

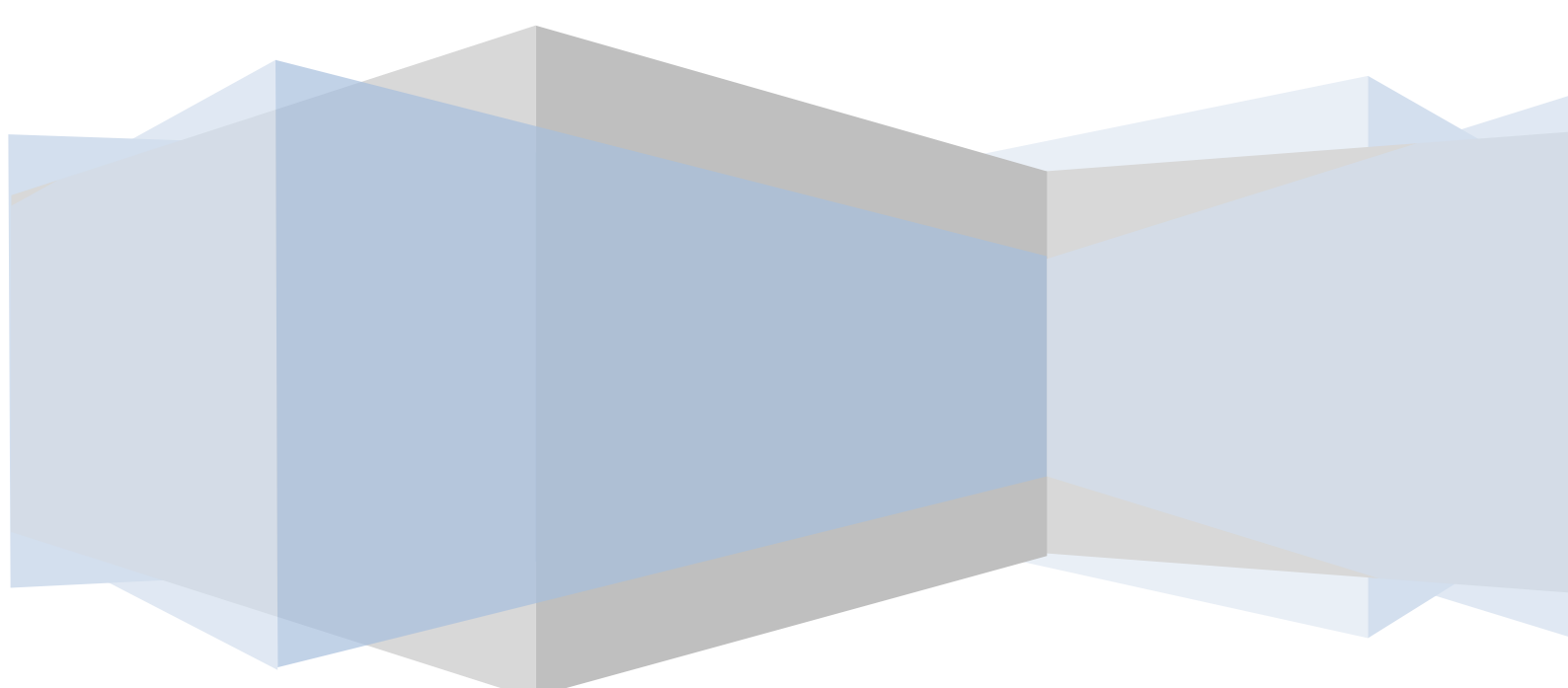
FINANCE AND ACCOUNTING END-OF-DEGREE PROJECT
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FESG RISKS ON MAJOR PROJECTS

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ABSTRACT

This work aims to introduce, along with traditional indicators of financial risks, risks arising from social, environmental and corporate governance performance in a valuation model, to appraise major projects more appropriately, considering weighting risk includes all risks, so far not considered in the decision process yet.

The need for non-financial risks in funding decisions for major projects arises. Therefore, in this work, a detailed study of what is being done in the professional field to assess the Project Finance and the main results of the academic research on this issue is made. After this analysis, it is concluded with the contribution of a valuation method of project finance introducing environmental, social and corporate governance in the before mentioned process.

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1. INTRODUCTION

Major projects are characterised by being specifically targeted at the sectors of energy, construction of highways, airports, fishing ports; large civil works such as hospitals, universities, etc. All this is related to a high cost, which is unlike the financing of these projects to any other.

An example of big project is the "Castor Project" which was based on the construction of an artificial reservoir of natural gas to supply the Spanish energy demand of gas in short supply. This project model will be used as reference throughout the report.

The existence of various failures in the implementation of major projects over recent times has made us think that something has gone wrong in assessing the foresaid.

Current feasibility studies try to foresee the risks that can financially make a project nonviable, but they do not analyse in depth a number of other non-financial risks associated with these projects, such as the environmental effects that may be incurred in its implementation or their impact on society.

In this context, it seems necessary to improve the risk assessment models that can achieve a full, thorough and reliable assessment of the projects introduced in the estimation process, financial risks and non-financial risks associated with the project.

The aim of this paper is to examine the current state of research on the integration of non-financial risk in the evaluation of large projects, in order to analyse whether the integration of such risks would be possible with existing financial models of project appraisal.

The investments destined to the implementation in major projects are significant quantities and the investors deserve a thorough feasibility study, to do their investments safe.

The completion of a large project requires private and public funding; this last resource should be treated in a very delicate way, poring any risks that may turn the project into a potential loss globally.

Progress is needed in the search for a precise and accurate way to assess non-financial risks because there is no official regulation that can steer research toward an effective solution.

Therefore, with this work, from an academic perspective a progress will be made in the existing literature on risk analysis non-financial and, from the professional perspective, guidance will be provided on those key non-financial risks to assess the feasibility of large projects.

This paper is organized as follows: after a brief introduction a theoretical framework is introduced. This one defines the Project Finance subsequently financial and non-financial risks and the methods used to measure. The methodology used consists of a meta-analysis of the literature which will reveal how it is being evaluated the risk on large investment projects. Subsequently, the results induced deep analysis will be presented. Finally, the work will conclude with a global assessment and proposals that complement the literature.

2. THEORETICAL FRAMEWORK

2.1. Project Finance

Project Finance is an important method in the development of private sector financing, defined as financing projects where repayment of the loan depends on the income generated by the project once established and in operation. Therefore, the financing of the project does not depend so much of the value of the assets that the sponsors are willing to put up as collateral the project, and the project's ability to pay the debt and remunerate the capital invested.

In this situation, the issues associated with the evaluation of risks taken by financial institutions at the time of the granting of these transactions appear as fundamental.

If at the assumption of financial risks we add the location of the project in certain areas of the planet, we face the need to manage other risks.

