EVALUATION OF INVESTMENT PROJECTS IN CASE OF CONFLICT BETWEEN THE INTERNAL RATE OF RETURN AND THE NET PRESENT VALUE METHODS

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Abstract. *Results obtained by employing the net present value (NPV) and the internal rate of return (IRR) methods allow to objectively determine the effectiveness and attractiveness of an investment project and to compare investment projects differing in scope, length or the amount of expected profit. While results obtained by the NPV and IRR methods normally correlate, contradictions are possible in individual cases. Such contradictions are called 'conflict between the IRR and NPV methods'. The paper deals with the main characteristics of NPV and IRR, analysing the substance of the conflict and cases of its manifestation. A technique for the resolution of the NPV and IRR conflict is proposed.*

Key words: *net present value, internal rate of return, conflict of the IRR and NPV methods, evaluation of investment projects*

Introduction

The methods of net present value (NPV) and of internal rate of return (IRR) are among the ones most frequently employed in the evaluation of investment projects based on discounted cash flows. According to studies by different authors, the prevalence of these methods in practice varies from 70 to 100%. The methods have a universal character, strong methodological basis and broad application in the areas of both investment project evaluation and other areas such as business value or financial investments analyses.

Somewhere, the degree of reliability of the methods is equal; therefore, sometimes only one of them is used, with the decision adopted on the basis of a single indicator. Normally, priority is given to the IRR method which is more understandable and obvious to investors as an indicator demonstrating the limit profitability of the project. In most cases, the results of both NPV and IRR analyses are the same; however, conclusions

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may differ in case of evaluation of non-typical investment projects. A situation where the project evaluation indicators produce opposite results is called a conflict of the IRR and NPV methods.

While the problem has been investigated by many foreign researchers (Ehrhardt, Brigham (2002); Brealey, Mayers, Marcus (2001); Correia, Flynn, Uliana, Wormald (2008); Dayananda (2002); Galasyuk (1999); Blank (2000), etc.), one may state that it has not been studied sufficiently as yet. In particular, this is seen in tasks of practical nature the solution of which requires a consistent methodology of evaluation. In works of Lithuanian authors (Rutkauskas, 2006; Ginevičius et al., 2009; Cibulskienė, Butkus, 2007), investigation into these problems is insufficient, with only certain aspects covered.

The purpose of the study was to develop a technique enabling objective decisions under the conflict of results obtained through employment of the net present value (NPV) and of internal rate of return (IRR) methods.

The study methods: general methods of analysis of scientific literature, expert evaluation, and analysis and synthesis of financial and economic indicators. The working out of the technique is also based on the methods of modeling of business processes, business value, capital costs, etc.

1. Key characteristics of the net present value method and the internal rate of return method

A good understanding of the methodological basis is required in order to understand the essence of the NPV and IRR conflict. These methods are based on cash flows of a project, which are determined as the difference between incoming and outgoing cash flows in each year of the project's implementation. Therefore, there have been attempts by some authors (Jacobs, 2007) to joint the methods into a single NPV-IRR method to be used in project evaluations. Although the value of the applicable discount rate is additionally required for the determination of the NPV value while net cash flows of a project are sufficient for the calculation of IRR, these indicators are closely interrelated. The results obtained on the basis of these indicators include the absolute NPV value showing the present value of the project's cash flows, expressed in certain monetary units, and a relative IRR indicator describing the internal rate of return of the project under consideration (Damodaran, 2002; Boer, 1999; McLaney, 2006; Teplova, 2008; Ehrhardt, Brigham, 2002, etc.). Miller and Park (2004) assert that the prevalence of the methods among financial analysts and methods surveyed is 70 to 80%.

Thus, the NPV method is based on the concept of the net present value and shows the amount by which the aggregate income of the project exceeds the aggregate payments thereunder. The simplest formula for the NPV calculation is as follows (McLaney, 2006; Hitchner, 2006):

$$NPV = \sum_{t=0}^{T} \frac{CF(t)}{(1+d)^t}, \tag{1}$$

where CF (t) is the cash flow in period *t, d* is the discount rate, and *T* is the life of the investment project.

Thus, NPV of an investment project (or any other investment) is equal to the aggregate cash flow for each period *t,* discounted at the rate (1 + *d*) *t* (Boer, 1999).

