ON THE NON-FINANCIAL DIMENSION OF PROJECT EVALUATION

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ABSTRACT

This paper presents a summary of a recent literature review, focused on the limitations of the traditional project evaluation techniques and the proposed frameworks to address non-financial aspects. Traditionally the decision investment process has been based on the analysis of the financial viability of the project and the associated evaluation techniques have indeed many advantages. However, exclusively trusting on these methods may lead to the rejection of investments strategically important to the companies. Also, the non financial aspects represent important additional risk and uncertainty dimensions not easily included in the appraisal procedure. The importance of the integration of the non financial criteria is already recognized in the literature and by many decision makers. The authors expect to contribute to this debate, providing a list of the non-financial risk dimensions that must be addressed for the investment decisions, in order to ensure a more reliable project evaluation and/or selection procedure.

Keywords: project evaluation, non financial risk, evaluation criteria

1. INTRODUCTION

The financial aspects of projects have long dominated the decision making process and project evaluation, in order to assure the project success measured in terms of financial benefits to the companies. However several recent studies defend that this purely financial analysis fails to consider other aspects that may be essential for the project or even company viability in the future. In fact, the financial evaluation process does not take into consideration two important elements: the existence of the non financial objectives (public or private) and the existence of the non financial risk and uncertainty factors.

The evaluation process is strongly dependent on the decision maker characteristics and objectives. Large public or private projects frequently have external effects that transcend their...
boundaries. Their viability is then conditioned by other’s objectives, as it happens for example when the project is subject to legal constrains or to constrains’ imposed by the financial entity.

Also, the increasing number of public and private partnerships for some projects encourages the adoption of less rigid decision models. The appraisal and risk evaluation processes must consider the different perspectives of the public (more concerned with social objectives) and private (more concerned with financial objectives) sector entities (GRIMSEY and LEWIS, 2002).

Additionally, many decision makers recognize also the importance of other than financial objectives as competitive advantage, market share or future growth (STWERT and MOHAMED, 2002), showing concern for the strategic dimension of the investment in the organizational context. These strategic investments are complex and the revenues are uncertain. As stated by ALKARAAN and NORTHCOTT (2006), they present a particular challenge for management accountants as its value may overcome its direct capacity of creating economic value to the company.

Traditional appraisal techniques, such as Return on Investment (ROE), Internal Rate of Return (IRR), Net Present Value (NPV) or pay back time, are based on conventional accountancy frameworks. They are designed to assess the financial impact of an investment, by setting the costs against quantifiable benefits and predicted savings, and are unable to accommodate the often significant strategic dimension of the project (PATEL and IRANI, 1999). Over reliance on financial tools may bias decision makers against undertaking crucial strategic projects (ALKARAAN and NORTHCOTT, 2006).

As ADLER (2000) pointed out, the lack of cohesion or strategic sequence on the decision making process, often result from the inability of integrating the qualitative aspects in a traditional discounted cash-flow analysis. This way, an excessive concentration on financial indicators may lead to the unrecognising of the strategic implications of the decisions made.

LOPES and FLAVELL (1998) defend that the analysis of a project, even in the private sector, should also include non financial dimensions which may cause the failure of the project, despite very favourable financial or technical components. A detailed study must consider organizational and managerial aspects, political aspects, social acceptability or environmental problems.

GRIMSEY and LEWIS (2002) present a list of the risks faced by infrastructure projects, where financial and non financial issues are included, such as technical, political or environmental risk. Additionally, other studies like MOBEY and PARKER (2002), DEY (2001) and CLEMONS, TATCHER and ROW (1995) support the evidence of the importance of a proper non financial risk assessment.
This paper, focuses in the incorporation of non financial risk and non financial objectives, on the decision investment process. The objectives of this study are to analyse the main problems of the purely financial evaluation methods (traditional) that place serious doubts about their complete reliability and, to address new frameworks for project evaluation that incorporate the non financial risk dimension.

The structure of the paper is as follows. Section 2 describes the main limitations of the financial evaluation techniques. Section 3 presents the major non financial dimensions that should be addressed during the evaluation process. The main conclusions are summarized in section 4.

