INVESTMENT PROJECTS IN FUNCTION OF DEVELOPMENT IN AGRIBUSINESS WITH SPECIAL ATTENTION TO NOT DISCOUNT INVESTMENT CRITERIA

Marijan Stevanovski†, Dijana Jovanoska‡

†Faculty of Management, MIT University Skopje, Treta Makedonska Brigada bb, 1000 Skopje, Republic of Macedonia
‡PHI Centre for Public Health Tetovo, 29 November 73, 1200 Tetovo, Macedonia

e-mail: marijan.stevanovski@gmail.com

Abstract

Investments play a significant role and function in the development of the companies because they lead to an increase in capital stock. Each project begins with the grip frame, which defines the basic elements as crucial elements that appear in the project. That is the case with investment projects in agriculture. These investments according to the project framework contain not only a financial dimension, but also a time dimension. Every investor asks pragmatic question: “During which time should I expect the return of the invested funds through proceeds expected from the project in agribusiness?” In order to answer this question our aim was not simply to use various methods containing various criteria linked to the appropriate method of calculation which is the main content of the paper. The aim of our work is to perform properly define: the project framework, the algorithm of the financial activities in accordance with the project framework and the manner of implementation of the project.

The paper uses two methods for applying no discount investment criteria as follows: period of return on investment and return on investment. The first method, the period of return on investment, contains calculation approaches such as: the static approach, calculating the period of return on investments through cumulative net flows, calculating the period of return on investment through savings in cost and calculating the period of return on investment through discounted flow of net inflows. The second method, rate of return on investments includes approaches such as: calculating the rate of return based on the initial investment, and accounting rate of profitability.

Immediate access was necessary through analysis which show strengths and weaknesses and their correlation with the immediate development of agribusiness. The methods of calculation have a great simplicity and convenience and therefore are often used by managers when making financial decisions. This calculation method should be taken as indicative of the size of profitability. The criteria for the calculation are limited so managers can exclusively use only these two criteria.

Key words: Investment, Return, Yield, Project framework defined purpose, Cost criteria.

1. Introduction

The investment project is a business venture being undertaken in order to achieve predefined goals for a certain time with certain costs. Investment projects are consisted of three main phases [2]:
• Project framework.
• Movement of activity according to the project framework.
• Concrete project implementation.

Each investment project has its general characteristics such as [3]:
• It takes place in the future.
• It has limited time (one-time, unique and unrepeatably venture).
• It is targeted towards defined objectives.
• It hires: resources, costs, time and resources.
• It requires coordination of activities.
• It takes elements of risk.
• It is realized if it is justified for implementation.

Investment in general, including investment in agriculture, according to the project framework, contains not
only a financial dimension, but also a time dimension: “During which time should I expect the return of the invested funds through proceeds expected from the project in agribusiness?”

In order to answer this question we use various methods that include criteria related to appropriate ways of calculation.

Most of the criteria are not based on the temporal dimension of the value of money: [5]
- The period of return on investment and
- The rate of return on investment.

These two principles are also called “not easy investment criteria” because its calculation does not actualize the expected returns on investment of the project. Different calculation is expressed through various approaches that are closer to the base in response to the following questions: What is taken as an input? Which aspects of the monitoring give an assessment of project performance?

The calculation of the criterion of period of return on investment is based on the concept of financial contributions or cash flow of the project and the rate of return on the balance concept, the net profit after tax.

The aim of our work is to perform properly define: the project framework, the algorithm of the financial activities in accordance with the project framework and the manner of implementation of the project.

2. Materials and Methods

2.1 Period of return on investment

Investing is a long term activity which is calculated in years. Simplification of this method is the number of years to recover the investment. Estimated time of return based on expected period that the management team designed a criterion for acceptance or rejection of the project. According to this methodology it starts from the investment logic: if the period of return on investment is less, invested capital returns faster, liquidity comes quicker and, therefore, the time to reinvest back is shorter [1].

Starting from the logical point of view it is further deepened with new thinking: comparison between more investment projects, investment alternatives or variants of a project, keeping the same proportion to other conditions, asset conversion project would receive the shortest period of return on investment [1].

The process of decision making starts from the definition of normal repayment period. This period is defined as: the longest period of return on investment.

In this acceptable and applied method of calculation, several approaches are taken that are characteristic of the calculation as follows:
- Static-access based on the projected net inflow
- Dynamic approach - based on the projected cumulative flow of net inflows in the economic century
- Dynamic Discount approach - based on the cumulative discounted flow of net inflows

2.2 Statistical approach

Statistical approach to calculate the period of return on investment includes two quantities [2]:
- The total amount of the initial investment in fixed capital and net working capital and
- The projected net cash flow that would occur in normal representative year.