The basic implications of managing a large project are:

- There is total independence between the assets of the promoters and project purpose vehicle (SPV) to be the owner of the assets of the project, this shall have legal personality.
- Profitability and risks must be well defined and be consistent. The risks will be borne by the different parties involved in the project.
- The flows generated by the Project Finance are the responders of the generated debt.
- The project requires a significant initial investment which results in a high financial leverage and a long-term maturation period, that is, costs in the initial phase are very high and do not benefit, in the final phase there is a course change in this initial trend and the project generates more benefits incurring lower costs.

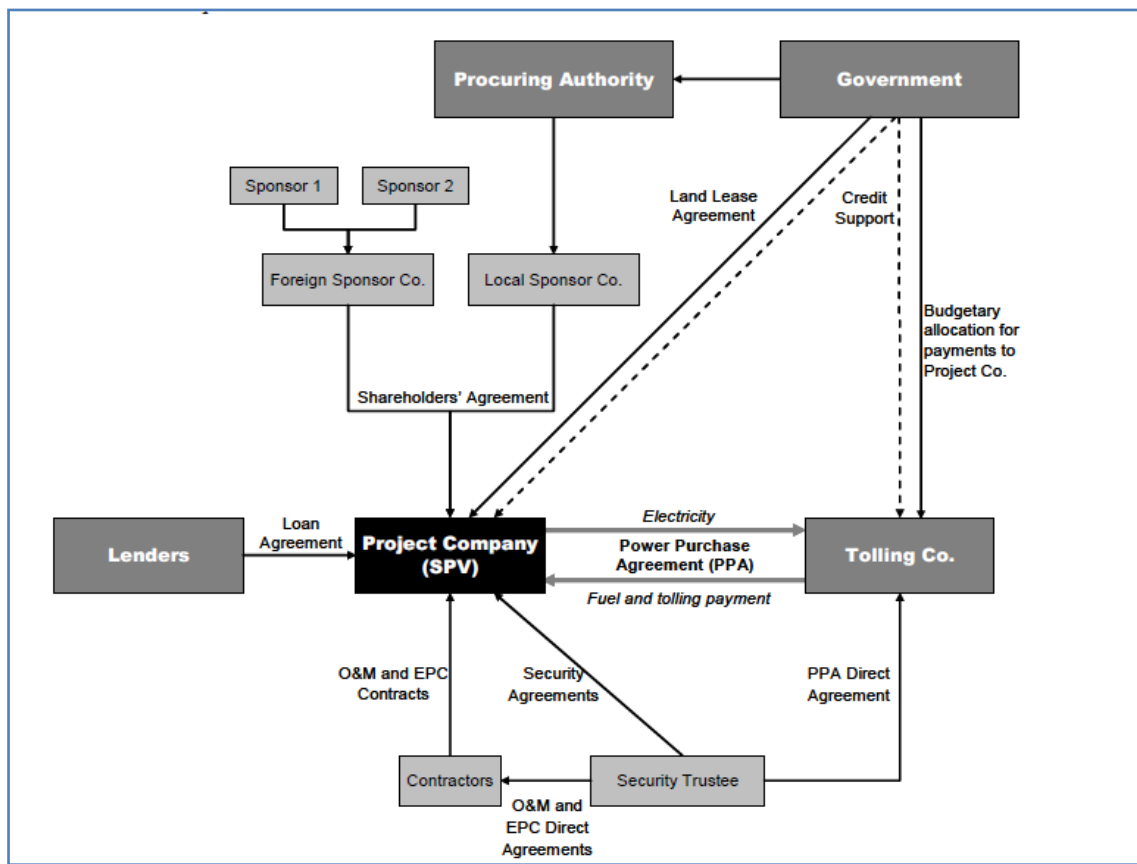
The agents involved in project finance are: sponsors, procurers, government, contractors, feedstock provider (s) and / or offtaker and lenders. The following main functions are listed, with the support of such a large project aimed at obtaining primary energy and its subsequent conversion into electricity (table 1).

Table 1: Typical stakeholders of a Project Finance transaction

Stakeholder	Summary of role in a project financing
Sponsors	<ul style="list-style-type: none"> • The equity investor(s) and owner(s) of the Project Company – can be a single party, or more frequently, a consortium of Sponsors • Subsidiaries of the Sponsors may also act as sub-contractors, feedstock providers, or offtaker to the Project Company • In PPP projects, the Government/Procurer may also retain an ownership stake in the project and therefore also be a Sponsor
Procurer	<ul style="list-style-type: none"> • Only relevant for PPP - the Procurer will be the municipality, council or department of state responsible for tendering the project to the private sector, running the tender competition, evaluating the proposals and selecting the preferred Sponsor consortium to implement the project
Government	<ul style="list-style-type: none"> • The government may contractually provide a number of undertakings to the Project Company, Sponsors, or Lenders which may include credit support in respect of the Procurer's payment obligations (real or contingent) under a concession agreement
Contractors	<ul style="list-style-type: none"> • The substantive performance obligations of the Project Company to construct and operate the project will usually be done through engineering procurement and construction (EPC) and operations and maintenance (O&M) contracts respectively
Feedstock provider(s) and/or Offtaker	<ul style="list-style-type: none"> • More typically found in utility, industrial, oil & gas and petrochemical projects • One or more parties will be contractually obligated to provide feedstock (raw materials or fuel) to the project in return for payment • One or more parties will be contractually obligated to 'offtake' (purchase) some or all of the product or service produced by the project • Feedstock/Offtake contracts are typically a key area of lender due diligence given their criticality to the overall economics of the project (i.e. the input and output prices of the goods or services being provided)
Lenders	<ul style="list-style-type: none"> • Typically including one or more commercial banks and/or multilateral agencies and/or export credit agencies and/or bond holders

Source: "Project Finance – Chapter 12" - David Gardner and James Wright (HSBC)

Exhibit 1: Example Public-Private Partnerships contractual structure



Source: "Project Finance – Chapter 12" - David Gardner and James Wright (HSBC)

As shown in the above scheme (Exhibit 1), a Project Finance is a contractual network around a company created for this purpose, in which each participant is linked to it by a contract that governs every part of the process.

Each participant may incur various tasks, such as banks or government agencies, can be project sponsors and financiers at the same time, this makes the costs for participants, sharing functions within the process, they are less and benefit from higher inflows.

Risk management in the process of project finance is crucial for the generated lattice work. If the risks are not provided properly can cause a negative impact on the different stages of the process and make the project remains technically bankrupt. It is vital to predict how they will influence the risk factors in the expected cash flows, to an unexpected change of these factors, for once identified and analysed, to take appropriate action to mitigate them.