2. FINANCIAL EVALUATION

The decision investment process usually comprises certain core elements and the estimation of predicted values. Figure 1 represents this process and shows the main steps based on SHANK (1996), ANADARAJAN and WEN (1999) and HAYES and GARVIN (1982). The process begins with identifying the spending proposals, followed by their quantitative and qualitative evaluation. However, as pointed out by SHANK (1996) the quantitative analysis gets nearly all the attention and the final decision derive largely from it. As HAYES and GARVIN [11] notice, the financial appraisal requires the estimation of the size of the investments, the amount and timing of the future cash flows and the hurdle rate, based on alternative investments.

![Figure 1- Decision investment process.](image)

1 The interested reader may found additional information on the economic project evaluation methods and techniques in REMER and NIETO (1995 a and b).
The traditional appraisal techniques (specially the NPV and IRR) present some significant advantages that justify their popularity among decision makers, namely (ANADARAJAN and WEN, 1999 and MILIS and MERCKEN, 2004):

− Their contribution to the evaluation of projects with delayed benefits.
− Their objectiveness and ability to be applied equally to the whole spectrum of investment alternatives.
− Their ability to recognize the gains generated by each project and its direct impact on the company profit.
− They base themselves on well-known and generally accepted principles.

However, several authors recognize fundamental limitations on the excessive reliance on the conventional appraisal techniques. A survey of recent literature, allow identifying some of the major criticisms pointed to the traditional approaches:

The evaluation of intangible benefits, since the traditional techniques only address tangible costs and benefits associated with the project (PATEL and IRANI, 1999) The purely financial analysis may be misleading for projects that will bring strategic intangible benefits for the company. As ADLER (2000) pointed out, some of these benefits, such as improvements on organizational learning or production flexibility, reveal themselves indispensable for other future projects, or to the company access to new technologies.

This problem emerges for example for the evaluation of IT/IS (CLEMONS, TATCHER and ROW, 1995 and PATEL and IRANI, 1999) or advanced manufacturing systems (ABDEL-KADER, 1999 and ANANDARAJAN and WEN, 1999) investments. Traditional techniques often overlook the intangible benefits that flow from these projects, like greater manufacturing flexibility, improved product quality and costumer satisfaction, creation of competitive advantage, among others.

The ambiguity of the project, which makes unclear the identification of the targets and may result in different perception of the objectives by the decision makers. Investments on quality can be seen as an example. The judgement of the quality of a product or service is subjective making it difficult to separate “good” and “bad” quality and “right” and “wrong” decisions. Thus the identification of the quality targets and the measurement of the achieved performance become very complex procedures, hard to quantify in an objective way (NOCI and TOLLETI, 1998).

Another example is given with the AGARWAL and RATHOD (2006) work. The authors focus on
software projects and argue that the notion of success of a project can be different for different stakeholder, whether they are customers, developers, project managers or owners.

As MESSNER and SANVIDO (2001) pointed out, the project evaluation decision is made through an intuitive and, in some cases, emotional manner. In fact, the traditional methods do not take into account the subjective opinions of the decision maker, based frequently on their valuable past experience, and which hardly can be translated in exact numbers and/or monetary values.

The wide set of effects on the whole company, making it difficult to predict and evaluate accurately the impacts of the investment individually. This happens frequently in IT/IS or quality projects which have a strong effect on all the activity sectors of the organization.

ADLER (2000) refers that the investment proposals are often analysed from the sole perspective of the investment department, overlooking the benefits that the project will bring to other company departments. COUNIHAN, FINNEGAN and SAMMON (2002) give also the example of infrastructural investments. As these projects benefit the organisation as a whole it is difficult to attribute their costs to a unique business area.

This way, there is no clear relationship between the project and the company profitability, as the benefits will not accrue to one particular area of the business but will improve the overall effectiveness of the company. However, the traditional investment appraisal techniques assume that this relationship is explicit and measurable (COUNIHAN, FINNEGAN and SAMMON, 2002).

Assuming status-quo as an alternative to the project. This way, traditional investment appraisal techniques assume that the market and environment will remain static regardless of the investment decision. However, this may lead to the exclusion of projects of long-term strategic importance, which could have negative strong impacts on the company future performance (COUNIHAN, FINNEGAN and SAMMON, 2002).

