1Discounting Rate for Nominal and Real Cash Flow in the Assessment of its Current Value

Guli Yarkinovna Mukhibova
Tashkent University of Architecture and Civil Engineering
Associate professor
Department of Economics and Real Estate Management
Yusupjanova Nargiza Utkirovna
Tashkent University of Architecture and Civil Engineering
Associate professor
Department of Economics and Real Estate Management
Odina Ulugbek kizi Sharifkhodjaeva
Tashkent University of Architecture and Civil Engineering
Master's degree student
Department of Economics and Real Estate Management

Abstract: The calculation of the discount rate is a necessary step in assessing the market value of objects of appraisal, as well as the effectiveness of investment projects. The article outlines specific methods for assessing the discount rate when analyzing cash flows and the effectiveness of investment projects in the context of inflation. The relationship between the nominal rate of return used as the discount rate and the effect of inflation on the volume of cash flows is stated. Recommendations are given on the use of nominal and real rates of return in the calculation of cash flows, both in current and in basic prices.

Keywords: Assessment object, investment project, nominal and real rate of return, total (average) level of inflation, discounting of cash flows.

For a reasonable assessment of future cash flows (hereinafter, CF) generated by the appraisal object or from the implementation of an investment project (hereinafter, IP), it is necessary to know the predicted values of investments in the residual value of property, in the capital structure, as well as in the consumed production resources, and as a result - proceeds from the sale of products, profit, wages of employees of the enterprise. In crisis conditions of the economy, a serious problem is the direct calculation of the rate of income (discount rates) for key investment decisions. The economic sense of the discounting procedure lies in the temporal ordering of cash flows from IP, related to different time period in accordance with the requirements of the investor's profitability and which can affect the company's value or capital structure.

Based on these provisions, various models for determining the rate of income are built. The discount rate, which can be nominal and real, is only an intermediate link in the assessment of an IP, which is always subjective: one and same IP may have a different value for his appraisers, since their forecasts are different, their levels of risk perception are different. Today, there are three main calculation methods: using the capital asset pricing model (CAPM), the cumulative construction method and the weighted average cost of capital method (WACC). Each of them has its own advantages and disadvantages. When choosing a specific model, the problem of double accounting for economic risks and the absence of a benchmark for a risk-free rate is especially relevant.

Let us consider specific methods for analyzing the effectiveness of IP in the context of inflation: an increase in the average price level for the necessary material and labor resources. Since the investor intends to receive compensation for the decrease in the purchasing power of money, inflation leads to an increase of percentage in rates for credit resources.

Nominal profit is the company's net profit "at par", i.e. in the usual measurement, taking into account all the expected price changes in the market and does not take into account inflation, risks, or lost profits and, therefore, sometimes provokes heated criticism in economic circles.

_____

Real profit is the nominal profit indexed for inflation and reflects the true purchasing power of an enterpriser individual entrepreneur.

Analysts and business owners most often use the nominal profit measure to assess the success of the enterprise. Nevertheless, the calculation of the real profit is necessary when forecasting the budgets and activities of the enterprise for several years ahead, when it is necessary to index the expected profit for the period to take into account the rise in prices for certain material and technical resources with different inflation rates over the years. In practical terms, this is a difficult task.

The nominal profitability of IP in conditions of inflation should be made up of the real rate of income, the rate of inflation and the real rate of income multiplied by the rate of inflation. The minimum is considered to be such a profit P_{min}, which, after paying taxes, provides the enterprise with a minimum level of profitability P_{min} on the invested capital, equal to the average percentage of banks rate on deposits for the period under study:

$$P_{min} = K \cdot P_{min} / (100 - C_p), \tag{1}$$

where K is the amount of invested capital; C_p - the rate of income tax in accordance with applicable law.

In order to study the movement of CF under inflation conditions, consider the following example:

When assessing the effectiveness of the IP, the investor used the data of the predictive analysis of price changes and it was established that for the period of the IP implementation the average inflation rate consist of $I_{aver} = 8\%$

The investor agrees to sell the IP if the real rate of income is $RI_r = 12,5\%$

The calculation of the nominal rate of income is applied according to the formula:

$$RI_n = (1 + 0,01 \, RI_r) \cdot (1 + 0,01 \, I_{aver}) - 1 \tag{2}$$

where RI_n, RI_r, – espectively, nominal and real rate of income,%; I_{aver} – average inflation rate,%. Given numerical values

$$RI_n = (1 + 0,01 \cdot 12,5) \cdot (1 + 0,01 \cdot 8) - 1 = 1,125 \cdot 1,08 - 1 = 0,215.$$
$$Or \ RI_n = 21,5\%$$

The relationship between the real and nominal rate of income is expressed by the formula
$$RI_r = (1 + RI_n) / (1 + I_{aver}) - 1 = (1 + 0,215) / (1 + 0,08) - 1 = 0,151.$$
$$Or \ RI_r = 15,1\%$$

It follows from this example that, in the case of using the nominal rate of income as the discount rate, the inflation factor increases the volume of cash income and expenses. Thus, if the nominal rate of income is used to assess the efficiency of IP, then the calculation of the CF should be carried out in current (actual) prices, and not in basic prices, since inflation is de facto taken into account in prices. If, when calculating the efficiency of IP, one proceeds from the basic (unchanged) prices, then the CF should be discounted at the real rate of income.