Net present value is measured in monetary terms and shows the absolute effectiveness of the project at a given discount rate. An investment project is accepted or rejected depending on its NPV. The following criteria for determining the effectiveness of investment projects based on NPV can be identified:

- where NPV > 0 – the investment project is considered effective at the discount rate *d*, i. e. the value of a business will increase upon implementing the project;
- where NPV < 0 – the investment project is not effective and the investor will suffer losses the amount of which will be equal to the NPV;
- where NPV = 0 – the project will not generate profit but will not be loss-making, either (Vilenski, Levshic et al. 2002; McLaney, 2006: Teplova, 2008; Ehrhardt, Brigham, 2002).

The situation whene NPV = 0 requires an additional interpretation. Such investment project produces a zero effect; therefore, undertaking such a project is rarely proposed in practice. The main reason is the investor's opinion that the project could become loss-making if even slightest changes in the market situation occur. However, upon eliminating the probability of such risk and given the absence of more profitable alternative investments, the project could be undertaken as the investor is indifferent to other options producing the same effect. In addition, the company (or investor) may have other objectives, – for example, upon increasing production volumes to get a larger market share, attain some social/public objectives, etc.

As part of analysis of an investment project, sometimes it is purposeful to examine the NPV indicator within certain limits of discount rate variation. A graphic analysis of the results is most appropriate. The curve in Fig. 1 shows the NPV at different discount rates. This curve is called the NPV profile or contour (Ehrhardt, Brigham, 2002; Galasyuk, 1999; Horne, 2005). The NPV profile of typical projects has the shape of a downward-sloping, gradually bending curve, and only one NPV exists for each discount rate.

Two important points are marked in Fig. 1: 1) point d_n at which the NPV profile intersects with the *x* axis, and 2) point NPV^{max} at which the *y* axis is crossed. In the former case, we have a situation when the point at which the project is non-loss-making is reached, or, in other words, the maximum discount rate at which the project remains not loss-making is determined. The point of intersection corresponds to the value of

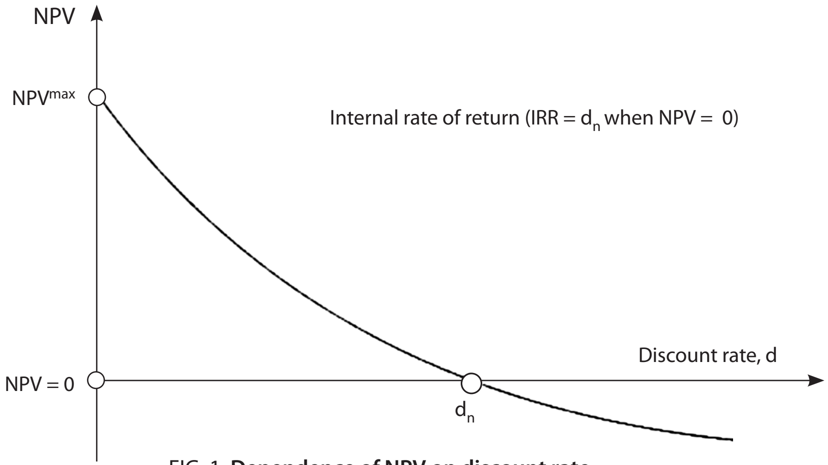

FIG. 1. **Dependence of NPV on discount rate**

Source: drawn up by the authors according to Yeomin, Youngna (2002); Keef, Roush (2001).

the internal rate of return. In cases when the discount rate exceeds this point, the NPV becomes negative (the NPV curve to the right from the point d_n).

As the discount rate approaches 0, the project's NPV approaches the non-discounted value of the project's cash flows. When the discount rate becomes 0 (point of intersection NPV^{max}), the project's NPV reaches its maximum.

The point at which the NPV profile intersects with the *x* axis is called the project's internal rate of return (IRR). The economic meaning of this method can be explained in the following way. If the funding raised for the implementation of the investment project would be used for making a term-deposit, at a certain interest rate, in a bank or another alternative investment facility, instead of earmarking them for the investment project, profit would be earned on expiry of a certain period, with the amount of the profit depending on the interest rate. Where the interest rate coincides with the project's IRR, both investment alternatives would be equivalent from the economic point of view, i. e. the same gross profit would be earned from both sources. If the interest rate offered by the bank is lower, it would be more purposeful to carry out the investment project and, vice versa, with the IRR value being lower than the interest rate, an alternative way of investment would become more attractive.

