Towards a theoretical foundation of Project Finance and its practice in South Africa

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ABSTRACT

The academic research into Project Finance lags far behind the practice of it. Project Finance, with limited or non recourse debt as its defining characteristic, has been growing tremendously since 2001 and is set to grow even further. This is due to the massive spend in infrastructure both globally and in South Africa, the need for private sector involvement and the limited capacity of corporations' balance sheets to fund such projects. Given this setting, this research aims to act as a catalyst for the development of a theoretical foundation of Project Finance in South Africa and to encourage further research.

There were two phases to the research. The first phase consisted of an analysis of twenty two case studies on international projects that have used Project Finance, with the aim of extracting theories, principles and lessons that can be used to form a theory base. The second phase consisted of sixteen interviews with South African Project Finance industry experts, based on the theory from phase one, with the aim of exploring the current state of South African Project Finance.

The first phase resulted in a broad description of the theory of Project Finance that can be used as an introduction to Project Finance or as a base for further research. The second phase produced a portrayal of South African Project Finance as it relates to the theory with specific recommendations for further research into Project Finance in South Africa.

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other university. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Signed: _____

Date: 13 November 2008

"We should be careful to get out of an experience only the wisdom that is in it."

Mark Twain, 1894

DEDICATION

To my father, a true gentleman and role model

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1. CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1 INTRODUCTION

This chapter sets out the background for the main research problem, that research into Project Finance lags far behind the practice of it (Esty, 2004). The context for Project Finance is global and South African infrastructure spend, which is explored upfront. A brief history of Project Finance is then given followed by a look at the current state of and future outlook for Project Finance. Project Finance is then defined demonstrating how it relates to infrastructure and why there is a need for a theoretical foundation of Project Finance

1.2 GLOBAL INFRASTRUCTURE SPEND

US$16 trillion will be spent globally on energy infrastructure between 2001 and 2030 amounting to 4% of global GDP during that period (International Energy Agency, 2003). This number excludes additional infrastructure expenditure on roads, railways, water works and other areas that will be needed to sustain the demand for infrastructure that globalisation, democratisation and the growth of the global economy is driving.

Following a decline in infrastructure spending, that started in the late 1990's and lasted until 2003, the World Bank has again begun to view infrastructure lending as the centre of its agenda. One of the main reasons for this is infrastructure's

ability to enable growth and poverty reduction. The growth in global infrastructure spending over the past four decades has been driven mainly by urbanisation. Ninety percent of global population growth since the 1970's has occurred in urban areas and the global urban population more than doubled from 1970 to 2000. More specifically this urbanisation has created a demand for transport systems, sanitation infrastructure, energy as well as other needs (Infrastructure Network, 2006) Infrastructure is therefore a critical part of developing economies where urbanisation is a dominant feature of a developing economy.

1.3 SOUTH AFRICAN INFRASTRUCTURE SPEND

South Africa is one of the world's developing economies with plans for massive infrastructure spend. The South African Government's plan to spend ZAR416 billion on infrastructure was planned to put the gross fixed capital formation ratio, at 18,4% of Gross Domestic Product (GDP) in 2007 (Manuel, 2008). In the 2008 Budget this figure rose to 21% and was set to rise to 24% by 2010 (Duncan, 2008).

The key players in this spend include Eskom, Transnet and SANRAL.

1.3.1 ESKOM

Eskom is the largest producer of electricity in Africa and supplies 95% of South Africa's Electricity. It is one of the top ten electricity utilities in the world, by

generation capacity, with over 38.744 Gigawatts (GW) in net maximum capacity. Eskom plans to add 22 GW to this amount by 2017 which has seen it embark on an estimated ZAR343 billion spend over the period from 2008 to 2013 on the electrical power infrastructure while its total assets amount to only ZAR171 billion (Eskom, 2008).

1.3.2 TRANSNET

Transnet is the South African parastatal that operates ports, railways and pipelines. Overall ZAR160 billion will be spent on transport infrastructure in South Africa (Ndaba, 2008). This includes Transnet's ZAR80.3 billion, ZAR36 billion of which will need to be funded from external sources (Transnet, 2008).

1.3.3 SANRAL

The South Africa National Roads Agency Limited (SANRAL) operates both toll and non-toll roads. It is currently managing a ZAR23 billion project to upgrade 120km of Freeways in the Gauteng Province. While the non-toll roads will be funded through government grants the Toll roads are funded by the capital markets (SANRAL, 2008).

1.4 PROJECT FINANCE AS A TOOL TO ASSIST SOUTH AFRICAN INFRASTRUCTURE DEVELOPMENT

Given the scale of the spend that will take place both globally and in South Africa and the strain which current State Owned Enterprises' balance sheets are experiencing, much of the financing will need to be done on an off balance sheet and possibly, project basis. This may entail the formation of a new legal entity which will house the project and Project Finance methodologies will be used to finance, structure, value and manage these projects (Creamer, 2008a; 2008b).

1.5 A BRIEF HISTORY OF PROJECT FINANCE

In order to understand what Project Finance is and its importance in today's economy it is necessary to understand some of the history of Project Finance as it illustrates the role of the private sector in infrastructure funding. Prior to World War 1 major infrastructure projects such as the Suez Canal and the Trans-Siberian Railway, were funded by individual entrepreneurs and private companies. However following World War II and the need to rebuild much of Europe governments took over the responsibility for funding infrastructure development mainly using taxes.

By the 1980's economic and population growth, a debt crisis and other factors created a need to involve the private sector in building infrastructure.

Furthermore the discipline that profit brings to a project was appealing for such large ventures (IPFA, 2008).

The magnitude of these projects relative to the balance sheets of these private companies meant that conventional finance could not be used without posing a serious risk to these organisations. Project Finance therefore emerged as a way of financing projects using high leverage, extensive contracting and no or limited recourse to the balance sheets of the companies involved. Instead of lending against the assets of a company as is the case in corporate finance, lending was done against the future cash flows of an asset that was housed in a separate project company. This was especially popular for the development of many privatised power plants known as Independent Power Plants (IPP's) in the United States of America in the early 1980's

This trend has been spurred on by globalisation, privatisation and deregulation in both developed and developing countries and according to the International Project Finance Association (IPFA, 2008) "it is now increasingly recognised that the private sector can play a dynamic role in accelerating growth and development infrastructure projects." The fact that US$890 billion was invested in infrastructure projects, between 1990 and 2003, across the globe attests to this trend (Esty and Sesia, 2006).

1.6 THE CURRENT STATE OF PROJECT FINANCE: 2006 - 2008

By 2006 global Project Finance investment, including both debt and equity, had reached a historical high of US$328 billion, a 23% increase over 2005. This followed on from a massive downturn in 2001 where global investment fell by 40% year on year mainly due to the global recession that was occurring at the time. By 2006, however, bank loans for Project Finance had risen to a new high of US$181 billion, financing 541 projects and bonds of US$29 billion financing 68 projects, making $210 billion of Project Finance lending in total.

In terms of regional distribution, Western Europe counted for 34% of Project Finance lending, Asia for 16%, The Middle East, 15% and North America, 14%. All the other regions combined, including Africa, accounted for less than 7% of global Project Finance lending. However Africa had a four year compound annual growth rate (CAGR) of 40%, second only to the Middle East's 84%, mainly attributable to a low base and increases in oil and gas projects (Esty and Sesia, 2006).

2007 saw further growth in this market with lending up 17.4% to US $246.5 billion, mainly due to growth in the EMEA (Europe, Middle East and Africa) region. African Project Finance doubled to US$9.2 billion in 2007 partially due to the US$2.1 billion Ambatovy nickel-cobalt mining and processing project in Madagascar (PFI, 2008a).

During the first half of 2008 Project Finance investment continued to climb in terms of loans up to US$127.8 billion from US $103.7 in the same period the previous year. Bonds however are down nearly 50% to US$5.1 billion and there are doubts as to whether the overall growth of the market can continue given the global credit crunch and liquidity issues that existed in the market in mid 2008 (PFI, 2008b).