To illustrate the above points, consider the following example.

Example.   Calculate the net present value (NPV) of the IP sale based on the following conditions: expected annual income from the IP sale 50,000; 55,000; 57,000; 59,000 c.u. respectively in the 1st, 2nd, 3rd and 4th years; IP life - 4 years; required real rate of income - 12%; the average price growth rate is 8.5%. The calculation of the annual cash income using nominal and real rates of income.

Method	Years	1	2	3	4
I	Annual income at basic prices c.u.	50 000	55 000	57 000	59 000
	Average price increase	**8,50%**			
	Annual income at current prices c.u.	54 250	59 675	61 845	64 015
	Required real rate of income	**12,00%**			
	Nominal rate of income	**21,52%**			

_____

	NPV at nominal rate of income c.u.	44 642,86	49 107,14	50 892,86	52 678,57
	The amount of VPN c.u.	**197 321,43**			
II	Annual income at current prices c.u..	50 000	55 000	57 000	59 000
	NPV at nominal rate of income c.u..	44 642,86	49 107,14	50 892,86	52 678,57
	The amount of VPN c.u.	**197 321,43**			

The main feature of investing in real assets is investing funds today for the sake of obtaining a profit in the future, and the life of such investments is usually more than a year. Hence - the non-simultaneity of the implementation of costs and income, and the larger this gap, the more IP is exposed to inflationary processes In the official data, which are published in the open press, most often, the value of the average or general inflation rate for the reporting period is given on the assumption that the growth rates of prices for all types of material and labor resources used in the implementation of IP change on average by the same percentage. Taking this into account, this indicator is convenient for calculating the efficiency of IP as a research tool on the base of forecast prices using price change indices differentiated by groups of material, fuel and energy resources, goods, works and services The disadvantages of this method is the need for differentiated accounting of inflation rates due to the difficulty of obtaining information on the forecast dynamics of price changes in the context of all types of material, technical and labor resources consumed in the process of the production and sale of products, since the growth rates of prices for separate resources are not the same.

Therefore, when making an updated assessment of the effectiveness of an individual entrepreneur, as well as when drawing up business plans, it is necessary to take into account the dynamics:

1) the average price level (general inflation);
2) prices for used raw materials, materials, components, fuel and energy resources;
3) growth of wages;
4) the cost of fixed assets involved in production;
5) the value of intangible assets;
6) bank interest rates;
7) the costs of organizing the sale of products.

However, it must be borne in mind that the most complete picture can be obtained only when the calculation is made both in the basic and in the current ones, i.e. in forecast prices [2, 3]. At the same time, the flow of real money (inflows and outflows) for calculating the commercial efficiency of an individual entrepreneur, as well as for analyzing its impact on the efficiency of an enterprise's economic activity, should be produced in forecast (current) prices. The calculation of discounted IP performance indicators should be carried out at basic or estimated prices.

Thus, to assess the efficiency of IP, basic, world, forecast and calculated prices can be used [4].

Determination of the economic efficiency of the IP, at base prices unchanged for the entire period, is carried out at the stage preceding the adoption of a managerial decision on the feasibility of its implementation. At the stage of feasibility study (FS) of the IP efficiency, the calculation of the efficiency is carried out both in basic and in forecast prices.

It is advisable to bring the estimated prices to the moment when the main investments are made, and the project begins to generate positive income [4]. Basic, forecast and calculated prices can be expressed in national currency or in US $ [1, 2].

The decision on the feasibility of introducing IP can be made on the basis of both real and nominal efficiency. However, if the future income and expenses of the enterprise are long-term, then they should be calculated in forecast prices. Moreover, a more accurate result will be obtained when not the average price change is taken into account, i.e. not the general level of inflation, but data on specific changes in prices for products and types of resources used in their production.

_____

Conclusions

Based on the foregoing, it can be concluded that a specialist who calculates the assessment of the cost of future CF or the effectiveness of IP and evaluates its impact on the efficiency of the enterprise must carefully study all possible consequences of inflation, and also take into account the long-term trends in price changes for goods (services) produced by the enterprise and on the key types of resources consumed in the production of products.

References:
1. Berens V., Havranek P.M. Investment Performance Evaluation Guide, M., AOST "Interexport," Infra-M, "1995
2. Zolotogorov V.G. Investment Design: Manual, M., 2006
3. Kovalev V. V. Methods of Evaluation of Investment Projects: Moscow, Finance and Statistics, 1998
4. Mazur I.I. Project Management: M., OMEGA-L, 2004.
5. Muxibova G.Ya., Ziyaev M.K., Sharifkhodjaeva O.U., Yusupdjanova N.U., Priority directions of small business development in the construction complex of the republic of Uzbekistan. 2023. https://dx.doi.org/10.15863/TAS