It should be noted that the IRR depends only on the internal project's parameters describing the investment project itself, with no options of using net profit beyond the limits of the project being considered. Therefore, the calculation technique should also be based only on the specific allocation of income and the investments themselves. Generally, where investments and the return on investments (income generation period) can be presented in the form of cash flows, the IRR shall be calculated from the following equation to determine the unknown d* (Copeland, Koller, Murrin, 2000):

$$\sum_{t=0}^{T}\frac{CF(t)}{(1+d)^t}=0, \tag{2}$$

where $d^* = IRR$ is the internal rate of return corresponding to cash flow *CF(t)*.

Equation (2) is equivalent to the mathematical equation raised to the power of T and is solved by the iteration method. A graphic solution of such a task is presented in Fig. 1 and involves the finding, in the NPV profile, of a point where NPV = 0. In other words, the point of intersection between the NPV profile and the *x* axis, i.e. point $d_{n,}$ is being sought for.

It is important to note that the NPV formula (1) is a linear transformation and IRR is not. This means that adding one more forecasted period to the investment project analysis directly increases or decreases the final result of NPV without changing the result of previous periods, but in case of IRR the function could change its direction, and the additional period can impact the mediate period results (Young, 1983). To sum up, in different cases the mediate period cash flows can differently impact the final result evaluated by the NPV and IRR methods.

According to the IRR method, it is assumed that any previously received cash flows are reinvested at the same internal rate of return. However, in practice this occurs quite infrequently and the internal reinvestment rates vary. In such cases, the method of modified internal rate of return (MIRR) is both more reliable and realistic.

In case of the MIRR method, interim cash flows generated by a project are reinvested at the limit rate – the capital cost rate. The modified internal rate of return is a discount rate which makes the future value of the cash flows generated by the project equal to the present value of investments, with the interim cash flows reinvested at the set limit rate.

While all cash flows are discounted to the present value, summed up and compared in the application of the IRR method, the MIRR method discounts the cash flows from operations to future value, sums them up, and then discounts them to the present value at the capital cost rate. In case of the second method, the discount rate applied is the rate of profitability of the project concerned (Yeomin, Youngna, 2002).

The MIRR value is determined from the following formula (Staroverova, Medvedev et al., 2006):

$$(1+MIRR)^t=\frac{FV^+}{FV^-}\rightarrow MIRR=\sqrt[t]{\frac{FV^+}{FV^-}}-1, \tag{3}$$

where *MIRR* is the modified internal rate of return, FV^+ is the future value of positive cash flows (in the last income earning period), FV^- is the present value of negative cash flows (at start of investments), and *t* is the period between the first investment and the last income earning period.

MIRR is the profitability of investments when the cash flow reinvestment rate is clearly defined. In theory, two rules for investment solutions are known:

1) where the project's MIRR is higher than the capital cost rate (discount rate), the project represents an attractive investment alternative;
2) where the project's MIRR is lower than the capital cost rate, the project should be rejected (Cibulskienė, Butkus, 2007).

The MIRR method has more advantages compared with the IRR method. In case of MIRR, it is assumed that all the cash flows of the project are reinvested based on the average capital costs of the company. In case of the IRR method, it is assumed that cash flows from each project are reinvested based on the project's IRR. Reinvestment based on capital costs is often more appropriate; therefore, MIRR is a more reliable indicator of profitability and is more acceptable than IRR as a characteristic of the actual profitability of a project; still, the NPV criterion should be used in the evaluation of alternative projects of different size as it shows the degree by which the corporate value will be increased (Damodaran, 2002; Ustinovičius, Zavadskas, 2004; Pike, Neale, 1999). It should be noted that MIRR always provides a correct result also in case of non-typical investment projects (which are discussed below) when the IRR value contradicts the NPV or where no IRR solution is available at all (Chang, Swales, 1999). On the other hand, some authors (Eagle, Kiefer, Grinder, 2008) note that the application of MIRR is confined to the range of non-typical projects, with IRR to be applied in all other cases.

Examining the strengths and weaknesses of the NPV and IRR methods is important for their use in the evaluation of investment projects. They are shown in Table 1. An analysis of the strengths and weaknesses of these methods reveals that conflicts between the two methods are possible.