Risks can differ depending on the phase the process of the large project is located:

- Partners associated with the construction phase of the facility, these are in which can be incurred in the initial period. It is important to manage them in a careful manner because the project during the first phase does not generate positive cash flows. They mainly concern the activity planning, construction and technology aspects.
- Subsequently the risks associated with the operational phase are identified. Deviations may undertake with respect to the initially planned standards, how index produced sales or cost of raw materials are included. The risk management at this stage is as important as in the initial phase, because if cash flows decrease, lenders and sponsors will impair their primary expectations.
- There are other common risks to the two phases described above. Those that deal with macroeconomic indicators such as interest rates, inflation, etc. There can also be risks related to the environment, regulatory risks and legal risks.

To manage the risks referred above, it is usual that the strategy used in Project Finance, is that each institution involved have to bear the cost and risk will be the best way to manage it and control it. In this way, each party has the incentive to respect the initial agreement in order to avoid the negative effects caused by the appearance of the risk involved. If a risk is posed and assigned to a third party, it will bear the cost of risk without affecting the SPV or its moneylenders. This is the main use of project finance contracts that assign rights and obligations to the VPS and its partners as an effective risk management tool.

2.2. Financial Risks

2.2.1. Definition

According to Gomez and Partal (2010) the risk is generally defined as the probability of a negative situation in the future, and from a financial point of view, the possibility of suffering a loss of economic value. The risk is associated with the concept of uncertainty, when to the likelihood of effective loss is referred, and the amount and instant thereof in which can be materialised.

Financial risks can be classified into the following categories according to Gomez and Partal (2010):

- Market Risk: Uncertainty supported by an investor or financial institution to unexpected market changes. Measured through the process of estimating the value at risk (VaR).
- Credit Risk: "Potential loss caused by a variation in the conditions and characteristics of the counterparty's ability to alter it to meet its contractual obligations¹." Measured by the expected loss and the unexpected loss (SD) following the model of default.
- Liquidity Risk: Possibility that no response to the payment obligations in the short term. Measured by GAP or sections defining liquidity gap analysis duration.
- Interest rate risk: Possible losses arising from a change in interest rates. Measured by modified duration.
- Exchange rate risk: Variations in the exchange rate of a currency in the opposite direction than expected. Measured by the Value at Risk models (VaR).

2.2.2. Measurement.

The Basel Accords are recommendations on banking regulation and supervision issued by the Committee on Banking Supervision. Although not binding, in practice they have been adopted by over 100 countries and integrated in their local regulation. In essence, the Basel Accords are intended to ensure the ability of banks to absorb losses from the risks inherent in their activity.

In 1988 the first agreement (Basel I), in which the regulatory capital and the minimum capital that an entity should be retained to meet possible losses is established, this would represent 8% of the risk borne by the entity held.

Due to the limitations offered by the first agreement for its presumption that all partners had the same credit quality, in 2004 the second agreement on banking regulation and supervision, Basel II was published. The purpose of this agreement was to converge the risks provided by financial institutions, which were reflected in a small percentage

¹Gomez, P.; Partal, A. (2010): "Management and control of credit risk in banking." Delta University Publications. Collado-Villalba. Madrid.

(8%) of their own funds, calculated risks by supervisors. This agreement addressed three different parameters:

1. The methodology of calculation of regulatory capital, incorporating different measurement data processing methods depending on the size of the entity, setting the standard method and other advanced methods.
2. Increase the supervisory capacity and increase the power of self-evaluation of financial institutions in order to adequately reflect the risks incurred by the entity.
3. Enhance the transparency of information from financial institutions; effectively communicate the risk profile of the organization and strategies adopted to mitigate it.

When the economical recession erupted in 2007, it was noted that the financial system had gaps in terms of banking regulation and supervision. In 2010, it was announced the third agreement of the Committee on Banking Supervision, Basel III, in which steps were taken to ensure the liquidity and solvency of banks, this agreement aims to avoid volatility of entities to the cyclical nature of the economy. The implementation of Basel III will be gradually from 2013.

The objectives to be achieved with this agreement are:

1. Adequate solvency of institutions.
2. Sensitivity of capital to risk level.
3. Avoid the procyclicality of the financial system.
4. Establish a regulatory framework for liquidity.
5. Supervisory review and market information.

These objectives, according to the Banking Supervision Committee, will be achieved with the implementation of the following measures:

1. Quality increase, consistency and transparency of the capital: Basel III changes the type of instruments that can be part of tier 1² capital and Tier 2³, and eliminates the

²**Tier 1:** capital segment of the highest quality. It is composed of core capital, which consists primarily in common stocks, disclosed reserves or undistributed, and may include non-redeemable non-cumulative preference shares.

³**Tier 2:** Supplementary or Tier II capital, of lower quality than the tier1. It contains undeclared reserves, revaluation reserves, loan loss reserves, hybrid capital instruments (debt / equity) and subordinated debt.

concept of capital tier 3⁴ Toughens requirements incorporating a capital conservation buffer⁵ of 2.5% breach restricts the payment of dividends and bonuses. The increase in requirements will be gradual, following a schedule proposed by Basel.

2. Requirements to systemic institutions: Basel III introduces an additional capital requirement for financial institutions deemed systemically⁶, important, encryption between 1% and 2.5%.
3. Expansion of the risks coverage: Basel III promotes an integrated market risk and counterparty management, introduces the CVA⁷ risk linked to deterioration, increased capital requirements for exposures with derivatives and repos, and propose other measures to encourage the hiring of OTC⁸ derivatives through central counterparties
4. Limit leverage: in order to control the leverage of the financial system, Basel III introduces a tier 1 capital ratio of at least 3% exposure, which must be met in 2018.
5. Mitigation of procyclical: to reduce procyclicality of the financial system, Basel III introduces, among other measures, countercyclical capital buffer⁹ of between 0% and 2.5%, which should accumulate in the boom years for use in periods of stress.
6. Measurement and control of liquidity: among other monitoring tools, Basel III proposes two liquidity ratios: the liquidity coverage ratio (LCR), short-term and net stable funding ratio (NSFR) in the long term. Both must be greater than 100%; in its latest study on liquidity, published in April 2012, the Basel Committee noted that there was still four to meet this objective.

⁴Tier 3: tertiary capital, which includes a wider variety of instruments tier1 and 2 segments, including other subordinated issues and reserves not included in the Tier 2 segment.

⁵Capital conservation buffer: capital surcharge introduced by Basel III, equivalent to 2.5% of risk-weighted assets (RWA), which should be covered with equity commonequitytier1, which aims to ensure that institutions are able to absorb the losses from their activity in periods of stress lasting several years.

⁶Systemic Buffer: capital surcharge introduced by Basel III, estimated between 1% and 2.5% of risk-weighted assets (RWA), which must be covered by equity commonequitytier1 considered systemic entities (systemically important financial institutions, SIFIs) to ensure a greater capacity to absorb losses as a result of the biggest risks to the financial system.

⁷CVA: credit valuation adjustment (credit valuation adjustment) reflecting the counterparty risk losses in the market value of trading derivatives.