1.7 Future Outlook and Trends

While 2008 has seen a slow-down in the financial markets infrastructure demand is and will remain high. This includes demand for transportation, telecom, power, water and sewage and natural gas assets. This is mainly being driven by world population growth with the total population expected to reach nine billion by the year 2042, according to the US census.

The need for more innovative financing structures is also set to aid the growth of Project Finance. These include hybrid Project-corporate Finance structurings, Term-B loans (a type of bond with a back-end collateralisation and bank-like covenants) and Monoline Bonds (bonds that increase the credit rating of a project to that of the sponsor, by providing credit protection to the bond holders, and the inclusion of private equity) (Esty and Sesia, 2006).

1.8 DEFINING PROJECT FINANCE

Having established the history of Project Finance and demonstrated the market needs that lead to the rise of these financing structures it is necessary to define Project Finance.

Project Finance is easy to define conceptually, in that there are distinct characteristics which can be pointed out such as a large capital investment, a separate project company and cash flow that services the debt (Esty and Sesia, 2003a). However, in practice, when one needs to start distinguishing between Project Finance and other forms of finance it becomes apparent that there is significant overlap between these different areas.

An example of where this presented a challenge was with the Basel II accords. Basel II initially intended to impose higher risk weights on Project Finance. A consortium of various international banks was formed to challenge this by conducting a study to determine whether Project Finance loans were riskier than Corporate Finance loans. As such it was necessary to define what Project Finance was in order to conduct the comparison.

They eventually used the following definition: (Esty and Sesia, 2003a, p. 10) “a project company is a group of agreements and contracts between lenders, project sponsors and other interested parties that creates a form of business organisation that will issue a finite amount of debt on inception; will operate in a focused line of business; and, will ask that lenders look only to a specific asset

to generate cash flow as the sole source of principal and interest payments and collateral."

Professor Benjamin Esty (2004, p 213) of the Harvard Business School offers an alternative and somewhat simpler definition as follows: "Project Finance involves the creation of a legally independent project company, financed with equity from one or more sponsoring firms and non-recourse debt for the purpose of investing in a capital asset."

While these and other definitions have much in common in articulating the defining characteristics of Project Finance there are important differences between them such as:

- When the debt is issued; at inception or not,
- The nature of the business; whether it is focused or not,
- The presence of equity from sponsoring firms and
- The nature of the non-recourse debt, whether the project assets are the only assets against which the loan is taken or whether other assets or guarantees could be included.

The case studies that will be analysed in Chapter 5 will further illustrate this point. (For further definitions of Project Finance see section 2.2.1 below and the Teaching Notes for the Basel II Case study by Professor Benjamin Esty, 2003d, Exhibit TN-3, p. 27)

For the purposes of this research, being exploratory in nature as will be discussed in Chapter 3, and because all the case studies which will be analysed were written by Professor Benjamin Esty, his definition will be used.

1.9 THE NEED FOR A THEORETICAL FOUNDATION OF PROJECT FINANCE

In his article *Why Study Large Projects, an Introduction to Project Finance*, having defined Project Finance, Esty (2004, p 214) goes on to say: “Given the demand for investment and the growing importance of Project Finance as a financing tool, corporate executives, bankers, lawyers, and government officials need to understand what Project Finance is, why it creates value, and how to structure transactions that have a high probability of succeeding both operationally and financially.”

To illustrate the importance of ensuring that these projects are managed correctly: “Miller and Lessard (2000) studied 60 large engineering projects with an average size of $1 billion undertaken between 1980 and 2000. They found that almost 40% of the projects performed very badly and were either abandoned totally or restructured after experiencing some kind of financial crisis.” (Esty, 2004, p 221) Furthermore “Merrow *et al*. (1988) studied 47 ‘mega-projects’ and found that only four of them came in on budget – the average cost overrun was 88%. Of the 36 projects that had sufficient data, 26 of them (72%) failed to achieve their profit objectives” (Esty, 2004, p 221).

Given the number and size of projects that are to be completed in Africa and specifically South Africa, it is imperative that they are run as efficiently and effectively as possible. The question is then: What lessons can be learned from large international Project Finance projects for projects in Africa and South Africa and its infrastructure build programme? How can South Africa as the largest economy on the African continent use the experience of international projects to ensure that its projects achieve the set objectives?

Furthermore, research needs to be done on more specific questions such as: What are the best valuation methodologies to use when valuing a large scale project (Esty, 1999) and what is the optimal debt capacity for large Build-Own-Transfer (BOT) projects in emerging markets (Logan, 2003)?

Within South Africa Project Finance, as a conduit for non-recourse debt can play a significant role in financing the large projects that need to take place. Given the scale of investment that is needed, it is unlikely that these projects will be able to be financed against the relevant organisations' balance sheets. For example, Eskom will more than double its asset base in terms of value with the construction of two power stations. While its total assets in 2007 was ZAR143 billion, the Medupi and Kusile (previously Bravo) power stations will cost approximately ZAR78.6 billion and ZAR80 billion respectively, according to the official figures. Project Finance allows for non-recourse debt where funds are borrowed against future cash flows and secured by structured contracts, such as Power Purchase Agreements (PPA), and not secured by assets (Creamer, 2007).

As will be demonstrated in the Literature Review in Chapter 2, the practice of Project Finance is far beyond the academic research into the area on a global level. Within South Africa research into Project Finance is almost non-existent. For example, none of the top three business schools offer courses on Project Finance whether in the core or elective modules (WBS, 2008; GSB, 2008; GIBS, 2008).

1.10 RESEARCH OBJECTIVES

Given the need for infrastructure investment, new, innovative financing solutions are required. Project Finance is an area which can open up these channels. In the words of Ivor Ries, financial journalist and senior research analyst for EL & C Baillieu: "Project Finance lenders are the quintessential optimists of the banking world. Where traditional commercial bankers can only see negatives and risks, project financiers look to see what's do-able and how to manage or isolate risks" (Esty and Kane, 2002).

As established above in 1.8, the area of Project Finance is under-explored in relation to other areas of finance. Therefore, being at the beginning of the learning curve, especially in South Africa, even small improvements in theory and practice can yield large financial, social, and academic returns (Esty, 2004).

The objectives of the research are as follows:

- **Objective 1:** To develop a basic theory base of Project Finance that will be pertinent to South Africa in its infrastructure build programme. This will be done by looking to case studies of international Project Finance projects and extracting the theories, principles and lessons from each of them.

- **Objective 2:** To assess the current practise of South African Project Finance against the lessons learnt from international case studies

- **Objective 3:** To act as a catalyst for further research on Project Finance in South Africa which can focus both on Project Finance in general and on specific areas in Project Finance

1.11 SCOPE OF THE RESEARCH

While the topic of Project Finance is broad and touches on many areas within the broader areas of Finance, Risk Management and Project Management, the research will deal with the following five areas, in parallel to the five sections set out in Professor Benjamin Esty's textbook: *Modern Project Finance: A Case Book* (2006a):

1. Defining Project Finance
2. Structuring Projects
3. Valuing Projects
4. Managing Project Risk and

5. Financing Projects

The research will also be limited to the lessons that have been extrapolated from the chosen case studies. Further details on the scope of the research will be set out in the Research Methodology in Chapter 3. First, however, in the following chapter, the relevant literature will be explored in order to give the reader background to the work that has been done to date in Project Finance and to guide the structure of the research conducted.

2. CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The literature that can be found on Project Finance is somewhat sparse both globally and locally but especially in South Africa. According to Esty (2004): "Unfortunately, academic theory and research on Project Finance distantly lag the state of current practice. Additional research is clearly needed not only to guide practice, but also to refine existing finance theories and to generate new ones…The field of Project Finance is relatively unexplored territory for both empirical and theoretical research…There has been only one article directly on Project Finance published in the four leading finance journals, and not more than 15 articles in all finance journals over the past 20 years."