TABLE 1. **Strengths and weaknesses of the NPV and IRR methods**

Strengths	Weaknesses
NPV method	
One of the key and most widespread methods of investment evaluation, which means that most analysts and investors are aware of it and understand it.	As an absolute indicator, it does not show the profitability (effectiveness) of an investment project.
Reflects the return on capital investments in the best and clearest way.	High dependence of the indicator on the discount rate selected. With a high discount rate, future cash flows have little influence on the NPV. In addition, one cannot always determine the discount rate objectively.
Shows the present value of money, taking account of the effect of the time factor expressed in the form of discount rate.	Discount rate is usually set the same for the entire project implementation period even though it may be subject to change if the market situation changes in the future.

TABLE 1 (continued)

Strengths	Weaknesses
Uses the entire life cycle of an investment project in calculations, taking account of cash flows generated in different periods of time.	Requires reliable long-term forecasts.
A scientifically substantiated indicator enabling an objective evaluation of projects.	The indicator is not very suitable for analysing projects with the same NPV but with different initial investments.
Presents a forecast change in business value upon completion of the investment project.	Does not reflect the investment project's security reserve.
Additive feature of the indicator (possibility to sum the NPV of individual projects to evaluate the project portfolio).	The NPV indicator shows the absolute value of the effect, i. e. the size of alternative investments is not taken into account.
Enables evaluation of projects requiring multiple investments.	
IRR method	
Results of its application are informative, objective and independent of the size of alternative investments.	Not suitable as a criterion for the rating of projects according to absolute profitability.
Shows the minimal guaranteed limit of profitability of an investment project.	Calculations are difficult without IT tools.
Enables comparison of projects with different risk levels – a project with a higher risk must have a higher IRR value.	Highly sensitive to the accuracy and reliability of calculation of future cash flows from the project.
Shows the investment project's security reserve much better than NPV.	Additional difficulties related to project selection when the result of calculations shows more than one IRR value.
Enables rating projects according to their relative economic effectiveness.	Not suitable for projects with a non-typical distribution of cash flows.
Most suitable for comparisons with the results of both alternative investment projects and alternative investments in deposits, government securities, etc.	Calculation is based on the non-linear function, therefore, it has no additive feature (no possibility to sum IRRs of several projects).
Shows the limit borrowing costs at which the project remains profitable.	Selection of a too high limit of desired profitability by the investor can result in rejection of part of effective projects.
	Reflects the effectiveness of a project appropriately, provided that the profit from the project is reinvested at the same profitability rate, which occurs quite infrequently in practice – part of the profit is allocated for dividend, part is invested in another project which bears a lower risk but is less profitable at the same time.

Sources: compiled by the authors according to Galinienė, 2005; Mackevičius, 2007; Rutkauskas, 2007; Damodaran, 2002; McLaney, 2006; Hitchner, 2006; Roche, 2005, etc.

2. Essence of the conflict between the NPV and IRR methods and cases of conflict manifestation

Continuing the analysis of the problem, the definition of the notion of alternative projects is purposeful. Alternative projects are projects that cannot be implemented simultaneously. In other words, completion of a project renders carrying out another project impossible for certain reasons (funds are insufficient or all available funds have been used; investment projects are related to alternative uses of the same object of investments, etc.). Evaluation of such projects by the NPV and IRR methods does not always produce unequivocal results and requires further analysis.

As mentioned above, generally a project with a higher NPV and IRR is selected among the alternative projects considered (see Table 2 – Non-conflict Cases). Although such situation is the one most frequently encountered in the evaluation practice, there are highly complicated cases when the answer is not obvious.

TABLE 2. **Project selection criteria at different NPVs and IRRs**

Non-conflict cases		Conflict cases	
Project A selection criteria	Project B selection criteria	Case I	Case II
$IRR^A > IRR^B$ $NPV^A > NPV^B$	$IRR^A < IRR^B$ $NPV^A < NPV^B$	$IRR^A > IRR^B$ $NPV^A < NPV^B$	$IRR^A < IRR^B$ $NPV^A > NPV^B$
$IRR^A > IRR^B$ $NPV^A = NPV^B$	$IRR^A < IRR^B$ $NPV^A = NPV^B$		
$IRR^A = IRR^B$ $NPV^A > NPV^B$	$IRR^A = IRR^B$ $NPV^A < NPV^B$		

Source: compiled by the authors.