⁸OTC (overthecounter): OTC trading system through which financial instruments are traded between two parties, without the mediation of an organized market.

⁹Countercyclical buffer: capital surcharge introduced by Basel III, discretionary amount between 0% and 2.5% of risk-weighted assets (RWA), which should be covered with equity commonequitytier1, designed to mitigate procyclicality system I financial; It should accumulate during periods of credit growth and released in times of economical recession.

Implications of Basel III

The expected benefits that Basel III will bring will be focused on the stability of the financial system.

- Prevention of new economical recessions in the financial sector.
- Mitigation of procyclicality in the market.
- To improve transparency and increase confidence of investors.
- Improvement of the methodology.
- To integrate market risk and credit risk at wholesale level.

The risks that may entail implementation are:

- Economically driven up of the credit which would lead to a decrease in lending.
- Short-term liquidity decrease and the risk that entails public information about excessive volatility in the markets.
- Economically driven up of certain businesses.
- Discouraging investments in financial institutions and insurance companies

Considering the benefits and risks that could take the banking system for the implementation of this legislation, there is a consensus in financial institutions that the benefits outweigh the risks in the adoption of Basel III.

Financial entities that are investors in large projects, regulatory capital will be higher than others, due to its exposure to risk in these operations.

The evaluation of major projects by banks usually follows a protocol and gets several opinions from several departments. First is the investment department which analyses the investment required and the expected cash flows projected over the period. It analyses the potential risks that may be incurred each project phase and how to mitigate them. Once this study is made, the report is issued in position of financing the project. Second is the risk department who analyzes the operation including, besides the financial costs of funding. The department issues a report in turn setting out the risk mitigation if the financing proposal is positive or negative to finance, derived by the non-coverage of economic risks involved in carrying out such project.

In academic performance by financial institutions to the non-consideration of the possible effects the project on environmental or social terms is criticised and focusing only on purely economic aspects (Fernández, M. A.; Muñoz, M. J; Ferrero, I; 2014). Proposals to channel these risks are being studied and weigh them and introduce them to the appraisal of projects, although it is still difficult to quantify them.

2.3. Non-financial risks

2.3.1. Definition

Consider all risks holistically and manage them in a sustainable way has been proposed as a solution for changing the model, incorporating non-financial decision-making variables and transparent information systems. Under this scenario, the non-financial risk management and assessment, called FASG risk (financial, social, environmental and corporate governance) is of great importance for the survival of companies in the current financial environment (Fernández-Izquierdo et al., 2014)

This idea can be extrapolated to the assessment of investment projects. The evaluation of non-financial risks of a major project is as important as the analysis of financial risks resulting from it. The result of analysis of the environmental impact of a project of this nature, it is vital to perform it. A large project that does not respect the environment may come to be economically broken, i.e., it cannot be expected profits if the project's impact on the environment is so strong that do not perform economic activity as initially thought, think about the Castor project. This project was frustrated when the effect of its activities on the environment truncated the flows expected for its performance. The scope of earthquakes recorded in mid-2013, not "expected" in the project evaluation made that investment, both public and private, to be not viable. The severity of the above was not predicted in sufficient measure to evaluate the project, this made investors not only made cost-effective investments, but these are in a critical situation awaiting judgments. This is a clear example of the importance of taking into account nonfinancial factors in the evaluation of major projects.

According to the Law 21/2013, of December 9, environmental assessment, "Environmental assessment is essential for the protection of the environment. It facilitates the incorporation of sustainability criteria in making strategic decisions, through the evaluation of plans and programs. And through project evaluation, ensure adequate prevention of specific environmental impacts that may arise, while establishing effective mechanisms for correction or compensation".

2.3.2. Measurement.

There are voluntary measures governing the modus operandi of financial institutions in environmental, social and corporate governance matters. Below the Equator Principles and very briefly the principles of Responsible Investment are quoted.

Equator Principles¹⁰:

Equator principles are guidelines that are adopted voluntarily depending on the policies of the International Finance Corporation (IFC), an agency of the World Bank, to ensure that social and environmental issues receive full attention in the business of financing projects especially in developing countries.

The Equator Principles are a guide in which the financial institutions can take refuge to determine to evaluate and to manage the environmental and social risks in the projects. These serve as support for the decision making of social responsibility.

The Equator Principles applies globally, to all industry sectors and to four financial products 1) Project Finance Advisory Services 2) Project Finance 3) Project-Related Corporate Loans and 4) Bridge Loans. The relevant thresholds and criteria for application are described in detail in the Scope section of the Equator Principles.

Currently 80 Equator Principles Financial Institutions (EPFIs) in 35 countries have officially adopted the EPs, covering over 70 percent of international Project Finance debt in emerging markets (web equator principles; 2015).

The financial institutions adhered to the principles of equator allocate social and environmental politics in the forms and guidelines to fund projects. In this way, they do not provide the finance of projects that do not fulfil the Equator Principles.

The four products described to continuation are supported by the Equator Principles when supporting a new Project.

1. Project Finance Advisory Services where total Project capital costs are US\$10 million or more.
2. Project Finance with total Project capital costs of US\$10 million or more.
3. Project-Related Corporate Loans
4. Bridge Loans

The Equator Principles Financial Institutions (EPFI) will only provide Project Finance and Project-Related Corporate Loans to Projects that meet the requirements of Principles 1-10.

¹⁰ THE EQUATOR PRINCIPLES JUNE 2013 www.equator-principles.com

STATEMENT OF PRINCIPLES

Principle 1: Review and Categorisation

The Financial Institution Equator Principles categorise, under the environmental and social risks, the project. This categorization is based on the process of environmental and social categorization of the International Finance Corporation (IFC). The categories are:

Category A – Projects with high environmental and social risks and/or catastrophic impacts.

Category B – Projects with limited environmental and social terms risks and / or reduced impacts identified in a specific place, solvable and disposal; and

Category C – Projects with environmental and social risk and / or impacts low or zero.

Principle 2: Environmental and Social Assessment

For projects categorized as A and B, the Financial Institution Equator Principles require the customer an assessment of the risks and social and environmental impacts of the proposed project. The documentation of the assessment should address the solutions to the above impacts, in proportion to the nature and scale of the proposed project.

The documentation of the assessment prepared by customers, consultants or outside experts will be an assessment and adjusted accurately and fairly the risks and environmental and social impacts.

Principle 3: Applicable Environmental and Social Standards

The evaluation process of the project should avail, in the first place, to the laws, regulations and permits that pertain to environmental and social issues of the country.

Principle 4: Environmental and Social Management System and Equator Principles Action Plan

Projects belonging to categories A and B, the Financial Institution Equator Principles requested customer to develop and maintain an Environmental Management System and Social (ESMS), a Plan of Environmental and Social Management (LDCs). It shall be prepared by the client to address the issues raised in the evaluation process and introduce appropriate measures to comply with the rules applicable actions. When standards are not met at the request of the Financial Institution Equator Principles, the client and the entity develop a plan of action Principles of Ecuador (AP). The Equator Principles AP attempt to address the gaps and responsibilities to meet the requirements of the Equator Principles bank following the rules.