For a representative year we can take the first year of operating period during which is expected normal use of the capacity. For this year to be considered as normal, it is necessary to take into account the initial obligations that represent debt for financing the project, the Figure 2.

Conclusion:

When comparing investment projects, with equal conditions, preference for realization would receive the project with shortest period of return on investment.

Figure 1. Characteristics of investment
The basic calculation method is done through the following formula [1]:

\[ T = \frac{\text{Initial investments}}{\text{Net inflow}} \]

Although the calculation is quite simple it has additional weaknesses. These weaknesses are interpreted by uncertainty in choosing a representative year. In order to overcome this weakness we use developed form of calculation.

\[
\text{Period of return} = \frac{\text{Initial investments}}{\text{Average annual net cash flow}}
\]

This way of calculation is an improved variant of the previous but still has a weakness: in high variability of projected net inflows receive different values.

### 2.3 Calculation of the period of return on investment through cumulative net inflows

The calculation starts from the basic projected net cash flow of the project throughout the economic century. Repayment period is the period which would be aligned with the amount of investment accumulative of net cash flow.

Cash flow is used as the basis for calculating the period of return on investment.

The calculation is carried out with the following formulation [1]:

\[
I = \sum_{j=1}^{n} NP \quad \text{or} \quad \sum_{k=1}^{l} NP = \frac{1}{I}
\]

Where:
- \( I \) = amount of investment
- \( NP \) = net cash inflow

In case the investment period is longer than one year the period of return is calculated according to the model [1]:

\[
\sum_{j=0}^{m} I = \sum_{k=1}^{l} NP
\]

Where:
- \( I \) = the investment period (j = 1 to m).
- \( k \) = the length of the operating period (k = 1-n) a year in which flattens cumulative net investment amount of investment.

### 2.4 Calculation of the period of return on investment through savings in the cost

This calculation method is commonly used in cases where we have a process of modernization and introduction of new technology. The introduction of a new technology enables the process to reduce the cost of operations.

\[ T = \frac{I}{Z} \]

Where:
- \( T \) = costs.
- \( I \) = investments.
- \( Z \) = annual amount of savings.

Strengths of this way of calculation are as follows [5]:
- This method of calculation is useful for small projects
- It is used for limited investment funds that are determined by company policy,
- It is used for projects that are at large risk,
- The technique is simple and can be used by anyone with little knowledge of accounting techniques.

This calculation method has its weaknesses which are expressed through:
- Accepting investment by the investor in a shorter period of return.
- Neglecting the net inflows that is projected in the area of economic life following the period of return on investment.
- Project selection becomes uncertain in projects with different economic life.
- Ignoring the time preference of net cash inflows,
- Neglecting of re-investment.

Due to its nature of calculation, criteria for repayment period cannot withstand competition criteria for net present value and internal rate of profitability that is based on time preferences net inflows.

### 2.5 Period of return calculated by discounted flow of net inflows

The biggest weakness of the period of return on investment is the absence of time that prefers net inflows of projected cash flow of the project.
Elimination of the defect was made using the discount period of return on investment with the inclusion of risk in investment decision.

2.6 Return on investment

According to the logic of investment, the investor includes certain amount of financial capital and expects greater returns in the future. There is a quantitative relationship between investment and return. Here the investor asks the following question: What is the relative contribution ratio between contributions and investments?

First it assessed the cost-effectiveness of the investment project, by formulation [3]:

$$ RR = \frac{\text{Projected annual amount of profit}}{\text{Investments}} $$

As mentioned before the rate of return is a ratio between yield and investment. An offering is taken net profit after taxation.

There are two approaches as follows:

- Investments are seen as an initial amount
- Investments are taken as an average size

In practice there are several versions of calculation as follows:[1]

- Calculation based on the initial value
- Calculation based on the average accounting value,
- Calculation based on average investment base and
- Calculation based on overall profit

Weaknesses of the average rate of return:

- Calculation of the average rate of return is based on net profit as accounting category and not on net cash flow.
- It is not taken into account the time value of money or the opportunity for reinvestment.
- There are different variability of net proceeds when comparing one to another project.
- It is necessary to use other mathematical methods such as standard deviation in order to perform further analysis with greater accuracy.
- Not taken into account the length of the economic life of the project.

3. Results and Discussion

According to the Farm Structure Survey data, there are 170,885 agricultural holdings in the Republic of Macedonia. On average, one agricultural holding uses 1.85 ha of agricultural area and breeds 2.14 LSU (livestock size units).

The total utilized agricultural area by agricultural holdings is 315,863 ha, and of the total number of holdings, 58.2% used up to 1 ha of agricultural area. The share of arable land and gardens is 75% of the total utilized agricultural area.

Agricultural holdings have a total of 365,868 LSU, while 56.5% of the total number of holdings breed livestock, poultry or beehives. The agricultural holdings have 239,362 head of cattle, 734,472 head of sheep and 96,281 head of goats.