As is shown in Table 2, Cases I and II are extraordinary. In the first case, the IRR of Project A is higher than that of Project B, while Project A NPV is, on the contrary, lower than the relevant indicator of Project B. In the second case, an analogous situation is seen for Project B. The situation when these project evaluation indicators produce opposite results is called a conflict between IRR and NPV. The problem has been examined by Jacobs (2007), Keef, Roush (2001), Ehrhardt, Brigham (2002), Brealey, Mayers, Marcus (2001), Correia, Flynn, Uliana, Wormald (2008), Galasyuk (1999), Blank (2004) and other researchers. The way of resolving the conflict offered by all the authors is to use only the NPV indicator as the basis without accounting for the IRR values.

We will try to analyse the justification of such proposal on the basis of a number of examples. Table 3 presents Projects A and B with different cash flows and NPV and IRR indicators calculated on the basis thereof.

TABLE 3. **Cash flows and results of evaluation of Projects A and B**

	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
Project A	-1.500	375	400	500	450	550	600	650	500	700
Project B	-2.500	1.125	450	500	500	600	700	700	570	1.800
IRR^A	28.01%				NPV^A, where d = 15%		742.8			
IRR^B	25.18%				NPV^B, where d = 15%		865.4			

Source: compiled by the authors.

Assuming that Projects A and B are alternative projects and cannot be implemented simultaneously, results of their evaluation do not provide an unequivocal answer concerning acceptance or rejection of a certain alternative, while Project A is more attractive according to the IRR criterion, and Project B is more attractive according to the NPV criterion. Such cases occur quite frequently and are mainly determined by the project's cash flow distribution in time rather than by the amounts of initial investment, which can be equal (Chang, Swales, 1999). As shown in Table 4, cash flows from Project C are largest at the beginning and end of the analysed period, while for Project A the distribution is more or less uniform, with some increasing trend through the life of the project. Similarly to the case of Table 3, there is a conflict between NPV and IRR; consequently, Project A should be selected according to the IRR criterion and Project C according to the NPV criterion.

TABLE 4. **Cash flows and results of evaluation of Projects A and C with equal amounts of initial investments**

	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
Project A	-1.500	375	400	500	450	550	600	650	500	700
Project C	-1.500	900	200	300	100	100	100	100	100	3.750
IRR^A	28.01%				NPV^A, where d = 15%		742.8			
IRR^C	27.90%				NPV^C, where d = 15%		797.8			

Source: compiled by the authors.

For the purposes of analysis of NPV profiles of Projects A and B described in Table 3, they should be depicted together in the same graph (see Fig. 2). Their intersection point (called also Fisher's point) shows the discount rate at which the NPVs of the projects are equal and the projects can be ranked according to another (IRR) criterion (Keef, Roush 2001). The section to the right from the Fisher's point depicts a normal non-conflict situation where both IRR and NPV unequivocally indicate selection of the same alternative (Project A). Both projects are equivalent at the point of intersection of NPV curves. Thus, the IRR and NPV conflict manifests itself only in the section to the right from the intersection point on condition $NPV^B > NPV^A$.

Applying the IRR criterion, one should assume that free cash flows from the project are reinvested in another project of the same profitability. Actually, the assumption that investments are made at a lower discount rate, which corresponds to capital costs and which is applied in the determination of NPV, would be more reasonable (Ehrhardt, Brigham, 2002). Thus, it is the NPV indicator that forms the basis for selecting an optimal investment project or for ranking a number of projects. The IRR value in this case (and in all other cases) should be understood as the limit reinvestment rate for the project, ensuring that the project is not loss-making. The following condition must be met to ensure that a project is profitable:

$$d_i < IRR. \quad (4)$$

As the condition is met in the case under consideration, this confirms once again that IRR cannot serve as a project selection criterion because a project can only be profitable