A review of the article titles in the four leading finance journals referred to by Esty (2004) demonstrates that this status has not changed. Only one article on Project Finance has appeared in these journals over this period and that one focuses on the movie industry (Journal of Financial Economics, 2008; Review of Financial Studies, 2008; the Journal of Finance, 2008; Journal of Financial and Quantitative Analysis, 2008).

2.2 SCOPE OF THE LITERATURE REVIEW: PART 1, PROJECT FINANCE THEORY

This literature review covers two main areas. The first is the relevant theory base of Project Finance including the definition of Project Finance. The second is the case studies that are available in this area. While all the different areas of Project Finance overlap and are interrelated, the first section of the literature review can be divided into five areas. The last four of these correspond to the four modules of Professor Benjamin Esty's *Modern Project Finance: A Case Book* (2006a).

1. Defining Project Finance;
2. Structuring Projects;
3. Valuing Projects; and
4. Managing Project Risk
5. Financing Projects.

The approach taken in this research is exploratory and therefore it is more appropriate to cover a wide range of areas within Project Finance, rather than exploring the depth of each area (See Chapter 3 for further detail). As such the Literature Review will explore the relevant theory base in as much as it relates to providing an understanding of the theory base used in the case studies in

Chapter 5. The relevant theories will, however, be explored in full in the Case Study Analysis in the second section of Chapter 5.

2.2.1 DEFINING PROJECT FINANCE

As mentioned in Chapter 1, Project Finance is a relatively new area of academic research and so while it is conceptually easy to understand, an agreed upon definition has not been formulated. The differences between definitions can vary greatly. Esty's definition cited in 1.7 above focuses on the characteristics of non-recourse debt, the creation of a specific project entity as a separate legal structure and an investment in a capital asset. However an article in the Wall Street Journal cited by Pacelle *et al*., in 2001 defined Project Finance as "a term that typically refers to money lent to build power plants and oil refineries" (Esty, 2004).

As such, the definitions and principles of Project Finance have been written on since 1980 and are set out in *Essential Elements of Project Finance* (Wynant, 1980), *Project Financing: Building Infrastructure Projects in Developing Markets* (Fitzgerald and Machlin, 2001), *Project Finance: Tools and Techniques*, (Frame, 2003) and *Principles of Project Finance* (Yescombe, 2002).

Further definitions of Project Finance can be found in the Case Study, *Basel II: Assessing the Default and Loss Characteristics of Project Finance Loans* (Esty and Sesia, 2003a) *and in the teaching notes to the case* (Esty and Sesia, 2003d). In that case it became critical to distinguish between Project and

corporate Finance in order to prove which was riskier. A list of definitions including the one that they agreed upon can be found there, in Exhibit TN 3.

2.2.2 STRUCTURING PROJECTS

The structuring of projects has been looked at by Penrose (1996) in terms of Special-Purpose Entities and in terms of the debt-equity levels by Scheinkestel (1997). Principles of managing project risk are covered in Beenhakker's book *Risk Management in Project Finance and Implementation* as well as in Delmon's *Project Finance: BOT Projects and Risk* (2005).

The corporate governance of large projects has been researched by Jensen (1993), cited by Esty (2003i), in terms of board size. Yermack has looked at board composition in terms of the independence of the board members (1996). These issues have also been looked at by Barclay and Smith (1996 and 1999), Harris and Raviv (1991) and Simpson and Avery (1995), all cited by Esty (2002b).

2.2.3 PROJECT VALUATION

There is a considerable amount that has been written on the theory of valuations. However the purpose of this section is to review only the literature on valuations that is specifically related to Project Finance. The most common ways of valuing projects is using Discounted Cash Flows (DCF), either using

Free Cash Flows (FCF) or Equity Cash Flows (ECF). However, these are "simple tools that were designed for simple applications" (Esty, 1999, p 9)

In response to this, more complex valuation techniques have been developed specifically regarding projects. Due to the large nature of the investments required, a great deal of work has been done on refining valuations. This can be done by using valuation methodologies such as Real Options Analysis, Monte Carlo Simulation and Neural Network Metamodels (Balcombe and Smith, 1999; Esty, 1999).

2.2.4 MANAGING PROJECT RISK

Risk is also an area that is well developed in finance theory and is not specific to Project Finance. As such this will not be dealt with in depth. Concerning managing project risk, this has been dealt with by the International Finance Corporation (1999), Miller and Lessard (2000) and Zenner (2001).

2.2.5 FINANCING PROJECTS

Capital Structure is a definitive characteristic of Project Finance and is a main feature of the lessons and principles learnt in the case studies in Chapters Five and Six. As such, this area is explored in somewhat more depth than the others.

Various techniques and instruments for financing projects have been looked at including: syndicated loans (Bavaria, 2002), project bonds (Dailami and

Hauswald, 2003) and debt equity structures (Harvin, Hermans, McDermott, and Monnier, 2006). Financing has also been looked at from different points of view including the institutional investor (Devapriya and Alfen, 2003), private financing (Fishbein and Babar, 1996) and commercial banks (Forrester, 1995).

The capital structure of firms and project entities is well developed in financial theory. Within this there are a number of theories that explain the capital structure of a project and explore why projects have highly leveraged capital structures, why specific types of capital are used, why capital is raised in a specific sequence and what the determinants of capital structure are? (Esty 2003d; 2003i)

The theories of capital structure are not mutually exclusive as reality combines all of the imperfections in differing amounts, times and settings. Agency Theories of capital structure deal with minimising agency costs. Agency based theories of capital structure include the Contracting Theory of Capital Structure and deals with the target Capital Structure. According to Modigliani and Miller capital structure is irrelevant while Esty (2003i) demonstrates that in Project Finance capital structure is an integral part of a project and certainly does matter. Another agency based theory, Static Trade-off Theory, looks at taxes and financial distress costs (probability and cost of distress) as determinants of capital structure.

Asymmetric Information Theories include Myers' Pecking Order theory which says that firms prefer the least information-intensive form of capital available

and therefore private debt precedes public debt; And Ross' Signalling Theory, which says that firms issue debt to signal their quality. According to the Pecking Order Theory of Capital firms prefer internal capital to external capital because of the amount of information that needs to be disclosed (Esty, 2003i).

Because there are conflicts of interests between managers and investors, debt can be used to align these conflicts. As such project companies provide evidence for the Incomplete Contracting Theory of Capital Structure developed by Jensen and Meckling. Hart and Moore show that there is an optimal debt-equity ratio and an optimal level of senior vs. junior debt (Esty, 2003i).

Research has also been done on the types of debt that are used, namely bank debt or bonds and within bank debt, senior, junior or other types of debt (Gilson, John and Lang, 1990; Sahlman, 1990; Gompers, 1995).

2.3 LITERATURE REVIEW PART 2: PROJECT FINANCE CASE STUDIES

Much of the literature that can be found on Project Finance consists of case studies. This is probably because of the nature of Project Finance in that it is used for very large projects that span years if not decades. Each of these projects has unique properties that distinguish it from others. As such case studies are an ideal way to learn about Project Finance and this is the reason why Professor Esty chose to compile a text book using cases and not simply setting out the theory (2006a).

Over and above the case studies detailed by Esty (2006a), case studies have been done in various countries on different types of projects. These include *Financing the Alaskan Project: The Experience at Sohio*, (Phillips, Goth and Richards, 1979), *A Real Option Analysis of an Oil Refinery Project*, (Imai and Nakajima, 2001), *Project Evaluation in the Presence of Multiple Embedded Real Options: Evidence From the Taiwan High-Speed Rail Project* (Bowe and Lun Lee, 2004), *Cost Benefit Analysis of Private Sector Environmental Investments: A Case Study of the Kunda Cement Factory* (Karmokolias, 1996), *Valuing Flexibility in Private Toll Road Development: Analysis of the Dulles Greenway* (Wooldridge, Garvin, Cheah and Miller, 2002), *Credit Spread Determinants and Interlocking Contracts: A Clinical Study of the Ras Gas Project* (Dailami and Hauswald, 2001) and *Structuring Risk in Project Finance: The Case of the Kutubu Petroleum Development* (Tinsley, 1991).

