchange ratio, than p₀ = 1. The direction coefficient of the line BB' will be equal to

$$-1/p_1 \quad (3)$$

and the rate at which current and future consumption possibilities are exchanged is equal to

$$-1/(P_1 - 1) \quad (4)$$

If we omit the negative sign of direction coefficient of the line BB' and mark the annual interest rate (r) as the price of exchange, the same will be equal to

$$r = 1/(p_1 - 1) \quad (5)$$

i.e.

$$p_1 = (1+r)^{-1} \quad (6)$$

by which the price of the unit of possible future consumption is also defined.

C₁, Q₁,

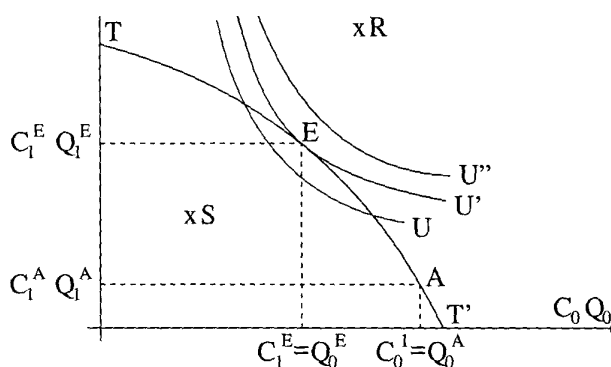


Fig. 2: Intertemporal optimum of production and consumption [10, pp. 49]

In order to adequately explain the intertemporal choice, we need to consider the production and market possibilities and their combining. Production possibilities represent

a set of technologically efficient combination. Graphically, they are represented by a transformation, concave in relation to the starting point, whose slope is $(1 - m)$, where m is the rate of return on investment. In the Figure 2, the transformation curve TT' marks the maximum possible combinations of current and future production (q_0 and q_1), with the assumption of optimal use of available resources. Transformation curve, concave to the starting point, indicates the declining yield

of each unit of today's consumption postponed for the needs of the future consumption. By accepting the transformation curve as an objective constraint and knowing the preferences of entities in the aspect of consumption, represented by a set of indifference curves U, U', U'' , it can be seen that optimal combination of current and future possibilities of production and consumption is achieved in the point E .

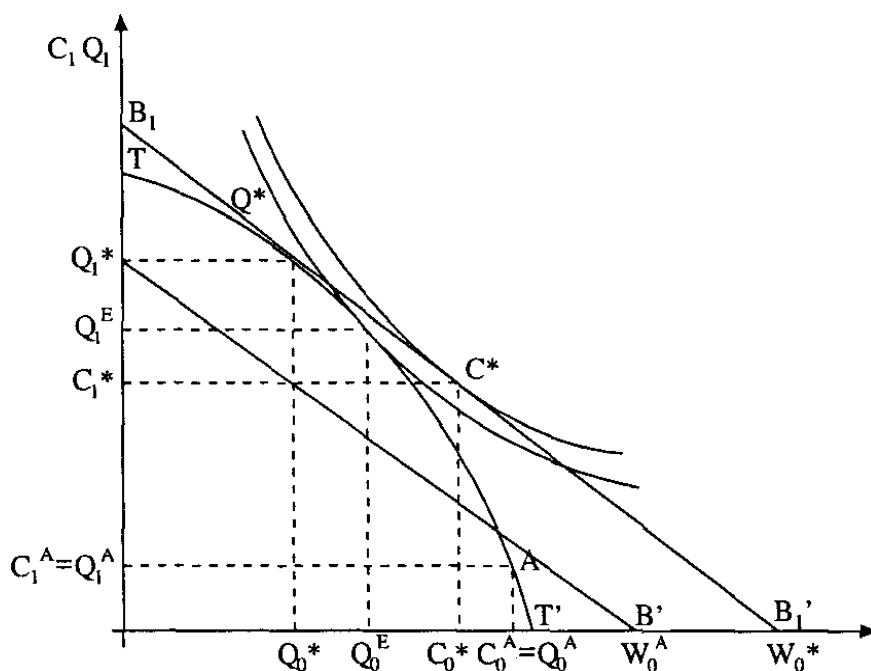


Fig. 3: Intertemporal optimum of production, consumption and exchange [10, pp. 49]

