Abstract: Non-reimbursable financing for investment projects is a high interest subject in the post-adheration phase of our country to European Union. This new way to finance projects implies new methods and techniques for financial forecasting that take into account these new challenges. The following paper present a coherent methodology that can be used in order to justify the necessity and opportunity for non-reimbursable financing for investment projects, taking into account the specific requirements of the existing financing programs available for Romanian investors.

Key-Words: Cash-flow forecasting, Net present value, Internal rate of return, Non-reimbursable financing

1 Introduction
In 2007 Romania joined the European Union (EU) and, as a direct consequence, started to benefit from non-reimbursable funding in order to reduce the gap in economic and social development to the other countries in the EU. These financing opportunities are directed towards investment projects, social development projects and public services projects.

Accessing the non-reimbursable financing opportunities implies a competitive selection for the financing requests sent by applicants to the financing authorities. The financing requests are accompanied by technical and financial documents of different complexity degrees, documents that are meant to justify the request for financing.

Investment projects are a large part of the projects proposed for financing by applicants. These investment project proposals submitted to the financing authorities have to prove that the non-reimbursable funding is necessary and appropriate, justification that is made by using financial
forecasting of the cash-flows generated by the proposed projects.

In order to prove that an investment project submitted for financing is both necessary and financially viable, the applicant has to forecast the projects cash-flow and calculate certain indicators. The most often used indicators are the Net Present Value (NPV) and the Internal Rate of Return (IRR), both of them being well known financial indicators, but when used for projects with non-reimbursable funding they have to be adjusted in order to provide the necessary information regarding the proposed project.

The low rate of funds absorption registered by Romania at the end of 2010 and the lack of abilities both in providing and checking the financial aspects of the projects demonstrate that the problem of forecasting the cash-flows of investments with non-reimbursable funds is not yet solved.

2 Problem Formulation

For an investment project that is submitted in a call for projects for non-reimbursable financing, the applicants have to forecast the cash-flows in order to determine the necessary financial indicators, NPV and IRR.

In order to analyze an investment project one has to establish certain assumptions made:
- the investment project is deployed over a prior time period, named “forecasting period”;
- the forecasting period is divided into two distinct time periods: the implementation period (the project is implemented in this time period) and the operating period (start when the project is finalized and the project starts functioning and producing incomes);
- for the implementation period the cash-flows should be presented monthly, and for the operating period the cash-flows should be presented yearly.

The 7th International Accounting Standard (IAS 7) defines the cash-flows as cash and cash equivalent receipts and payments. The financial statements users are provided with a useful tool for evaluating a company’s ability to generate cash and cash equivalents, and its requirements for using cash and cash equivalents in current activities.

The standard proposes three types of cash-flows:
- Investing cash-flows – the acquisition and disposal of long-term assets and other investments that are not considered to be cash equivalents;
- Operating cash-flows – activities that alter the equity capital and borrowing structure of the entity;
- Financing cash-flows – activities that alter the source of funds and alter the financial leverage of the entity.

Using the net cash-flows of every forecasted period, one can calculate the Net Present Value using the following relation:

\[ NPV = \sum_{i=1}^{n} \frac{CF_i}{(1 + r)^i} \]  

where,
- \( r \) – the discount rate
- \( CF_i \) – net cash-flow generated in period \( i \).
Analyzing the value calculated for the Net Present Value, a decision-maker should decide to implement/finance the project if \( NPV > 0 \).

The other indicator, the Internal Rate of Return can be calculated as the value for the discount rate that makes \( NPV = 0 \). The decision-maker should decide to implement/finance the project if \( IRR > r \).

The presented cash-flows and indicators calculated based on those cash-flows can be employed by a economic entity in order to determine if an investment project is worth doing or not.

The specific problem addressed in this paper is regarding those investment projects that are submitted for non-reimbursable funding. The applicants that submit this projects have to prove the necessity and opportunity of the proposed investment projects.

Forecasting the cash-flows and calculating the financial indicators for those projects requires adapting the presented methodology to the specifics of non-reimbursable funding.

### 3 Problem Solution

Forecasting cash-flows for investment projects with non-reimbursable funding requires using a specific structure in order to appreciate the necessity and opportunity of the proposed investments.

In order to evaluate a proposed investment project, one has to forecast two separate cash-flows that integrate different elements for the three cash-flow types identified using the functional approach.

**Evaluating the necessity for the non-reimbursable financing** requires using the following cash-flow structure:

**A. Investing cash-flows**
- contains the investment value minus the VAT (Value Added Tax), distributed over the implementation period

**B. Financing cash-flows**
- doesn’t contain the financing sources for the project (ex: non-reimbursable financing, the state budget, attracted financing sources, the applicant own financing sources)
- doesn’t contain the cash payments afferent to the attracted financing sources (rates and interests)

**C. Operating cash-flows**
- contains the operating cash receipts and payments excluding the VAT
- the residual value is included in the last forecasting period

**D. Net cash-flow of the period (A+B+C)**

**E. Available from the previous period**

**F. Cumulative cash-flow (D+E)**

Using this structure for the forecasted cash-flows, by adding the different cash-flows considered, the following relation can be used for the Net Present Value at Investment Costs:

\[
NPV(C) = \sum_{i=1}^{n} \frac{I_i}{(1+r)^i} + \sum_{j=1}^{m} \frac{CF_j}{(1+r)^j} + \frac{RV_n}{(1+r)^n}
\]

where,
- \( i \in \{1, ..., n\} \) – the implementation period
- \( j \in \{n+1, ..., m\} \) – the operating period
- \( r \) – the discount rate
- \( I_i \) – the investment cost in period \( i \)
- \( CF_j \) – cash-flows generated in period \( j \)
- \( RV_n \) – residual value.