Case studies have also been published by Euromoney Plc in the two volume series, *Project Finance: Practical Case Studies* (2008). Other smaller, less academic case studies can be found on various websites including those of the World Bank and the IFC.

2.4 Conclusion to the Literature Review

While there is a considerable amount of literature on the various areas of finance, very little of it relates specifically to Project Finance. This, in essence is the motivation for this research. This section has briefly reviewed the existing literature on Project Finance across the five areas identified by Esty (2006a).

Chapter 5 will go on to look at twenty two case studies on Project Finance in order to derive what may be considered a theoretical foundation of Project Finance. This is partially the aim of this research which will be described in full in the next chapter on the methodology of the research.

3. CHAPTER 3: RESEARCH QUESTIONS

3.1 INTRODUCTION TO THE RESEARCH QUESTIONS

Having looked at the research that has been done in the area of Project Finance it is evident, firstly, that there is considerable work still to be done. Secondly, none of this research has been conducted in South Africa.

The objective of this research is to develop a theory base of Project Finance which will be pertinent to South Africa in its infrastructure build programme by looking to case studies of international Project Finance projects. Once this has been done the research will assess the current practise of South African Project Finance against this theory base. In that way the research will act as a catalyst for further research on Project Finance in South Africa which can focus both on Project Finance in general and on specific areas in Project Finance

3.2 THE RESEARCH QUESTIONS

The research therefore intends to address the following questions:

- **Research Question 1:** What theories, principles and lessons can be learnt from the research that has been done on Project Finance and in particular specific projects that are covered in the case studies and that emphasise the different areas of Project Finance?

- **Research Question 2:** What is the current state of Project Finance in South Africa in terms of its focus areas, areas of expertise and potential development needs?

- **Research Question 3:** In what particular areas of Project Finance are further research needed, in particular those that are specific to the South African Infrastructure Build Programme?

4. CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION TO THE RESEARCH METHODOLOGY

This chapter sets out the methodology which has been used to conduct the research. It follows on from the review of the current literature on Project Finance in the Chapter 2 that enabled an understanding of why this research is necessary. It first explores the underlying philosophy of the research and then presents a detailed description of the methodology that was used throughout the research.

The research is qualitative and exploratory in nature as there is very little current research on the topic of Project Finance both globally and locally in South Africa.

4.2 RESEARCH PHILOSOPHY

In undertaking exploratory, qualitative research there is an underlying assumption that the researcher can understand the meaning behind a text or speech of another individual. The approach taken in this research is a Phenomenological Research Method with particular emphasis on Hermeneutics. Phenomenological Research Methods form part of Human Science Research and includes: Ethnography (Participant Observation Research), Grounded Research Theory (unravelling the elements of experience

and then studying these elements and their interrelationships), Hermeneutics (to be discussed below), Empirical Phenomenological Research (returning to the original experience to obtain comprehensive descriptions and using that as the basis for reflective structural analysis that portrays the essence of the experience) and Heuristic Research, “a process of internal search through which one discovers the nature and meaning of experience and develops methods and procedures for further investigation and analysis” (Moustakas, 1994, p. 17).

These and other Human Science Research approaches have the following qualities in common: (Moustakas, 1994)

- They recognise the value of qualitative designs and methodologies which are more appropriate when studying human experiences where quantitative approaches are not applicable
- They focus on the ‘wholeness of experience’
- They focus on the meanings and essences of experience rather than measurements and explanations
- Descriptions of experience are obtained through first person accounts through formal and informal conversations and interviews
- They regard “the data of experience as imperative in understanding human behaviour and as evidence for scientific investigation” (*ibid*, p. 21)
- Questions and problems are formulated in line with the interests and commitment of the researcher and not from a purely abstract scientific point of view

- They view “experience and behaviour as an integrated and inseparable relationship of subject and object and of parts and whole” (*ibid*)

For the purpose of this research a Hermeneutic approach was taken. This is the most appropriate of the Human Science Research approaches because in essence the aim of this research is to understand though texts and conversations the current state of Project Finance research globally and locally in South Africa with the aim of identifying further areas of research to be done. This will become clearer in the balance of this chapter.

The original question of Hermeneutics was: How can one ever understand the meaning of the author’s text? This originated in arguments over how to gain and what constituted a true understanding of the bible. The underlying struggle was with the tension between one’s individuality and the parts of a person that was in common with others (Moustakas, 1994).

According to Schleirmacher, Hermeneutics is “the ability to avoid misunderstanding, because…We can never be sure and we have no proofs, of rightly understanding the individual utterance of another. However…it was never doubted that *behind* a person’s individuality something common and intelligible could be re-enacted” (Moustakas, 1994, p. 9)

This emerged as a question of how can one truly understand the expression of the other? On the one hand, from a relativist’s point of view there is no objective reality and no real true meaning to a text or utterance of another. On the other

hand from the positivist's point of view there is an objective reality. Not only can we understand the original intent of the author but in fact go beyond that understanding (Chipp, 2008).

In the words of Makreel, "Hermeneutics must have more than a negative goal of overcoming obstacles in the way of regaining the original intention of the author. It must also allow for the more productive critique of a work whereby the particular intentions of the author can be refined, either by uncovering what fundamentally underlies them or going beyond them" (Moustakas, 1994, p. 8).

This is not simply a philosophical debate but a critical part of validating scientific, qualitative research. "The Hermeneutic process involves a circle through which scientific understanding occurs, through which we correct our prejudices or set them aside and hear "what the text says to us" (Gademer, 1976, p. xviii)." This research has been based primarily on the researcher's ability to understand and find meaning in the texts on Project Finance and conversations with individuals who are involved in this industry.

But the hermeneutic question that would be asked is: How can the researcher understand the field of Project Finance while not working in Project Finance? If the researcher is working in the field of Project Finance how can he/she look at the field objectively? Michael Walzer, initially in his book *Exodus and Revolution* (1985) and then in *Interpretation and Social Criticism* (Walzer, 1995) introduces the concept of the "connected critic." He says that the only way for true social criticism to come about is of one is on the outskirts of a society, situation or field

of study. This will allow the person to be close enough to understand the issues while being far away enough to remain objective.

The underlying philosophy of this research is that the researcher, having emersed himself in the field of Project Finance for 12 months while not being part of the field of Project Finance is ideally placed to give an accurate account of where the field of study currently sits in terms of academic progress both globally and in South Africa.

4.3 RESEARCH APPROACH

As established in Chapter 3 above, there has been little research conducted in the area of Project Finance in general and specifically within the South African market. Further information is needed before the Project Finance arena can be quantitatively analysed. The design of the proposed research was therefore exploratory in nature using a qualitative design. This helped diagnose the dimensions of the challenges and problems in the South African Project Finance arena and thereby enabled further research to be more specific and on target (Zikmund, 2003).

As such, a large part of the research included interviews with key individuals in the South African Project Finance industry as detailed in section 4.4 and 4.6 below. Interviews, as opposed to questionnaires, allowed for open ended questions and discussion which could facilitate an in-depth and interactive analysis of the issues being explored. In this way the researcher was the

research instrument. The results of the research are therefore more likely to be compelling, as they are not simply facts and figures but lessons learnt from human experience (Gillham, 2005).

Based on the philosophy and approach set out above, a qualitative approach has been adopted in order to allow the research to unfold in an open-ended process. This is because “the open minded researcher cannot always be sure what direction the research will take” (Gillham, 2000, p. 2-3). Preconceived notions can endanger the integrity of the research because elements that are not expected to be seen may be missed (Gillham, 2000).

4.4 RESEARCH DESIGN

The research was conducted in two phases:

Phase 1: Secondary Research was conducted consisting of analysing the general literature on Project Finance and thematic analysis of the case studies contained in *Modern Project Finance* (Esty, 2006a).