Market possibilities imply the possibility of exchange/transfer of the current and future result through the capital market in the function of desired distribution of consumption over the time. In the Figure 3, the exchange possibilities, which are expressed through ratio of prices, can be represented by a straight line, whose direction coefficient, as it was mentioned, is $-(1+r)$. Each line of the price ratio is linked to the possible combinations of production and the total available possibilities of consumption. Therefore, the line BB' for example, shows the possibilities of market exchange from the initial combination of current and future production and consumption with equally defined total possibilities " W_0^A ". Specific entity has the possibilities to achieve its production optimum climbing to the point

" Q " by various combinations, where the highest price line touches the transformation curve of production. The line of price ratio " B_1B_1 ," corresponds to the maximum of production and consumption possibility, which can be expressed in the following way:

$$W_0^* = q_0^E + q_1^E / (1+r) \quad (7)$$

Having achieved the optimum in the aspect of decision on combination of current and future production, the specific entity can enter into exchanges in accordance with the line of price ratio and search for the optimal combination of current and future consumption for its consumption preferences. Owing to the possibilities of exchange, the consumption optimum is increased and it is marked by the point " C " in the Figure 3.

Simultaneously, the line of price ratio B_1, B_1' has transformed into a real constraint of intertemporal choice of a specific entity as a line of the available income, which needs to be considered when optimizing the consumption, which means that it is:

$$c_0 + c_1 / (1 + r) = W_0^* \quad (8)$$

We can say that a specific economic entity will realize the investments in the amount $q_0^A - q_0^E$, but the same it will self-finance in the amount $c_0^A - c_0^E$. Specific entity will have to provide the missing part for investing $C_0^* - Q_0^E$ from another entity so that he could, in accordance with his preferences, keep the consumption optimum besides the production optimum, simultaneously. Assuming that someone else is willing to give up his consumption possibilities today and with the existence of exchange possibility, both optima can be realized.

In the effort to satisfy both optima, the economic entity should also take care of the time preferences of other entities, i.e. the decisions that are linked to intertemporal distribution of their income. When the savings of one entity-investor is not sufficient for closing the financial structure for a specific project, he is directed to borrow the missing funds, which the other entities have set aside as savings from their income. Borrowing someone else's savings is conditioned by time preferences of the entities who offer the savings to other people for use. Exchange ratio between them is quantified by interest rate, as a measure of intertemporal distribution of financial result. In the economy as a whole, on one side there are those who save and who are willing to offer that savings for use to those who are on the other side and who wish to use that savings for financing their investment projects, so that they could, apart from consumption, achieve the production optimum as well.

Take the loan – borrow the missing funds and invest is rational, while the rate of return on investment is higher than the market interest rate i.e. as long as the rate of return on investment enables the paying of loan price and provides the growth of future consumption. The reality shows that due to:

- transaction costs and
- taxation regime

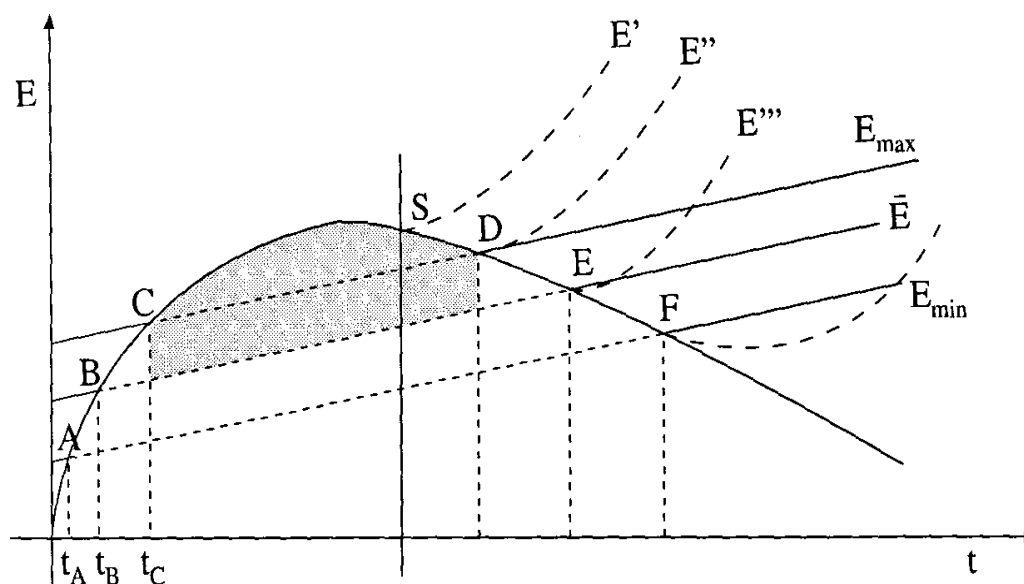
there is no equality of the rates on the taken, but also the given loans in financial market. "The application of the concept of the separation theorem in the practice of investment management implies the use of market interest rate and not the rate of time preference of the shareholders in the company of stock-type. It means that individual shareholder adjusts its intertemporal consumption to different interest rates. Its marginal rate of time preference depends on whether he takes or gives the loan and also on its tax position. In that case, the goal of individual shareholder is that the rate of return on investment after taxation is equal to his rate of time preference. However, that does not mean that investments can be evaluated only by required, really present rate of time preference of enterprise's owner, but by introduction of capital price as investment criterion" [5, pp. 457-458].

2. INTERDEPENDENCE OF LIFE CYCLE OF INVESTMENT PROJECT AND LIFE CYCLE OF THE ENTERPRISE

Observing the life cycle of the enterprise, we see that it encounters the problems that need to be solved by taking the right strategic moves. Entry into the so-called "death spiral", the enterprise can avoid only if it disposes of the portfolio of the project that provides the balance of development from the aspect of the following dimensions [10, pp. 6]:

- Return and risk
- Offensive versus defensive research
- Short-term, medium-term and long-term projects
- Projects of different levels of risk
- Research versus development
- Fundamental versus applied research
- Product versus process
- Particular scientific fields
- Engaging particular project teams
- Projects that are worked on within and out of the enterprise.

efficiency. The rest of critical series consists of the points D, E, F. In the point „D”, we should have the identified development chances on the level of pre-investment study. In the point „E”, we should develop investment study and make investment decision, i.e. practically implement the investment projects. In the point „F”, the enterprise is on the verge of sanation and bankruptcy, so there is no actual freedom for thinking about the development.



Different authors offer numerous classifications of the phases of life cycle of an investment project. Following the logics of investment planning, we believe that it is possible to distinguish three phases of the project's life cycle:

- definition phase, which develops in a few steps – application of the constraints of a higher system, consideration of the project design according to the constraints and alternatives are classified into acceptable and unacceptable etc.

As the parts of particular phases of project's life cycle mutually interlace in time, it means

CONCLUSION

Since the economic processes are, by their nature, complex results of economic analysis of the same, they need to be sufficiently operative, clearly viewed so that the decision on the future investment project could be real,

both in the present and in the future. If the economic entity is not able to complete the financial construction for the particular project, it will borrow the financial funds. Exchange ratio between them is quantified with the interest rate, as a measure of intertemporal distribution of financial result. In the literature, there are many classifications of the life cycle of investment project. The first phase is specific for the fact that all the radical changes within it are real and that we are looking for the optimal solution of project task precisely in it.

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