This assumption is only true if the cost, quality, flexibility, and innovation features of the competitors remain static. But, as KAPLAN (1986) state, if once a new process becomes available it is highly probable that some of the market competitors invest in it. This way, the financial analysis only gives information concerning the cost of investing, it does not inform on the cost of not investing (ADLER, 2000).

Also ANANDARAJAN and WEN (1999) refer themselves to this problem and suggest that the projects should be evaluated comparing cash flows not with the current practice, as if nothing changed, but with the current practice evaluated under the likely effects.

The existence of non economic factors, like social, environmental, political or legal aspects that are additional risks for the successful accomplishment of the project (LOPES and FLAVELL, 1998) The traditional techniques deal with risk and uncertainty often by increasing the
discount rate or by probability analysis. However, this requires detailed quantitative information which is not normally available, once these non-economic factors are subjective and ill defined.

ABDEL-KADER (1999), gives the example of investment decisions in advanced manufacturing systems. He refers that the high risk inherent to this new technologies often leads to the use of arbitrarily hurdle discount rates since, as ANARADAJAN and WEN (1999) pointed out, it is difficult to adjust the discount rates for project risk.

When a project is considered, there are different parties involved each with different objectives. Focusing all the evaluation process on the traditional financial methods, implies that only the management objectives are taken into account. It neglects the criteria of the other parties and fails to incorporate factors that may be of crucial importance for the project acceptance and willingness of the other parties to cooperate (MILIS and MERCKEN, 2004).

The Short term focus, which jeopardize the evaluation of strategic investments like the introduction of new technologies, which may take a long period to become fully operational. The use of the payback method is a clear example of how the long term project will be in disadvantage (ADLER, 2000). MILIS and MERCKEN (2004), also refer that companies using the payback method tend to accept too many short-lived projects and reject too-many long lived ones.

Additionally, the discounted cash flow methods may also promote the short-term decision horizon, since the use of high discount rates will greatly reduce the benefits associated with the later years’ cash flows. This short term bias is also supported by the adoption of a single, unchangeable discount rate. This fails to assume that the project risk is highest in the initial phases (pre-implementation and start-up) and decreases once the project is put on line (ADLER, 2000). HAYES and GARVIN (1982) also support this point of view and argue that frequently the hurdle rates are unreasonably high, which implies a stronger emphasis on near-term benefits.

As MILIS and MERCKEN (2004) pointed out traditional investments appraisal techniques are conservative in nature. The use of these techniques may lead decision makers to choose unreasonable short-term solutions, rejecting projects with high risk and long-term pay-off, this way discouraging innovation and limiting creativity. HAYES and GARVIN (1982) go to the extent of submitting that the discounting approach has contributed to the decreased willingness to invest.

The limitations of the traditional evaluation methods make clear that relying only on the financial analysis is often not enough to assure the success of each individual project, and, in the long term, may even jeopardise the future survival of the company. As so, the project evaluation decision requires a vast amount of information, concerning all the risk dimensions that must be assessed.
In spite of these limitations, conventional evaluation concepts remain very popular (see for example MILIS and MERCKEN, 2004, AKALU, 2003 or ALKARAAN and NORTHcott, 2006). This led some authors to propose adjustments to these techniques that contribute to overcome some of their major criticisms and simultaneously allow keeping their use. MILIS and MERCKEN (2004) present some examples of adjustments suggested by several authors, including alternative estimations of cost and benefits, the use of probabilities and the use of sensitivity analysis for discount rate assessment. In another work, ANANDARAJAN and WEN (1999) developed a framework that allowed incorporating both tangible and intangible benefits along with the hidden costs in NPV and IRR calculus. DEY (2001) presents an example that included the application of probabilities and decision trees to the project evaluation and JOVANOvIC (1999) discussed the sensitivity analysis in investment project evaluation.

HODDER and RIGGS (1985), support that the problem of using discounted cash flow analysis lies not in the techniques but in its misuse by the decision makers. They point to problems like improper use of inflation effects in long-lived projects and the excessive risk aversion. This last aspect derives mainly from using a single and high discount rate, not recognizing different risk phases in a project and from not considering the possibility of investment diversification. The authors remember the importance of the discount cash flows techniques for assisting the decision process, but also remember that the decision makers should be aware of the potential problems and examine the assumptions considered during the calculations.