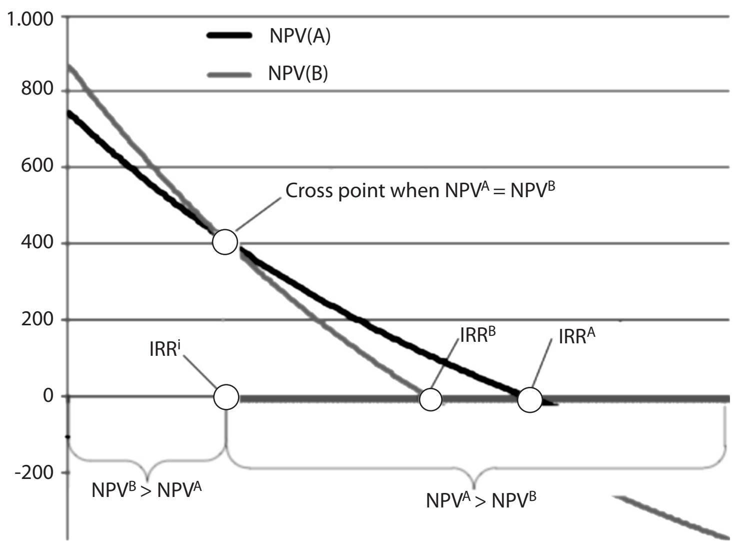

FIG. 2. **Conflict of the IRR and NPV methods with IRRA > IRRB and NPVA < NPVB**

Source: compiled by the authors according to Keef, Roush (2001).

at a discount rate lower than the IRR. Obviously, to obtain the NPV as high as possible, its discount rate (d_i) must be as low as possible, i. e.

$$d_i \to 0. \tag{5}$$

Taking into account the above circumstances, some authors (Jacobs, 2007; Galasyuk 1999) conclude that there are no grounds to identify the situation as a conflict between NPV and IRR as, formally, no conflict exists. On the other hand, it is recognised that where the IRR value is treated as a reinvestment rate and not as a set of potential discount rates, there still exists a contradiction between the investment efficiency criteria being considered.

Some of the authors (Ehrhardt, Brigham, 2002; Brealey, Mayers, Marcus, 2001) relate the NPV and IRR conflict only with an alternative project evaluation, but others (Damodaran, 2002; Galasyuk, 1999; Franco, Galli, 2005 and others) state that NPV and IRR conflict is typical also when evaluating more than two projects (which are not necessarily eliminating one another) by performing a set ranking. This view can be considered as more correct, because NPV and IRR conflict depends on cash flow distribution of the projects, although it becomes relevant for the investor only in cases he cannot implement both projects together.

The conflict under consideration is one of the reasons why the above-mentioned modified internal rate of return has been proposed: it allows avoiding the contradictions as it uses a separate discount rate equal to the company's capital cost rate for reinvestment purposes.

3. Technique for resolving NPV and IRR conflict

Although in the works of foreign authors the NPV and IRR conflict receives some attention, many authors (Franco, Galli, 2005; Keef, Roush, 2001; Eagle, Kiefer, Grinder, 2008, Horne, Wachowicz, 2005 and others) usually analyze the reasons for this conflict or emphasize the preference of other indicators (NPV, MIRR). Theoretically, it is a very important moment, but in practical cases there is no consistent methodology of evaluating different method application possibilities and unambiguously treating the results of employing each method.

Considering the examples described above, a universal technique enabling evaluation of any two alternative projects according to their NPVs and IRRs was elaborated. The technique of evaluation of investment projects presented in Fig. 3 allows analysing cases irrespective of whether or not the NPV and IRR conflict is present.

The technique does not include the processing of data and the analysis of specific calculation of NPVs and IRRs (MIRRs). It is assumed that the calculated values of the indicators under analysis are correct and do not depend on the methods of calculation of