Principle 5: Stakeholder Engagement

The Financial Institution Equator Principles for projects characterized by A and B, ask the client effectively clarify Stakeholder Engagement as a continuing course in a structured way and according to the affected communities and other stakeholders.

Principle 6: Grievance Mechanism

Projects belonging to categories A and B Financial Institution Equator Principles request the customer as part of the ESMS provide a system to receive complaints outlined and solve problems and complaints in environmental and social terms relating to the project.

*Principle 7: Independent Review**Project Finance*

For projects of category A and category B, an independent environmental and social consultant, who is not directly related to the client, will perform a self review assessment documentation including the ESMS The ESMS, and information about the process Stakeholder Engagement with the aim of proper action the Financial Institution Equator Principles, and assessing compliance with the Principles of Equator.

The independent environmental and social consultant will propose or give an opinion on the proper management of the Equator Principles AP and will conduct the project to comply with the Principles of Equator, or prove when compliance is not possible.

Principle 8: Covenants

An important aspect of the Equator Principles is the inclusion of agreements linked to compliance. In all projects, financing documentation will be included pact customer to comply with the laws, regulations and environmental and social permits, the country of origin.

Furthermore for all Category A and Category B Projects, the client will covenant the financial documentation:

- a) To comply with the ESMPs and Equator Principles AP (where applicable) during the construction and operation of the Project in all material respects; and
- b) to provide periodic reports in a format agreed with the Financial Institution Equator Principles prepared by in-house staff or third party experts, that
 - i. Document compliance with the ESMPs and Equator Principles AP, and
 - ii. Provide representation of compliance with relevant local, state and host country environmental and social laws, regulations and permits; and
- c) To decommission the facilities, where applicable and appropriate, in accordance with an agreed decommissioning plan.

If a customer is not meeting the environmental and social commitments, the Financial Institution Equator Principles shall draw corrective measures with the client and will transform the project to the extent possible meets the requirements. If the customer can not ensure compliance within the stipulated period, the Financial Institution Equator Principles reserves the right to exercise remedies as it considers relevant.

Principle 9: Independent Monitoring and Reporting

Project Finance

The Financial Institution Equator Principles will request for all the projects of the Category A and, as appropriate, the Category B, the existence of a Consultor Acclimatises and Social Independent that verify the information of follow-up that would have to be shared with the EPFI to evaluate if the project fulfils with the Equator

Principles and guarantee the continuous follow-up after the Financial Closing and during the life of the loan.

Principle 10: Reporting and Transparency

Client Reporting Requirements

Of additional form to the requirements of information established in the principle five, require the presentation of reports by part of the customer for projects of Category A, and in his case, the projects of Category B:

- A summary of the Evaluation of Environmental and social Impact accessible and on-line, guaranteed by the customer.
- The customer will inform publicly of the levels of broadcasts combined of Scope 1 and Scope 2 during the phase of operation, in the case of Projects that issue more than 100.000 annual tonnes of equivalent CO2 annually.

EPFI Reporting Requirements

The EPFI will report publicly, at least annually, on transactions that have reached Financial Close and on its Equator Principles implementation processes and experience, taking into account appropriate confidentiality considerations.

CaixaBank aims that these projects are developed in a socially responsible and apply best environmental practices available. Those projects whose risks and potential impacts, according to a first analysis, are high and irreversible and It not expected to be able to establish a viable plan of action, or that contravene CaixaBank's corporate values are not taken into consideration and, therefore, a deeper evaluation of them is performed. The company rejects in advance for your participation in the financing of such projects. Throughout 2014 CaixaBank 9 projects evaluated based on the Equator Principles, whose total investment was 2,506 million Euros and in which CaixaBank has participated more 270 million Euros. One was categorized as A, B and four at the other four, as C.¹¹

Table 2: Table Number of projects funded in 2014

By Category		By Sector		By region		By designation	
A	1	Infrastructures	2	Europe	8	Designated country	7

¹¹ www.caixabank.com

B	4	Oil & Gas	2	America	11	Country undesignated	2
C	4	Wind Power	2				
		Real estate and tourism	3				

Source: www.caixabank.com

In 2011, as part of its commitment to the environment, CaixaBank launched an internal procedure for assessing the social and environmental risks in those exceeding seven million, whose purpose is the investment syndicate operations. In 2014 have been revised five operations, the total amount was more than 360¹² million euros. Of these, two were categorized as B and the other three as C.

¹² www.caixabank.com

Principles for Responsible Investment (PRI)¹³:

The principles of responsible investment were created in 2005 by a group of great institutional investors globally, sponsored by the United Nations, drafted as a voluntary initiative to boost investors focus on sustainable and responsible investment. Although these principles are not a risk measurement standard for large projects, could provide guidance for determining certain lines of action to follow in the assessment of non-financial risks of large projects.

The importance of investor in environmental, social and governance factors (ESG), the long-term security and stability of the market as a whole, is recognized in the responsible investment approach. It recognizes that generating sustainable returns in the long term depends on the stability in the operation asserting itself in good governance through social, environmental and economic systems. It is promoted by the growing recognition by the financial community for research, evaluation and analysis of environmental, social and good governance aspects, as a fundamental part in the estimation of value and performance in the medium and long term. This analysis should report on asset allocation, stock selection, portfolio development, responsibility and shareholder vote. Responsible investment requires investors to expand the vision, accepting that other risks and opportunities in investment, with the objective of capital structure in alignment with the interests short- and long-term customers and beneficiaries.

THE SIXTH PRINCIPLES

Institutional investors have an obligation to provide performances beneficial long-term customers. In the administrator function, be believe that corporate governance environmental and social aspects affect the performance of investment portfolios, through companies, sectors, regions or asset classes. Adherence to these principles provides investors with broader objectives of society. In response to the managers responsibilities institutional investors commit to the following:

Principle 1: To incorporate ESG issues into investment analysis and decision-making processes.

Principle 2: Active owners and incorporate ESG issues into our ownership policies and practices.

¹³ The Principles Responsible investment www.unpri.org

Principle 3: Seek appropriate disclosure on ESG issues by the entities in which invest.

Principle 4: To promote acceptance and implementation of the Principles within the investment industry

Principle 5: To work together to enhance our effectiveness in implementing the Principles.

Principle 6: To be each report on our activities and progress towards implementing the Principles.

Principles for Sustainable Insurance

Prepared by the Finance Initiative United Nations Environment Programme, the Principles provide a framework for the insurance industry worldwide in an attempt to cope with the risks and environmental, social and governance opportunities.

Principle 1: Integrate into the decision-making process relevant environmental, social and governance issues (ESG issues) to the insurance business.