3. NON-FINANCIAL DIMENSIONS

A review of the recent literature allowed identifying the main non-financial risk dimensions that must be included in the decision process. A structured methodology, for collecting and incorporating this additional information for each project, is fundamental to meet the most important criticism associated with the traditional methods, as it is pointed out in this section.

– Strategic aspects

These aspects are associated with the compatibility of the project with the company objectives (strategic level) and with the present activities of the company (synergetic level). The analysis of the risk inherent to the project should also be included, as well as its effect on the overall riskiness of the company (risk level) (LOPES and FLAVELL, 1998).

2 LOPES and FLAVELL (1998) present a framework to assess all non financial risk factors of projects, their relative importance and how they can be incorporated in the appraisal procedure. This section is mostly based on the work of these authors.
This is a fundamental aspect, since the purely financial analysis does not easily recognize projects that may bring future competitive advantages to the company, as it is proclaimed by several authors such as STEWART and MOHAMED (2002), ADLER (2000) or KAPLAN (1986). In fact, a large part of the limitations pointed to the traditional methods are due to their inability to deal with the strategic dimension of the project. This dimension can be associated, for example, with the existence of intangible benefits, or with the overall future gains to the company brought by an individual project, or with the short term vision.

This way, when evaluating a project, the company must consider information regarding the advantages and disadvantages that they have in relation to their competitors for the project. Aspects like the number of potential and present competitors, their goals and resources, are critical when evaluating new projects (MESSNER and SANVIDO, 2001).

-- Technical aspects

These factors are associated with the technical viability of the project. During the project appraisal, questions like the project complexity, the lack of knowledge regarding new technologies and their rapidly changing nature must be addressed avoiding the possible underestimation of these difficulties (LOPES and FLAVELL, 1998). In addition, MILIS and MERCKEN (2004), refer the technical risk associated with large and complex project that may overwhelm the staff’s skills.

In a study from DEY (2001) technical risk is considered the major factor for time and cost overrun of the project. Aspects like scope change, technology and design change, technology and implementation methodology selection are the major causes for project failure.

Also MOBEY and PARKER (2002) highlight the importance of evaluating the project risk associated with technology failure, and with the poor knowledge level of potential users, relatively to the complexity of the system. As LOPES and FLAVELL (1998), these authors also point to the need of using prototypes and pilot tests.

-- Political aspects

The political aspects environment includes factors imposed by governmental or overseeing organisations. During the project selection and evaluation, aspects like the political system type, the political stability or the government policies, must be considered. The legal environment is also associated with this political dimension, being fundamental to analyse the existing laws and regulations, the enforcement of laws and the penalties for non-adherence (MESSNER and SANVIDO, 2001). TUMMALA and BURCHET (1999), identified a list of potential political risks
for a EHV transmission line project, where they include issues like changes in laws and regulations, safety rules or the need for public consultation.

Most large scale projects will face some political interference, associated with legal authorisations, funding or legislation, among others. The political risk is of special importance if the project is going to be established in a former country, once it will be susceptible to local policies, bureaucracy or political instability (LOPES and FLAVELL, 1998).

− Social aspects

Most major projects will have some degree of social impact on the local community. This impact may be associated with the possibility of job creation, public health or local real estate among others. If the negative aspects are not considered and dealt during the project analysis, they may lead to significant social opposition, causing delays and forcing project changes or even its cancellation (LOPES and FLAVELL, 1998).

The cultural questions must also be addressed during the social studies, especially for overseas projects. The cultural environment will have a strong impact on the management techniques, negotiation styles and living environment within a location. This way, factors like hierarchical structure of groups, collectivism, attitude towards work or problem solving attitude, will influence the operations and consequently the project success (MESSNER and SANVIDO, 2001).

MESSNER and SANVIDO (2001), refer also the need to consider all the commitments that the company or organisation has when evaluating projects, such as, for example, commitments with unions or agreements with competitors. In addition, TUMMALA and BURCHET (1999), identified as important risk factors the ones associated for example with labour disputes and strikes, labour productivity or defective work.