Phase 2: Primary Research was conducted consisting of semi-structured interviews, including open and closed questions with key people in the industry to test the relevance of the principles gleaned in Phase 1 (Gillham, 2000).

4.5 METHODOLOGY FOR PHASE 1

4.5.1 RATIONALE FOR THE METHOD OF PHASE 1: SECONDARY RESEARCH

Secondary data analysis can be used for obtaining insights and gaining a clearer idea of problems or challenges in a given area (Zikmund, 2003). Despite the fact that the area of Project Finance is less well developed from a research perspective than other areas of finance, there is some literature available that has been written on it (Esty, 2004). There is now a large enough body of scholarly research on Project Finance, including a number of case studies, to warrant using this as a basis for secondary data analysis before exploring the South African Project Finance landscape (Esty, 2004).

Conducting case studies can also be used to gain insights in exploratory research (Zikmund, 2003). In this instance case studies were chosen as a basis for the analysis as opposed to only general literature because “cases require the reader to integrate knowledge from multiple disciplines when making a single managerial decision. This integration of functional areas such as strategy, operations, ethics, and human resource management encourages the reader to adopt a more integrative perspective and understanding of the interconnectedness of managerial decision-making” (Wiley, 2008).

4.5.2 POPULATION, SAMPLE SIZE AND UNIT OF ANALYSIS FOR PHASE 1

The population of case studies consisted of any case study that has been written on a large infrastructure project, anywhere in the world, that either used Project Finance or demonstrated a principle of Project Finance.

The sample that was chosen consisted of the case studies contained in Esty's book *Modern Project Finance: a Case Book* (2006a). The reasons why only these case studies were used was as follows:

- The case studies written by Esty adequately cover the five areas of Project Finance referred to above in Chapter 3;
- The case studies vary in terms of sector, industry, duration, financial structure, operating structure, level of risk, country and value;
- Access could be gained, not only to the case studies, but also to the teaching notes that accompany them. The pedagogical objectives included in these notes were a key guide to the lessons learnt from each of the case studies. This also lent credibility to the analysis as Professor Esty is recognised as a field expert;
- These case studies are used in various world-class institutions. In addition to both the MBA programme and an executive education programme at Harvard Business School (HBS) these case studies are used in Project Finance courses at New York University (Stern School of Business) and the Kellogg School of Management, amongst others, and

are recommended texts for courses at Johns Hopkins School of Advanced International Studies (SAIS) and the Fuqua School of Business, Duke University (HBS, 2008) ;

- The case studies take an academic approach and are comprehensively written in contrast to many case studies which are simply short descriptions of the project as can be found on the IFC and World Bank websites (IFC and World Bank).

- A number of the case studies cover projects that take place in emerging markets and are therefore more relevant to South Africa and the unique challenges faced in emerging markets. For example, where a project value equals the size of a country's GDP, something that would not happen in a developed country (Esty, 2004).

There are disadvantages to using case studies that have almost solely been written by one author, namely Professor Benjamin Esty. This approach only provides his perspective on Project Finance and could potentially leave out aspects of Project Finance. However the benefits listed above far outweigh and mitigate these disadvantages. This is especially true in an area which is not well developed and where Esty is a world renowned expert on Project Finance, whose textbooks are used in some of the top ranked MBA's in the world.

4.5.3 DATA COLLECTION, DATA ANALYSIS AND DATA MANAGEMENT FOR PHASE 1

Access was gained to the case studies and the teaching notes via the resources of the Gordon Institute of Business Science (GIBS) Information Centre and the researcher's supervisor. Each of these case studies was then analysed by the researcher in order to derive a set of relevant, best practice principles that can be used in the South African Project Finance Industry. This consisted of reading the case study to become familiar with the material and then reading the teaching notes in order to understand the lessons that the teaching notes were trying to get across. Subsequently, using thematic analysis the researcher would construct a mind map of the theory that could be gleaned from the case study. The lessons were drawn mainly from the pedagogical objectives set out by Professor Esty in the Teaching Notes for the case studies as well as from points in the case studies where Professor Esty mentions that a particular concept is important. Furthermore where the researcher determined that a particular point was relevant to South Africa, this was also included. This was carried out on each of the twenty two case studies.

The data was managed by capturing all notes in MindManager Pro 6. Once this had been completed an overall mind-map was printed out containing all the theory that could be extracted form the case studies. The analysis consisted of carrying out a thematic analysis which aimed to identify themes across the case studies. This was then consolidated to create a comprehensive view of the theory that existed in them. The points from the theory were then written up in the form that can be found in Chapter Six below.

4.6 METHODOLOGY FOR PHASE 2

4.6.1 RATIONALE FOR THE PROPOSED METHOD FOR PHASE 2

In order to determine the current state of the Project Finance industry in South Africa as it relates to the theory further research was required. For this, subject matter experts were consulted. These respondents needed to be people who had a good understanding of Project Finance and who understood the unique aspects of the South African Project Finance industry.

4.6.2 POPULATION FOR PHASE 2

The secondary population of relevance from within which the interviews took place was anyone globally that is still or has been involved with Project Finance on a full time basis for two or more years, someone who is in a position of authority as a lead director on a large scale project, the person responsible for the final delivery of the project or the finance of the project. A ‘snowball approach’ was used, where interview respondents were identified and eight interviews were initially set up. At the end of each interview the respondent was asked to recommend other people who it would be valuable to interview.

This was carried out for a period of 3 months, from July until the end of September 2008. In this time sixteen interviews, each ranging from sixty to ninety minutes, were carried out.

As there was no mathematical or statistical analysis, the measurement and theme identification was left up to the judgement of the researcher. This phase was also qualitative in nature. This was a convenience and purposive sample as the interview subjects were only those that the researcher had access to and were handpicked as experts in the field of Project Finance. While not a representative sample of the population, this is appropriate for the exploratory, qualitative research which was conducted here, as the sample was chosen with regard to an appropriate characteristic of the individuals (Zikmund, 2003).

Those interviewed had to be accessible for interviews either in person or by phone within the limits of the time given for the completion of this research paper. The interviews were also dependent on the interviewees granting access to them for the interview. While there are disadvantages to a convenience or judgement sample, the research that was conducted was qualitative and appealed to the expertise of those being interviewed. An assumption was made in conducting the interviews namely that the candidates were telling the truth. There was no reason, however, to assume otherwise.

There were five types of interview respondents:

1. **Funders:** Those that provide the funding for Project Finance, for example: Directors of Project Finance divisions at any of the major banks in South Africa;

2. **Project Executors:** Those that run the projects and require the funds, for example Eskom, Transnet, SANRAL and the management of CIC Energy who are developing the Mmamabula Power station in Botswana;

3. **Facilitators:** Those that facilitate the funding and provide advisory services, such as The Kagiso Group who arranged the financing of the Gautrain Project;

4. **Service Providers:** Other service providers to the industry such as market analysts and construction companies; and

5. **Regulators:** Those involved in the regulation of South African Project Finance such as members of NERSA (the National Energy Regulator of South Africa) and members of the Department of Minerals and Energy (DME).

The number of people interviewed from each of these groups was as follows:

Group	*Number of Interviews Conducted*
1. Funders	**7**
2. Project executors	**3**
3. Facilitators	**2**
4. Service Providers	**3**
5. Regulators	**1**

Table 1: Interview Respondent Breakdown

Further information on the interview respondents can be found in Appendix 1.

4.6.3 UNIT OF ANALYSIS FOR PHASE 2

The primary unit of analysis was the individual expertise that the interviewee possessed and the secondary unit of analysis was the companies' involvement in particular industries where Project Finance is most relevant.