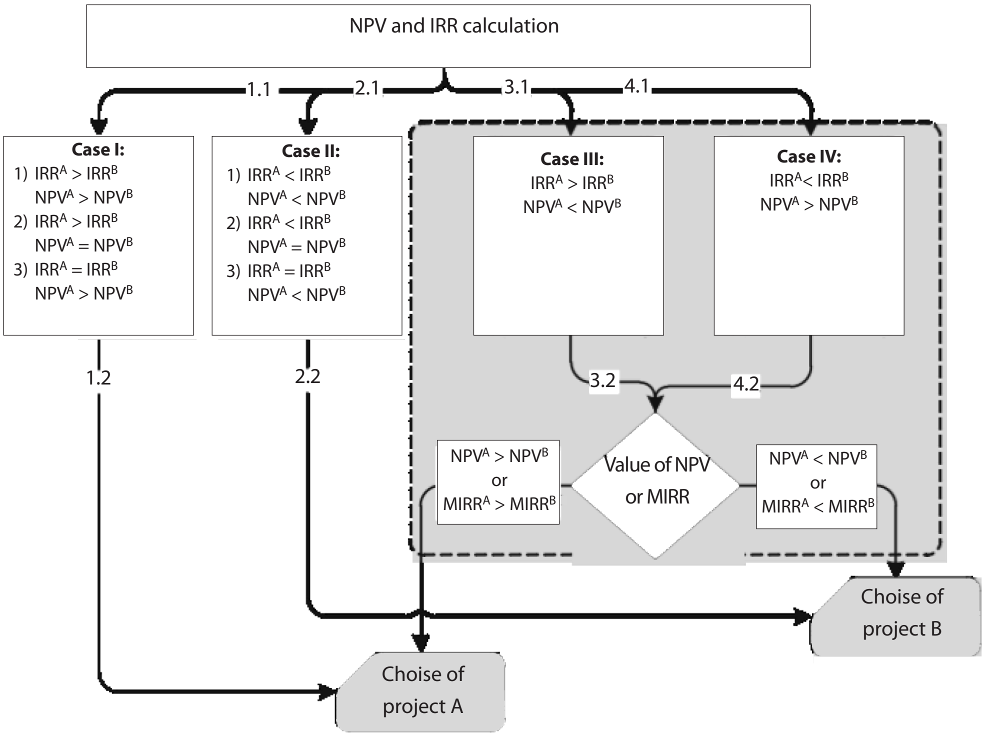

FIG. 3. **Technique for the resolution of conflict between the IRR and NPV methods**

Source: compiled by the authors.

the investment project cash flows, the effect of risks or discount rate values. Although the technique involves a comparison of two alternative projects only, the total number of projects under evaluation is not limited, and the evaluation can be made by rating and elimination.

Based on the NPVs and IRRs calculated in Steps 1.1, 2.1, 3.1 and 4.1, four key groups of evaluation results are identified and divided into normal cases (I–II) and conflict cases (II–IV). In I–II cases, when the results obtained by the NPV and IRR methods correlate, the decision on acceptance or rejection of a project is adopted taking account of the calculated values (Steps 1.2 and 2.2): where NPV is positive and IRR is higher than the applicable discount rate, the project is accepted; otherwise it is rejected. Cases III and IV (Steps 3.2 and 4.2) rely upon the above assumptions that NPV or MIRR forms the basis for evaluating an investment project in a conflict situation. In this case, a MIRR may be determined additionally or NPVs of alternative projects can be compared.

Conclusions

In the methodology of evaluating investment projects, the net present value (NPV) method and the internal rate of return (IRR) method are recognised as the most reliable and widely used ones. In practice, an investment project analysis assumes that the reliability of these methods is equal and the result of any of them can serve as a criterion for the acceptance or rejection of a project.

The NPV method is based on the concept of net present value and shows the amount by which the aggregate project income exceeds the aggregate payments. When NPV > 0, the investment project is considered effective and, vice versa, when NPV < 0, the project is considered ineffective from the economic point of view and is rejected.

A discount rate at which the NPV is equal to zero is called the internal rate of return of a project. IRR depends on inner project parameters only that describe the investment project itself, with no uses of net profit beyond the project being analysed. The IRR method is usually the priority one as it is more understandable and obvious to investors. At the same time, it allows an easier ranking or elimination of projects according to profitability rate, the minimum value of which is set by the investor.

In most cases, the results of both NPV and IRR analyses are the same; however, conclusions upon evaluating non-typical projects can be different. A situation where these indicators used in project evaluation produce contradictory results is called the IRR and NPV conflict.

Applying the IRR criterion one should assume that free cash flows from the project are reinvested in another project of the same profitability. Actually, an assumption that investments are made at a lower discount rate, which corresponds to capital costs and which is applied in NPV determination, would be more reasonable. Thus, it is the NPV indicator that forms the basis for selecting an optimal investment project or for ranking a number of projects. MIRR could be an indicator alternative to IRR, with the assumptions of calculation not contradicting the NPV method.

Taking account of the above conclusions, the authors have developed a technique for evaluating investment projects enabling an analysis of any alternative projects and the selection of most effective ones. Grouping of project results according to the calculated NPV and IRR values forms the basis of the technique. In the first stage of analysis, four key groups of evaluation results are determined. Normal and conflict cases are identified in these groups. In normal cases, where there is a correlation between the NPV and IRR results, a decision on a project is made depending on the calculated values: when NPV is positive and IRR is higher than the applicable discount rate, the project is accepted; otherwise it is rejected. Conflicts are resolved on the basis of NPVs or MIRRs, ignoring the values of IRR.

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