Principle 2: Work with clients and partners to raise awareness about the environmental, social and governance issues, manage risk and develop solutions.

Principle 3. Collaborate with governments, regulators and other key interest groups, in order to promote broad action across society on environmental, social and governance issues.

Principle 4: Accountability and show transparency, disclosing publicly and periodically progress in implementing the Principles.

While their ultimate goal is not assess risks on large projects, they could be considered as guidelines to consider certain lines of action in measuring non-financial risks on major projects.

3. METHODOLOGY

The present study tries to respond to the objective of the work through a meta-analysis. The meta-analysis is an established methodology applied in the field of finance. The objective of this technique is to guide rigorous, systematic and quantitative review of works addressing a problem in finance. It provides effectiveness to overload information in the area of study.

Meta-analysis are systematic and objective reviews that are developed through a series of stages:

a) Development of the problem

In the assessment of major projects there are no criteria to quantitatively introduce non-financial risks. Can the feasibility of a major project be assessed only considering financial risks?

b) Phases of the review

Firstly we have considered the way in which major projects are assessed at present and subsequently conducted a review of the literature on research carried out to introduce non-financial criteria in the traditional risk assessment.

c) Source of information

To address this accumulation of knowledge different sources have been used: academic publications from the database of the Jaume I University and Google Academic, regulation on socially responsible investment, the Equator Principles and official legislation.

This technique has advantages such as:

- The efficient handling of large amount of information
- Other researchers may use the same meta-analysis
- Analysing the different results of the investigations on the same issue.

However there are some limitations such as:

- The information collected is biased
- You may only find those data that are significant to the author.
- The accumulated information must be homogenized to draw conclusions and for that purpose specific criteria must be set up.

4. RESULTS

4.1. Risk analysis in large investment projects

Each phase of the Project Finance brings about different types of risks, identifying and analysing each of these is very important to find ways of more effective mitigation and make project financing more beneficial. Although each Project Finance may incur different risks, down below the most common ones are referenced attending the publication of Francisco Ramirez (2014).

Engineering and construction risks

- Risk of delay or abandonment of the constructor
- Risk of additional costs in the price of the investment previously agreed
- Risk of technological design used in construction
- Risk of infrastructure, land and insufficient transport
- Risk in the subsoil quality on which is constructed

Risks of exploitation and operation of the project

- Risk of falling forecasted production
- Operational risk over cost and technical obsolescence
- Risk of transport in the cost of products
- Project Risk Management

Market risks

- Risk of goods and services provision
- Quality risk of consumed raw material
- Risk of low demand for the product or service produced by the project

Financial risks of the project

- Financial risks of shareholders, promoters and participants
 - risk of neglect or disbursement of own funds.
 - Risk of limited commitment from shareholders guaranteeing funders.
- Financial risks of the Project and financial banker
 - Risk arising from interest rate movements and inflation
 - Risk arising from movements in exchange rates

Political risks

- Risk of expropriation or nationalization
- Country risk
- Risk of currency convertibility
- Municipal risk, licenses and permission
- Regulatory risk
- Tax risk

Risks of force majeure: arising from unforeseen situations.

Legal risks and documentaries: from different legal systems.

Environmental risks

Although some of the risks mentioned above can be deleted during the course of the project and obtaining cash flows, there are some of them that should be reduced by insurance contracts, securitization and financial derivatives.

Once the risks identified, to assess the project Finance expected cash flows are projected to analyse the economic viability of the project.

After the economic study and prediction of expected cash flows, the financial evaluation of the project is carried out, for this purpose different probability scenarios (probable, pessimistic and optimistic) are defined by applying to these financial indicators analysis (Net Present Value and Internal Return Rate). Also, a sensitivity analysis is carried out on the economic study and taking into account the effect on the financial indicators. It consists on altering one of the following variables: investment costs, interest rates, inflation, increase or decrease in costs and relevant incomes in the project, taxes, etc. Its effect on the economic and financial viability will be assessed.

Once analysed as described above, the investment project is accepted or rejected. If the Net Present Value is positive, it is accepted and if it is negative, it is rejected.

4.2. Associated non-financial risk analysis

The literature indicates that non-financial risks should be taken into account in the valuation of a major project. There are several studies that support the inclusion of environmental, social and governance risks in the evaluation.

Exhibit 2: FESG Risks Literature

Academic papers, Reports	Author / Year	Risks
"FESG Risk"	Fernández-Izquierdo et al. (2014)	Financial, Environmental, Social, Governance
"Corporate Environmental Management and Credit Risk"	Rob Bauer and Daniel Hann (2011)	Environmental
"Employee Relations and Credit Risk"	Bauera, Derwallaand Hann (2009)	Governance
"Risk assessment in practice" - COSO	Dr. Patchin Curtis and Mark Carey - Deloitte & Touche LLP (2012)	Enterprise-wide risk management (ERM)

Source: "own creation"

Fernández-Izquierdo et al. 2014 propose the inclusion of environmental, social and governance issues for the assessment of non-financial risks in organizations. Thus, they present a methodological approach to risk measurement to provide a comprehensive management thereof and ensure the risk assessment of the four pillars (FESG). Specifically it proposes a matrix for assessing such risks which distributes the risks depending on frequency and consequence. The aim is that companies are in a risk area lower to 5 in all risks. Some of the risks to consider are financial, environmental, social and governance risks.