The evaluation of the necessity of the non-reimbursable financing is done based on the following conclusions:
- the Net Present Value at Investment Costs has to be negative (\( NPV(C) < 0 \));
- the Internal Rate of Return at Investment Costs has to be smaller then the employed rate of discount (\( IRR(C) < r \)).

If the two results presented are obtained, the proposed project should not be implemented in the proposed financing alternative (financing entirely done by the applicant). In this case, the project is not financially viable; implicitly it does need the non-reimbursable financing.

Once the necessity of the non-reimbursable financing is established, the opportunity for the non-reimbursable financing has to be evaluated.

Using certain assumptions given by the financing program considered, like the intensity of the non-reimbursable funding (ex: 1 mil. Euro or 50% of the investment costs), the cash-flows are constructed as follows:

**A. Investing cash-flows**
- doesn’t contain the investment value

**B. Financing cash-flows**
- contains the financing sources of the applicant for the project (ex: attracted financing sources, the applicant own financing sources)
- contains the cash payments afferent to the attracted financing sources (rates and interests)

**C. Operating cash-flows**
- contains the operating cash receipts and payments excluding the VAT
- the residual value is included in the last forecasting period

**D. Net cash-flow of the period (A+B+C)**
E. Available from the previous period

F. Cumulative cash-flow (D+E)

Using this method for building the forecasted cash-flows, we can use the following relation to calculate the financial indicators:

\[
NPV(K) = \sum_{i=1}^{n} \frac{K_i}{(1+r)^i} + \sum_{j=n+1}^{m} \frac{CF_j}{(1+r)^i} + RV_m
\]

(3)

where,
- \(i \in \{1, \ldots, n\}\) – the implementation period
- \(j \in \{n+1, \ldots, m\}\) – the operating period
- \(r\) – the discount rate
- \(K_i\) – the applicants resources in period \(i\)
- \(CF_j\) – cash-flows generated in period \(j\)
- \(RV_m\) – the residual value.

The evaluation of the opportunity of the non-reimbursable financing is done based on the following conclusions:
- the Net Present Value at Invested Capital has to be negative (\(NPV(K) < 0\));
- the Internal Rate of Return at Invested Capital has to be smaller than the employed rate of discount (\(IRR(K) < r\)).

3.1 Numeric example

Using the methodology presented, we will evaluate an investment project starting from the following assumptions:
- total investment costs, not including VAT: 2.000;
- implementation period: 2 years;
- annual operating cash-flow: 700;
- operating period: 3 years;
- discount rate: 5%;
- financing intensity: 50%;
- applicants sources: 100% own funds.

Using these assumptions we build the forecasted cash-flows in order to evaluate the necessity of the non-reimbursable financing:

Using the same assumptions we build the forecasted cash-flows in order to evaluate the opportunity of the non-reimbursable financing:

4 Conclusion

The two cash-flows presented allow an applicant or a financing authority to evaluate the necessity and opportunity for non-reimbursable financing for an investment project. These evaluation methods are presently used for evaluating project for non-reimbursable financing in Romania, without any existing accepted methods for structuring and constructing the forecasted cash-flows.

This paper proposes a coherent methodology for using forecasted cash-flows in order to evaluate investment projects with non-reimbursable financing.

\[\text{Table 4}\]

<table>
<thead>
<tr>
<th>Cash-Flows</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Investing cash-flows</td>
<td>-1,000</td>
<td>-1,000</td>
<td>700</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>B. Financing cash-flows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Operating cash-flows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Net CF (A+B+C)</td>
<td>-1,000</td>
<td>-1,000</td>
<td>700</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>E. Available previous period</td>
<td>-1,000</td>
<td>-2,000</td>
<td>-1,200</td>
<td>-600</td>
<td></td>
</tr>
<tr>
<td>F. Cumulative CF (D+E)</td>
<td>-1,000</td>
<td>-2,000</td>
<td>-1,300</td>
<td>-600</td>
<td>100</td>
</tr>
<tr>
<td>(\text{NPV}(C))</td>
<td>-130.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{IRR}(K))</td>
<td>1.97%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The calculated \(\text{NPV}(C)\) is negative and the \(\text{IRR}(K)\) is smaller than the discount rate, so we can conclude that the proposed project requires non-reimbursable financing.

\[\text{Table 5}\]

<table>
<thead>
<tr>
<th>Cash-Flows</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Investing cash-flows</td>
<td>-500</td>
<td>-500</td>
<td>700</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>B. Financing cash-flows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Operating cash-flows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Net CF (A+B+C)</td>
<td>-500</td>
<td>-500</td>
<td>700</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>E. Available previous period</td>
<td>-500</td>
<td>-1,000</td>
<td>-300</td>
<td>400</td>
<td>1,100</td>
</tr>
<tr>
<td>F. Cumulative CF (D+E)</td>
<td>-500</td>
<td>-1,000</td>
<td>-300</td>
<td>400</td>
<td>1,100</td>
</tr>
<tr>
<td>(\text{NPV}(K))</td>
<td>799.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{IRR}(K))</td>
<td>35.58%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The calculated \(\text{NPV}(K)\) is positive and the \(\text{IRR}(K)\) is larger than the discount rate, so we can conclude that the proposed project should be awarded non-reimbursable financing.

In conclusion, the proposed investment project requires and should benefit from non-reimbursable financing from the financing program.

Aknowledgement

This work was supported by CNCSIS-UEFISCSU, project number PNII-IDEI_1805/2008.

References:
[2] *** – International Accounting Standard nr. 7;