4.6.4 DATA COLLECTION, DATA ANALYSIS AND DATA MANAGEMENT FOR PHASE 2

While it is theoretically possible to separate the data collection and the data analysis in qualitative research, given the complexity and the depth of the issues at hand, the interviews utilised an iterative process in order to gain deeper levels of understanding. In some cases the respondents were asked to comment on responses received from other respondents in previous interviews. In this way the researcher aimed to achieve a greater depth of understanding on the issues at hand and the reasons behind the importance or relevance of the various lessons and principles

The interviews were therefore semi-structured including both open and closed questions. This ensured a level of uniformity to the interviews while still allowing for in depth discussion on certain key points. So while the same instrument, which can be found in Appendix 2, was used across all the interviews in order to ensure consistency, the researcher guided the interview to areas of interest of the respondent as well as to explore issues raised in previous interviews. In a sense, here, the interviewer is the research instrument (Gillham, 2000).

Pre-testing of the interview instrument was conducted as part of the advanced development of the questionnaire in a pilot interview (Gillham, 2000). This was done with an individual working in the Project Finance arena at a more junior level than those identified for the actual interviews. The pilot interview was successful and it was determined at that point that no further pilot interviews were needed. The Feedback from the pilot interview was included in the final analysis.

4.6.5 DEVELOPING THE INSTRUMENT

Initially the intention was to present each interview candidate with a brief set of principles from the case studies and ask him/her the following questions:

1. Please rate the lessons set out in terms of importance to South Africa's success in its Infrastructure Build Programme.
2. In terms of the top three which you rated in terms of importance to South Africa, please explain why you believe this to be so?
3. For each of the lessons, is it relevant to the Infrastructure Build Programme that will take place in South Africa over the next ten to fifteen years and if so or if not, why?
4. What further research needs to be done in the area of Project Finance that will be of benefit to South Africa?

5. Can you recommend any other potential interview candidates who would be able to comment on these issues?

However, once the case study analysis had been completed the results were rich and deep. This presented the researcher with a challenge of retaining the quality of the lessons learned and not making them too generic by trying to condense them too far. (The results of the analysis are discussed at length in Chapter 5.)

Furthermore when the initial interviews were set up the respondents requested that the researcher simply ask questions during the interview as many of the respondents were not willing to spend time reviewing the results of the case study analysis.

For this reason a questionnaire was developed which raised the issues that emerged from the case study analysis and allowed the respondent to arrive for the interview relatively unprepared. The questionnaire was lengthy as it consisted of twenty four questions divided into 5 sections. As such, the respondents could choose which sections to focus on.

Once the interviews had been conducted the data analysis was performed. In the words of Gillham, “Content analysis is about organising the *substantive* content of the interview” (2000, p 59). Although content analysis was not used, following Gillham’s approach, key, substantive points from each question were

identified from each interview and sorted into the necessary categories. This consisted of both constructing frequency tables and conducting a thematic analysis to highlight the most common themes and to identify the most important areas of Project Finance to focus on in South Africa as well as the reasons to justify this.

The process, therefore, proceeded as follows:

1. The first interview was conducted
2. The feedback from the interview was captured in a table in Microsoft Excel 2007
3. The researcher reflected on the emphasis of the responses from the first interview
4. These reflections were captured as notes in the Excel table and themes were identified
5. The second interview was conducted
6. Steps 2 to 4 were repeated and reflections on commonalities and differences between the respondents' feedback were captured in order to start finding meaning in the data.
7. This process was repeated by using the above steps until a point of theoretical saturation where very few insights were emerging from the interviews;
8. Extensive analysis will be performed on the data in its entirety by synthesizing the data into tables or charts where appropriate and developing hypotheses or propositions.

The data analysis combined thematic analysis, constant comparative analysis and narrative analysis (Zikmund, 2003). The table below summarises the data analysis that was used (Clark, 2006):

ANALYSIS METHOD	***RATIONALE***
Thematic Analysis	The data gleaned from the interviews was analysed in detail by capturing the responses in tables in Microsoft Excel 2007 which also acted as a frequency table for the relevant questions
Constant Comparative Analysis	In order to gain a deeper understanding of the issues at hand an iterative process was used whereby constant comparative analysis was performed. In this method the data obtained during an interview was compared to the preceding interviews. This was done during and after each interview.
Narrative Analysis	Where the respondent relates a story in the interview, Narrative Analysis was used to try obtaining a deeper understanding of the meaning behind the story. This was used during and directly after the interview

Table 2: Method of Analysis for Phase 2

Where permitted by the respondent the interviews were recorded. However even where the respondent did allow the interview to be recorded the

researcher still took notes during the interview and used the recording as a back up and to reflect on the interview after it was complete.

"The great virtue of a rigorous content analysis is that it immerses you in the detail of your substantive findings" (Gillham, 2000, p 73). As such the analysis that was carried out and the results of it that are recorded in Chapter 6, while somewhat subjective, could only be carried out by the researcher who in this instance was the "Connected Critic" (Walzer, 1985 and 2004). As discussed in the research philosophy above, it is this relationship to the research, being an outsider while being immersed in it, which enabled the researcher to conduct a thorough and rigorous analysis on the data captured.

4.7 DATA VALIDITY AND RELIABILITY

While quantitative research has to convince the reader that certain procedures have been followed, qualitative research has to convince the reader that it makes sense (Merriam, 1998; Clark, 2006). The analysis was, therefore, done together with the project supervisor to ensure as much objectivity as possible in such a process. Furthermore an expert in qualitative analysis was asked to review the findings. This reduced researcher bias and while subjectivity in qualitative research must be accepted, an expert researcher's additional opinion brings rigour and an element of objectivity to the process (Gillham, 2004; Clark, 2006).

4.8 POTENTIAL RESEARCH LIMITATIONS

The following are limitations of the research study:

- This research will only be applicable to South Africa as that is the focus of the study,
- The research is qualitative in nature and therefore no definitive conclusions will be reached and the findings cannot be extrapolated to other areas of finance, other industries or countries (Zikmund, 2003),
- Only those to whom the researcher has access to, will be interviewed whereas it is possible that valuable input could be gained from project financiers outside of South Africa,
- It would be valuable to also include case studies on South African Project-Financed projects, however no such studies were found. Further research could write up case studies on these projects and then compare them to the findings from this research,
- The interpretations of the findings are judgemental and potentially subjective and the exploratory data here cannot take the place of quantitative research that may follow on as a result of this paper (Zikmund 2003),
- The case studies have a disclaimer that they should not be used as recommendations or endorsements of best practice as is stated in a footnote at the beginning of each case study. However Esty's article: *The Economic Motivations for Using Project Finance* (2003l) echoes many of the lessons learnt from the case studies. Furthermore no other statement

of best practice seems to exist and so the case studies have been used as such.

4.9 CHAPTER SUMMARY

This chapter has motivated the use of a Phenomenological and more specifically the Hermeneutic approach to the research. This followed on to the qualitative design of the methodology both in Phase 1, the Case Study analysis and in Phase 2 in the interview stage.

The previous chapters have built the foundation for the research in terms of the context, background and methodology of the project. The following chapters will outline the actual research that was done starting with the analysis of the international Project Finance case studies.

5. CHAPTER 5: PHASE 1 CASE STUDY ANALYSES

5.1 INTRODUCTION TO CASE STUDY ANALYSIS

The methodology above outlined a two stage analysis for the research. The first consisting of an analysis of the 22 case studies found in Professor Benjamin Esty's book: *Modern Project Finance: A Case Book* (2006a). The second phase consisted of interviews conducted with individuals involved in Project Finance in South Africa.

The following chapter outlines the results of Phase 1. Chapter 6 will outline the results of Phase 2. This consists firstly of a brief summary of the key issues involved in each of the case studies and secondly an analysis of the principles and lessons learnt from the case studies. The summaries have been included so as to provide the reader with context and background for how the principles and lessons were derived. However these are laid out in terms of themes and not corresponding to the case studies from which they emanated, although the original case studies have been referenced for each of the principles and lessons. As such, while the summaries will touch on the lessons learnt from each case the vast majority of the lessons and principles will be explored in the analysis part of the chapter.