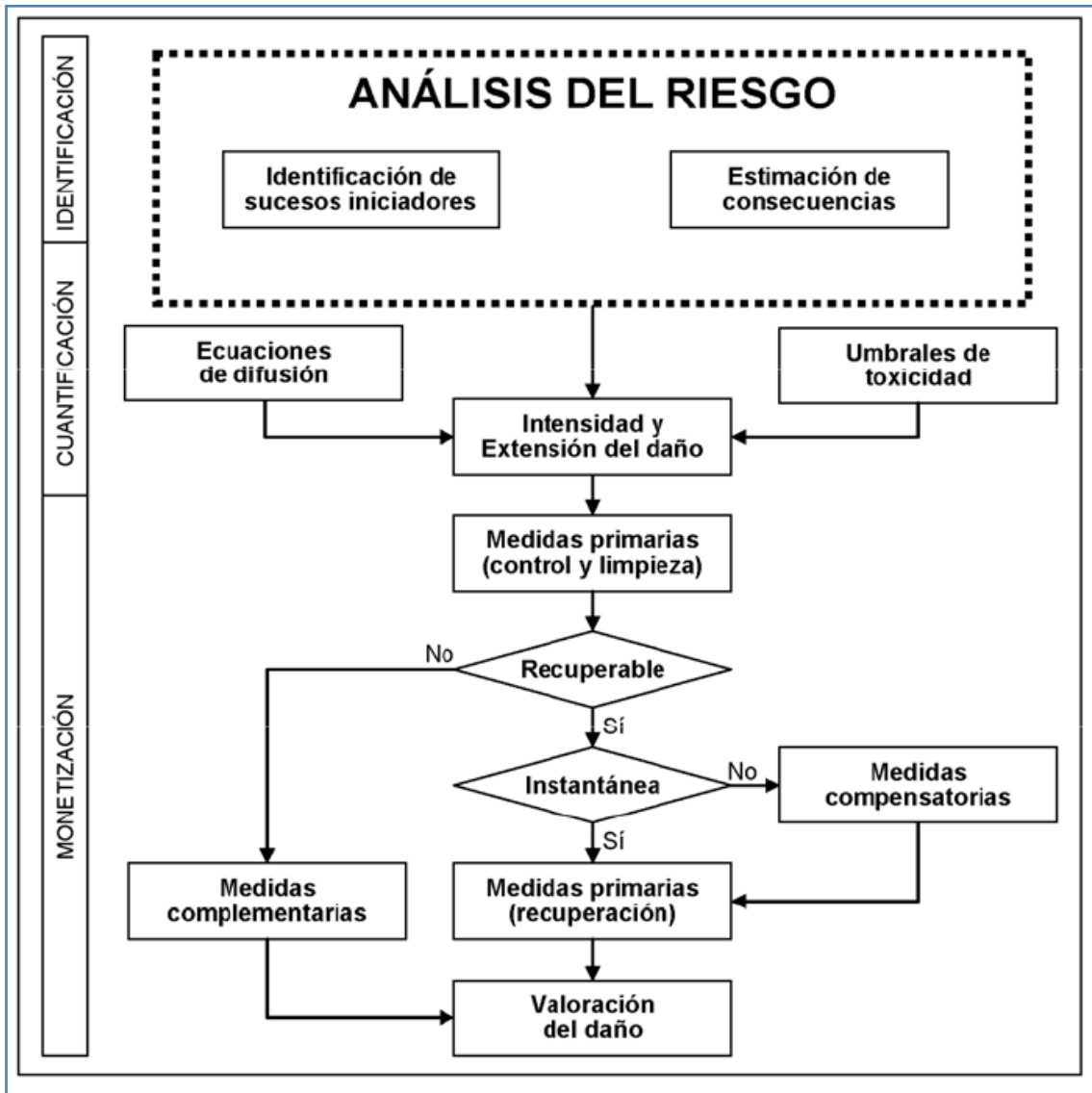
Rob Bauer and Daniel Hann (2011) discuss the implications of environmental offenses in the risk of loans to corporate borrowers. The latter incur penalties and fines for the damage they cause and the effect bonds investors who invest in them getting lower returns for their investments. This could demonstrate the need to measure the risk of malpractice in financial institutions.

Research carried out by Bauera, Derwalla and Hann (2009) provides wide evidence that the management of human capital influences the credit risk of the company. Companies with strong employee relations have a lower cost of debt financing, higher credit ratings and lower specific risk of the company.

On the other hand, certain standards have directions on how to assess non-financial risks in organizations. These guidelines could be extrapolated for FASG risk measurement on major projects.

Thus, for instance, for environmental risk assessment, the UNE 150008 2008 standard on Evaluation of environmental risks recommends a methodology for estimating future environmental damage assessments. The amount of damage is estimated regardless of the probability that the risk scenario has.

Exhibit 3: Methodological Diagram



Source: "UNE 150008 2008 standard"

Particularly it establishes the following steps:

1. Damage identification.

The risk is identified in a matrix formed by damage receivers¹⁴ and diffusion means such as air, water and soil. In the situation where the recovery of the receiver is not deemed possible, environmental services provided by the affected receivers¹⁵ are identified.

¹⁴Receiver's list: Directive 2004/35/CE of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage.(ELD): soil, water, wild species and ecosystems.

¹⁵ Affected receiver's list: Costanza et al., 1997 ; Millennium Ecosystem Assessment, 2006

2. Damage quantifying

This is developed by identifying their intensity, extent and timing.

The European Technical Guide for Risk Assessment (TGD) considers three kinds of effects although the process of evolution, the sharp class difference between lethal and sharp.

- Lethal: 100% loss of the receiver. It is applied in cases where the total loss of the receiver is expected;
- Sharp: 50% loss of the receiver. When the TGD results expects sharp effects and in cases of partial loss but intense in the receiver.
- Chronic: loss of between 10% and 20% of the receiver. The long-term effects involve a loss of functions that can be equivalent to that range of receiver loss; also it is applied in cases of rare direct losses of the receiver;
- Potential: loss of between 1% and 2% of the receiver. Quantification comes from the TGD, the values in 10% of chronic; this class is used, also, to classify the scenarios that produce certain effects but hardly measurable on the receiver.

The extension is the number of affected receiver, and can be determined by setting the threshold of toxicity in the receiver of the pollution source, the amount mobilized in this stage, and pollutant diffusion equations used in the media.

The timing is estimated based on the duration and reversibility of the damage.

3. Damage monetization.

When environmental damage on the receiver is immediately recoverable to their pre-injury state, only need to add the standard cost recovery of the receiver.

In the event that the ecosystem is recoverable, but not immediately, it must be estimated an additional cost of primary measures, which should compensate for the time that the recovered receiver fails in the performance of all functions that used to perform before damage. The horizon can be set in the age of sexual maturity of the most characteristic species of the ecosystem and can use a discount rate of Social rate of time preference in Spain from 1% to 2%..

When the receiver is not recoverable, next step is to estimate the value of complementary measures, which would correspond to the social value of natural assets damaged.

Moreover, as already mentioned in the work, adhering to the Equator Principles of some banks, means they have to assess the environmental impacts of projects. This assessment is mandatory if the total capital costs of the project are 10 million dollars or more and are considered as category A or B, as mentioned in paragraph 2.3.2 of this report. Adherence to these principles is voluntary for bank entities.

In the example, Castor, referenced earlier in this case report, the most important aspects that should have been foreseen are the environment, in particular the high probability of earthquakes in the geographical area.

The amount of the Castor Project amounted to 1,536¹⁶ million Euros, of which 1,400 million was intended to capture by issuing debt rated as BBB+ according to the Fitch rating agency, and BBB according to Standard and Poor's (S & P). Among the financial institutions that participated was the Santander bank, which is adhered to the Equator Principles.

Everything indicated that this project should have a special environmental impact assessment; however, the European Parliament¹⁷ believes that the risk assessment in Castor project was disastrous by not taking into consideration the increased seismic activity associated with the injection of gas.

4.3. Integration of financial and non-financial risks.

By extrapolating the measurement criteria of the UNE 150008 2008 applied to projects, integration in the valuation of the Project Finance of financial and non-financial aspects would be possible by including damage monetization referred to in paragraph 4.2., in the plan of foreseen costs. Projecting damage throughout the project life and differentiating depending on the phase in which the project is located.