In the Republic of Macedonia, on average, there are 0.5 tractors per agricultural holding, of which the majority are two-axle tractors. The agricultural holdings own 92,708 tractors and 1,797 combine harvesters.

During the period from 01.06.2012 to 31.05.2013, a total of 441,742 persons contributed one or more days of labor at the individual agricultural holdings and were employed in business entities. On average, 2.6 persons are engaged per agricultural holding.

Engaged persons worked a total of 243,689 annual work units (AWU), while 1.43 AWU worked on average per agricultural holding. One agricultural holding worked 0.77 AWU on average per hectare of utilized agricultural area, while 0.67 AWU were used per 1 LSU. Around 55% of the individual agricultural holdings use more than half of their production for own consumption [4].

<table>
<thead>
<tr>
<th>Table 1. Main indicators [4]</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameters</td>
<td>Republic of Macedonia</td>
</tr>
<tr>
<td>Number of agricultural holdings</td>
<td>170,885</td>
</tr>
<tr>
<td>Total utilized land, ha</td>
<td>315,863</td>
</tr>
<tr>
<td>Livestock units</td>
<td>365,868</td>
</tr>
<tr>
<td>Number of tractors</td>
<td>92,708</td>
</tr>
<tr>
<td>Household members engaged at individual agricultural holdings and employees at business entities</td>
<td>441,742</td>
</tr>
<tr>
<td>AWU-Total</td>
<td>243,689</td>
</tr>
</tbody>
</table>

| Table 2. Gross fixed capital formation - machinery and equipment (in million euros) |  |  |  |
| Type of machinery and equipment | 2010 | 2011 | 2012 |  |
| Total | 488 | 522 | 528 |  |
| Agricultural machinery | 16 | 13 | 18 |  |
Table 3. Gross fixed capital formation by purpose of investment and type of ownership, 2012 (in million euros)

<table>
<thead>
<tr>
<th>NKD sector Name</th>
<th>Type of ownership</th>
<th>Total</th>
<th>State</th>
<th>Private</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>1.773</td>
<td>494</td>
<td>1.276</td>
<td>3</td>
</tr>
<tr>
<td>Agriculture, Forestry and Fishing</td>
<td></td>
<td>36</td>
<td>1</td>
<td>35</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Table 4. Gross fixed capital formation by purpose of investment (in million euros)

<table>
<thead>
<tr>
<th>NKD Rev. 2 sector Purpose of investment</th>
<th>Year 2010</th>
<th>Year 2011</th>
<th>Year 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.639</td>
<td>1.775</td>
<td>1.773</td>
</tr>
<tr>
<td>Agriculture, Forestry and Fishing</td>
<td>39</td>
<td>34</td>
<td>34</td>
</tr>
</tbody>
</table>

Table 5. Gross fixed capital formation by purpose of investment and type of ownership, 2013 in million euros

<table>
<thead>
<tr>
<th>NKD sector Name</th>
<th>Type of ownership</th>
<th>Total</th>
<th>State</th>
<th>Private</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>1.908</td>
<td>478</td>
<td>1.425</td>
<td>5</td>
</tr>
<tr>
<td>Agriculture, Forestry and Fishing</td>
<td></td>
<td>52</td>
<td>1.5</td>
<td>51</td>
<td>0.09</td>
</tr>
</tbody>
</table>

According to the State Statistical Office data, the total value of GFCF in the Republic of Macedonia for 2013 was 1.908 million euros. The nominal increase in the value of gross fixed capital formation for 2013, in comparison with 2012, was 7.6%. In the technical structure of GFCF construction participated with 62.4%, machinery and equipment with 31.5%, and the rest of GFCF with 6.1%.

The highest amount of GFCF was realized in: F - Construction (32.4%); B, C, D and E - Mining and quarrying, Manufacturing, Electricity, gas, steam and air conditioning supply; Water supply, sewerage, waste management and remediation activities (25.8%) and G, H and I - Wholesale and retail trade, repair of motor vehicles and motorcycles, Transportation and storage and Accommodation and food service activities (13.9%).

According to the data of the State Statistical Office, the price index for Input 1 (goods currently consumed in agriculture) was 106.6, and the price index for Input 2 (investment in agriculture) was 100.0. In June 2013, compared with June 2012, the price index of Crop production was 121.9, and the price index of Livestock production was 104.1.

4. Conclusions

- This calculation method is indicative of the size criterion of cost-effectiveness but not selective criterion. The calculation criteria are limited in their complexes, so managers cannot be based exclusively on these two criteria.
- As a basis for calculation in terms of not discount, these calculating methods have its own application, according to the simplicity of calculation. Therefore, their practicality cannot be excluded. However, during the real decision making other financial methods that directly involve the section on investments should be also used.

5. References