5.2 CASE STUDY SUMMARIES

5.2.1 MODULE 1: STRUCTURING PROJECTS

5.2.1.1 THE CHAD-CAMEROON PETROLEUM DEVELOPMENT AND PIPELINE PROJECT (A).

This case study addresses the US$4 billion development of a petroleum pipeline that was to run from the oil fields in Chad, through Cameroon, to be exported from the Kribi Marine Terminal. In 2000 Chad was and now still remains one of the poorest countries on earth, with 80% of the population living on less that US$1 a day This project presented an opportunity to increase general development in Chad and in particular to increase the annual government revenues by more than 50%. The case focuses on the Revenue Development Plan (RDP) of the World Bank that would attempt to ensure that the then leader and ‘warlord’ President Déby, would not misuse these funds (Esty, 2003k).

However once the IFC and World Bank had approved the deal, Déby used part of the signing bonus to buy weapons. The World Bank responded by suspending debt relief and new loan programs. In 2005, Transparency International listed Chad as the world's most corrupt country and in 2006, after the pipeline was completed, Déby reneged on the deal with the World Bank, saying he would spend the oil revenues to finance the military, to buttress his nearly insolvent government, and to shore up his fragile hold on power. In

response, the World Bank suspended its loans and froze Chad's bank accounts. The World Bank and Chad eventually reached a compromise: Chad's government would receive 30% of the oil revenues, instead of the 10% originally agreed to, and the remaining 70% of revenues would be spent exclusively on programs to alleviate the country's poverty (Infoplease, 2008).

The case highlights risk sharing and risk mitigation as motivations for using Project Finance and contrasts the advantages and disadvantages of both Project and Corporate Finance as each of these were used for the two major sections of the project. Furthermore it shows that contractual structure does matter. It also explores the involvement of Multilateral Development Agencies (MDA) as a tool for mitigating sovereign risk and poses the question of how much risk is acceptable in desperate situations such as the economic circumstances of Chad. A further point is the need for sponsors to plan and adopt strategies for dealing with interest groups and social activists as was the need in this case (Esty, 2003k; 2006b).

5.2.1.2 AUSTRALIA-JAPAN CABLE: STRUCTURING THE PROJECT COMPANY.

In 1999 Telstra, Teleglobal and Japan Telecom signed a memorandum of understanding to develop a US$520 million Submarine Telecommunications system linking Australia to Japan. The main challenge was developing the project and selling the capacity before the competitors, who were also building undersea cables. This made creating the project company and raising financing difficult given the time constraints. Typically these types of projects could have

up to 90 sponsors and took five to seven years to complete. Project Finance was used in order to preserve the scarce capital of the sponsors by reducing the equity required from US$200 million to US$30-40 million with a target gearing ratio of 85%.

The main issues dealt with in the case are how to structure project companies to gain the maximum return, the need for a good fit between the sponsors, board composition and the inherent risks involved in high-technology projects. It demonstrates how Project Finance can be used in order to develop an optimal governance system for the project and how it is appropriate for large tangible assets with high free cash flow (Esty and Ferman, 2003a; 2003b).

5.2.1.3 CALPINE CORPORATION: THE EVOLUTION FROM PROJECT TO CORPORATE FINANCE.

Independent Power Plants (IPP) in the United States from the 1980's onwards typically used Project Finance and in particular non-recourse debt. Calpine Corporation had typically used this model as an Independent Power Producer (IPP) but in 1999 the management saw an opportunity to move to the Merchant Power Producer model and to own a vertically integrated part of the power system. This would allow them to grow from 3 000MW to 15 000MW of capacity in 5 years. The challenge they faced was that traditional Project Finance would take too long as Calpine beilieved that the opportunity would only last for a few years. Each power plant would need to be assessed as a separate entity and with US$1.7 billion in assets, a sub-investment grade debt rating and a debt to

capitalisation ratio of 79%, Calpine simply didn't have the balance sheet to use regular on-balance sheet financing

As such they developed a revolving credit facility that consisted of a US$1 billion secured, revolving construction facility that effectively let them have the best of both Project and Corporate Finance. This allowed them to build a power system instead of individual power plants. By 2002 Calpine had moved from the 29th to the 5th largest producer of electricity in the United States of America and had set a target of 70 000 MW of capacity by 2005.

The case study demonstrates how Project Finance can solve the "debt overhang" problem, in that management will not invest in positive net present value projects because of the levels of leverage on an organisation's balance sheet. This is one of the primary reasons why organisations use Project Finance. The case also describes what Project Finance is and how it differs from Corporate Finance as well as exploring a new hybrid structure that combines the advantages of the two.

The USA power industry is also explored by demonstrating the effects of deregulation on electricity markets. Furthermore from a lenders perspective the case shows how a financial institution can lead in a credit market using innovative financial structures (Esty and Kane, 2003d; 2003e).

5.2.1.4 BP AMOCO (A): POLICY STATEMENT ON THE USE OF PROJECT FINANCE.

The BP Amoco (A) case demonstrates the advantages and disadvantages of using Project Finance. When BP and Amoco agreed to a US$48 billion merger in 1998 they had to find a way of unifying each of their different approaches to Project Finance. As such they developed a policy statement regarding when and in what circumstances Project Finance would be used instead of internal funds and/or Corporate Financing.

The policy statement effectively said that Project Finance would only be used in the case of mega projects, projects in politically volatile areas and joint ventures with partners who had weaker credit capabilities. Project Finance would therefore be used as a risk management tool that isolated project risk and could limit the potential damage that a failing project would have on the parent firm.

This case demonstrates how risk mitigation is a motivation for using Project Finance. As a structure, Project Finance reduces the opportunity cost of underinvestment in large risky assets or projects. However there are disadvantages. The two main disadvantages of Project Finance are the increased costs, including direct costs of debt and indirect costs of advisory fees, and the time it takes to arrange a Project Financed deal. It must be said however that the value created by Project Finance comes from lowering the net cost of financing large risky assets or projects.

Project Finance can also be seen as the purchase of a 'walk-away' option on a project because the sponsoring firm is not fully invested in the Project or Asset. The Teaching Note, in particular, presents a theoretical framework for demonstrating why large risky assets that have cash flows that are positively correlated with the sponsoring firm's assets are better candidates for Project Finance (Esty and Kane, 2003b; Esty 2003f).

5.2.1.5 BP AMOCO (B): FINANCING DEVELOPMENT OF THE CASPIAN OIL FIELDS.

Following the merger of BP and Amoco and the development of the Project Finance Policy Statement one of the challenges was the development of the Caspian Oil fields. While BP had used Corporate Finance to fund its involvement in the Early Oil Project, Amoco had used Project Finance. As a unified firm BP Amoco needed to decide on how it would fund the second phase, the US$8 billion Full Field Development Project. This was a large risky project with high political, financial, distribution and industry risks mainly due to the political instability of the region and the volatility in crude oil prices.

The B case exhibits the application of the policy developed in the A case to a specific investment decision. It addresses the question of why a project would be worth more to a sponsoring firm when financed with non-recourse debt as a separate entity than if it were an internal project using Corporate Debt. It also shows the benefits of staged investment when it is possible to do so. Many projects do not have this option or it would not add significant value to do so (Esty and Kane, 2003c; Esty, 2003f).

5.2.2 MODULE 2: VALUING PROJECTS

5.2.2.1 AIRBUS A3XX: DEVELOPING THE WORLD'S LARGEST COMMERCIAL JET (A).

The development and launch of the A3XX, Airbus's super jumbo jet, cost US$13 billion. The decision to go ahead with the project occurred in mid-2000 with delivery scheduled for 2006. According to forecasts, Airbus, believed they could sell over 1500 of these aircraft generating more than US$350 billion in sales over 20 years, allowing them to capture the very large aircraft (VLA) market. This market was dominated by Boeing with its 747 at the time. The greatest challenge for Airbus in this venture was forecasting the extent of the demand and converting those forecasts into pre-orders while also taking into account what Boeing's reaction would be.