Following the above analysis the following proposal for quantifying non-financial risks is performed. The methodology for quantifying non-financial risks consists on the following aspects:

1. Firstly, damage in each of the phases of the Project is identified.
 - Effect on the population's health by the emission of waste.
 - Adverse consequences on natural resources.
 - Alteration of the landscape value of the area of implementation.
 - Fuel or oil spill.

¹⁶ News 26.07.2013 periódico Expansión newspaper

¹⁷ News 01.05.2015 La Voz de Galicia newspaper.

- Erosion and sedimentation of rivers and lakes.
 - Air and soil pollution
 - Agricultural land wearing.
2. The extent of damage is quantified. In the area of UNE 15008 semi quantitative allocation is performed based on: probability of occurrence (probability / frequency) and estimation of consequences (consequence / impact), identifying risk in a matrix.

Exhibit 4: Risk matrix

Likelihood of occurrence	<i>Frequent (5)</i>	5	10	15	20	25
	<i>Likely (4)</i>	4	8	12	16	20
	<i>Possible (3)</i>	3	6	9	12	15
	<i>Unlikely (2)</i>	2	4	6	8	10
	<i>Rare (1)</i>	1	2	3	4	5
		<i>Insignificant (1)</i>	<i>Minor (2)</i>	<i>Moderate (3)</i>	<i>Major (4)</i>	<i>Catastrophic (5)</i>
		Consequence				

- required level of risk
- unwanted risk level
- risk level pass limits
- unacceptable risk

Source: "own creation"

In phase of damage monetization, whether this is in the area of the grid in which the level of risk is unacceptable, that is, the environmental damage is not recoverable; the value of the cost would correspond to the social value of natural assets damaged.

In the event that the level of risk exceeds tolerable limits, which means that the damage is recoverable but not immediately, the estimated cost of recovery would be standard plus an increase of 1% to 2% (Social Rate of Preferences in Spain).

When environmental damage corresponds to a level of risk tolerated but not desired, it is deemed that the damage is immediately recoverable and only remains to add the standard cost recovery.

Once the measurement and quantification of non-financial risks is obtained, they are integrated in the process of traditional assessment of Project Finance as follows:

Table 3: Valuation Project Finance

FORESEEN INCOME
-FORESEEN EXPENSE
Maintenance
Foreseen extras
Financial cost
Non-financial costs
PROFIT BEFORE AMORTIZATION
- AMORTIZATION
PROFIT BEFORE TAXES
TAXES
NET CASH FLOW

Source: "own creation"

Thus, the expected cash flows of the Project Finance would be influenced by the increase in costs. It results in a favorable or unfavorable criterion for project implementation decision, and depending on the environmental risk, including the implementation of this.

5. CONCLUSIONS

Valuation of non-financial risks, especially environmental ones in Project Finance should be mandatory and not merely voluntary on the part of investors. Not only are significant impacts on financial results but also the importance of assessing the potential environmental damage. It means development of the project and that investors get higher returns or incur heavy losses.

The struggle of wanting to include non-financial risks in the processes of decision does not imply that major projects are not carried out and as a result the expected profitability of these do not give, but the inclusion of these risks seeks maximum efficiency in the assessment and carry out projects that can really provide long-term financial stability and investor returns.

This project reviews the literature on the integration of non-financial variables in measuring risks qualitatively, and a criterion is provided to assess the potential environmental damage incurred by the project, introducing these in the assessment process Project Finance in the traditional financial model.

Is relevant the contribution of this work to the professional field by providing an assessment of the Project Finance less biased. In the academic field it widens literature in this field of study. The valuation by the method established in this study has limitations such as the estimated value of the damage, subjectivity to evaluate it and there would be a large percentage of projects that would not be funded.

In order to prepare the work, knowledge acquired in previous subjects studied in the degree has been a great support such as Assessment of financial operations, Financial management and particularly Bank management.

6. BIBLIOGRAPHY

- Gomez, P.; Partal, A. (2010): "Gestión y control del riesgo de crédito en la banca". Delta Publicaciones Universitarias. Collado-Villalba. Madrid.
- Martínez Paricio, I. "Definición y Cuantificación de los Riesgos Financieros" - Global Risk Management, BBVA
- Carazo, J.L.; Guerra, R.; Izena, M.; Fabios, J.; Holgado, J.; Carnicero, C.; Leis, D.; Enríquez, H. "Convención Impactos de BIS III en la Región" – Management Solutions
- Law 21/2013 - Boletín Oficial del Estado (BOE) number 296
- The Equator Principles June 2013, [on-line web] <<http://www.equator-principles.com>> [Consult: 08-04-2015]
- The Principles Responsible investment [on-line web] <<http://www.unpri.org>> [Consult: 11-04-2015]
- Principios de sostenibilidad en Seguros (2012) Iniciativa Financiera del Programa de las Naciones Unidas para el Medio Ambiente (UNEP FI)
- UNE 150008 2008 standard - Asociación Española de Normalización y Certificación, AENOR
- Badia, D.; Morán, C. (26 July 2013) <<http://www.expansion.com/2013/07/26/empresas/inmobiliario/1374839043.html>> [Consult: 01-05-2015]
- Estrasburgo / EFE (01 May 2015) <http://www.lavozdegalicia.es/noticia/sociedad/2015/05/01/parlamento-europeo- cree-desastrosa-evaluacion-riesgos-castor/0003_201505G1P28991.htm> [Consult: 01-05-2015]
- Fernández, M. A.; Muñoz, M. J; Ferrero, I. "Comprehensive Management and Financial and Non-financial Risk Control to Overcome the Business Crisis". European Company Law 11, no. 2 (2014): 81–85.
- Hoepner, A.; Rezac, M.; Siegl, S. (2014) "Does pension funds' fiduciary duty prohibit the integration of environmental responsibility criteria in investment processes?" University of St Andrews

- Rob Bauer, R.; Jeroen Derwall, J.; Hann D. (2009) “Employee Relations and Credit Risk” Maastricht University; Tilburg University.
- Hörter, S.; Mader, W.; Menzinger, B. (2010) “E.S.G. Risk Factors in a Portfolio Context” Copyright of risklab GmbH.
- Deumes, R. (2008) “Corporate Risk Reporting” Maastricht University
- Bauer, R.; Hann D. (2010) “Corporate Environmental Management and Credit Risk” Maastricht University.
- González Torrijos, J. (2007) “La financiación de la colaboración público-privada: El «Project Finance»” BBVA.
- Makajic, D.; Jednak, S.; Benkovic, S.; Poznanic, V. (2011) “Project finance risk evaluation of the Electric power industry of Serbia” University of Belgrade.
- Curtis, P. and Carey M.- Deloitte & Touche LLP (2012) “Risk assessment in practice” - Committee of Sponsoring Organizations of the Treadway Commission (COSO)