− Environmental aspects

Environmental impact is especially important to be considered for projects involving large constructions, or in the process mining and energy sectors. The need for this analysis is associated with the aim of minimizing the damages caused by the project, complying with the local regulations and at the same time avoiding great social opposition (LOPES and FLAVELL, 1998).

In recent years the environmental factors have become increasingly important. For example European Directives (EC 85/337 and EC 97/11) require environmental impact assessment for large transport infrastructure projects and a public discussion of this assessment is required before consent is granted [5].
Organizational and managerial aspects

The success of the project is largely dependent on the working team and on the way they interact with each other. Authors like MOBEY and PARKER (2002) and CLEMONS, TATCHER and ROW, 1995 emphasise the human risk, as an important factor that may contribute to the project failure. That is why, questions like the organizational structure, partnership relations, communication systems, work atmosphere, and motivation, must be addressed during the project appraisal (LOPES and FLAVELL, 1998).

LOPES and FLAVELL (1998), point also to the important role of the project manager, on creating good team spirit and motivating the project members. The selection of the team elements is also crucial, assuring their individual expertises and their capability of working as a team. The communications and dissemination of information are vital and must be assured by the project manager.

The need to address the question of the organisational and human risk during the project appraisal process is highlighted by several studies, which attribute the failure of many projects to the organisational resistance or lack of commitment (MOBEY and PARKER, 2002). MILIS and MERCKEN (2004) address also the question of lack of cooperation of the company staff, which they named as internal political risk. SARKIS, PRESLEY and LILES (1995) supported that the human and organizational factors must be taken into account for the successful implementation of technologies.

Another dimension of the organizational and managerial risk arises if the project is pursued by a consortium. MESSNER and SANVIDO (2001) point to the need of evaluating the project from the perspective of the consortium, and evaluate the project and organization participation within the consortium, from the perspective of each individual organization/company, and each own strategic goals. DEY (2001) refers himself also to the organizational risk, associated with the capabilities and the possibility of failure of organizations directly related with the project (consulters, constructors or vendors).

Physical environmental aspects

The question of the physical environment and the risk associated with it must also be addressed during the decision investment process. The evaluation of each project should include factors like the geological and geographic characteristics of the location or the possibility of natural disaster occurrence (MESSNER and SANVIDO, 2001 and GRIMSEY and LEWIS, 2002) and the existence of contingency plans (DEY, 2001).
Additionally, the availability of essential resources for the project pursuit must be considered. This includes for example human resources, raw material, knowledge or transportation means, among others (MESSNER and SANVIDO, 2001).

4. CONCLUSIONS

The limitations pointed to the traditional appraisal techniques arrive mainly from their incapacity to deal with the non financial dimensions of the projects. This way, blindly trusting on these criteria may result either on choosing projects that do not meet the strategic goals of the company, or on rejecting important investment opportunities. Additionally, the non financial aspects represent important risk dimensions which can cause the failure of the project.

Project evaluation decision requires a vast amount of information concerning not only the financial implications of the project but also concerning aspects like the strategic interest of the project, its technical viability, its social and environmental impact and the organisational ability to accomplish it.

The integration of the financial and non financial issues on the project appraisal process, although being fundamental, is not an easy and consensual task. For example, social cost/benefit analysis is used frequently for the public evaluation of projects (see for example BRISTOW and NELTHORP, 2000) as an attempt to quantify and incorporate all significant impacts of the project on the society. Several works propose the use of multi criteria methods (see for example JANSSEN, 2001 or POHEKAR and RAMACHANDRAN, 2004, among many others). On the other hand LOPES and FLAVELL (1998) propose the use of a framework for systematic collection and analysis of information without attempting to assign weights or scores. ALKARAAN and NORTHCOTT (2006) also present some possible approaches to strategic investment project appraisal, including for example the balanced scorecard, real options, among others.

The authors intend to proceed with the study, in order to perform an in-depth analysis of the alternative approaches to project evaluation, whether by modifying the traditional techniques or by breaking with these ones. A structured approach for collecting and integrating financial and non financial information for project evaluation is fundamental to overcome the most important criticisms associated with the traditional methods.

5. REFERENCES


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