The funders of the project included national governments, Risk Sharing Partners (RSP's) who were Airbus's suppliers that would share in the profit of the venture, and Airbus itself. While Airbus did not use Project Finance, the case is still relevant because of the size of the project. It deals with the basic economics of large projects and shows the complexity of forecasting demand twenty years into the future. It also explores the role of governments as sponsors and customers of large projects and the competitive interaction between Boeing, the current monopolist, and Airbus, a potential entrant at the time, in an industry where the costs of entry are enormous. Furthermore the case points to a number of risk mitigation strategies that are often encountered in large projects.

This is a case study of a, so far, successful project. However it does demonstrate the need for Project Finance because by carrying out this project Airbus effectively 'bet the company' which is something that Project Finance ensures that one doesn't have to do (Esty, 2001a; 2001b; 2003a).

5.2.2.2 NGHE AN TATE AND LYLE SUGAR COMPANY (VIETNAM).

In 1996 the Nghe An (pronounced 'Nay On') Tate and Lyle Sugar Company in Vietnam approached the IFC for US$45 million to refinance a US$90 million sugar mill. It had, until that point, been funded by equity from the sponsors, short term loans and a US$40 million bridge loan from the Rabobank. The IFC was motivated by the potential social benefits for the project but was hesitant about certain risks both from the supply and demand side of the project. The IFC did eventually sponsor the Project and there were widespread benefits for the surrounding communities.

There is a distinction between Private Returns measured by a projects Internal (or Financial) Rate of Return (IRR) and Social Returns, measured by the Economic Rate of Return (ERR) which is highlighted in the case. The ERR includes both the financial returns and the social benefits that will be gained by the society in which the project takes place, in order to determine the viability of a project. This is often important in Project Finance where governments and MDA's are involved, who consider more than the financial return of a project. A

framework is presented in the Teaching Note for measuring the ERR (Esty, and Lysy, 2003a; 2003b).

5.2.2.3 AN ECONOMIC FRAMEWORK FOR ASSESSING DEVELOPMENT IMPACT.

Although not a case study as such, this article has been included by Professor Benjamin Esty in his book *Modern Project Finance: A Case Book (2006a)*. It has, therefore, also been included in the analysis here. Furthermore it is especially relevant to South Africa and the rest of Africa because often there are developmental and not purely financial motives for carrying out a project as illustrated by the Chad Cameroon Pipeline (Esty, 2003l) and Mozal (Esty, 2003c) case studies. It follows on from the Nghe An Tate and Lyle Sugar Company case study (Esty, and Lysy, 2003a) and proposes a framework for assessing the Economic Rate of Return (ERR) of a project where the ERR is the overall development impact of the project. This is calculated using the sum of the flows that are used to calculate the Financial Rate of Return (FRR) and the net returns for each of the various project stakeholders. The stakeholders include the project financiers, the employees of the project, the customers, the producers of complimentary products, suppliers, competitors and new entrants, neighbours and the rest of society that could conceptually be affected by the project (Esty, Lysy and Ferman, 2003a).

5.2.2.4 TEXAS HIGH-SPEED RAIL CORPORATION.

The Texas High Speed Rail Corporation was formed to construct a rail network between Dallas, Fort Worth and Houston to service the combined population of ten million. According to the financial plan, which was accepted by the state of Texas, it was estimated that US$6 billion needed to be raised from private investors. The project never materialised mainly because of the time it took to raise the finances and the inability to include public funding in the project.

The case study introduces Equity Cash Flows (ECF) as an alternative valuation methodology to Free Cash Flow (FCF). ECF is commonly used in Project Finance and it highlights some of the short-comings of more traditional valuation methods. The underlying principle is that more complex projects present more complex valuation problems and need more advanced valuation tools to solve them (Luehrman and Regan, 2003, Esty, 2003j).

5.2.2.5 CONTRACTUAL INNOVATION IN THE UK ENERGY MARKETS: ENRON EUROPE, THE EASTERN GROUP, AND THE SUTTON BRIDGE PROJECT

In 1996 senior members of Enron Europe and Eastern Electricity were negotiating an innovative power generation deal. Eastern was one of the largest marketers of natural gas and the fourth largest power generator in the United Kingdom. Enron owned an option to develop a 700MW power plant near Sutton Bridge and the original intention was for the plant to be an independent power producer (IPP) with an off-take agreement that would guarantee a steady

stream of income. However, after negotiating some of the contracts necessary to build an IPP and creating a financial forecast, the return on the project was not exceptional. Furthermore it did not leverage Enron's trading and risk management competencies. The parties therefore looked more toward the Merchant Power Producer (MPP) model that retained gas and/or electric price exposure without an off-take agreement. This would better meet the needs of the sponsors and leverage off their respective strengths.

The deal that was proposed stated that Enron would sell Eastern a long term option to convert natural gas into electricity and allowing it to effectively run a 'virtual power plant.' Eastern would have the right but not the obligation to deliver natural gas and receive cash payments to the equivalent of the market value of the corresponding amount of electricity. Enron in turn would construct an actual combined cycle gas turbine (CCGT) power plant near Sutton Bridge and trade in the gas and electric markets as a hedge. Although there was no legal or physical connections between the actual and the virtual power plants, contracts were put in place to govern this structure called Capacity Tolling Agreements (CTA's). (See Esty and Tufano, 2003, p7-9 and Exhibit 3 for further detail on this structure.)

Until Enron's bankruptcy, the deal was a major success with the plant construction being completed ahead of schedule, the implementation of the CTA and the nomination of this deal as 'Deal of the Year' by Project Finance International. Enron sold the plant to London Electricity for £156 million in cash off an investment of £51 million just over 1 year after the plant started

operations. Following the bankruptcy, London Electricity claimed that Enron owed it over £200 million for failing to provide the gas as agreed in the sale of the plant.

This case study, as well as the following one, is used to illustrate more advanced valuation methods than the previous two case studies focusing mainly on valuing real options. In particular this case illustrates what a spread option is, how it works and how to value it. It further highlights the differences between IPP's and MPP's, shows how physical assets can be used to hedge contractual trading exposures and gives insight into the UK and USA electricity markets (Esty and Tufano, 2003; Esty and Sesia 2003b).

5.2.2.6 BIDDING FOR ANTAMINA

In 1996 the Antamina mine, rich in copper ore as well as other metals, was being auctioned off by Centromin, Peru's largest state-owned mining company. This was being done as part of Peru's Privatisation Programme as a move to stimulate a free-market economy. Some geological studies had been carried out but the deposits on the mining site were not proven and the government was not willing to guarantee the reserves as part of the sale. A US$24 million geological study that would take two years was planned as part of the first phase after the auction, after which it would be known with considerably more certainty the extent of the resources located in the site. It would take between US$581 million and US$622 million to develop the mine depending on the amount of ore found.

Based on these conditions the Peruvian government offered a public, sealed bid auction with a minimum upfront payment of US$17 million and a minimum investment commitment of US$135 million, with an option to return the mine back to Centromin after two years. If the mine was not returned it would have to be developed with a guaranteed investment amount. If these commitments were not adhered to, the developer would need to pay penalties to Centromin. The government used these conditions firstly to raise funds, but also to ensure the development of the mine over the following five years.

The case deals with the decision that the business development team at RTZ-CRA, the world's largest mining group at the time, had to make on how much to bid for the mine. Due to the nature of the bid the valuation and subsequent bidding strategy that had to be developed needed to factor in the option of returning the mine or developing it after two years. Real option valuation and Monte Carlo simulations were introduced as ways of doing this. In the end it was Rio Algom Ltd. who won the bid, with a US$20 million upfront investment and a US$2500 million investment commitment, and not RTZ-CRA who only committed to US$17.5 million up front with a US$900 million investment commitment (Tufano and Moel, 1997; 1998).

5.2.3 MODULE 3: MANAGING RISKY PROJECTS

5.2.3.1 PETROLERA ZUATA, PETROZUATA C.A.

Petrolera Zuata was a proposed crude oil development project in Venezuela that required US$2.4 billion in financing. The project was risky mainly due to the Venezuelan political and economic situation. The Venezuelan economy was heavily dependant on the petroleum industry and as such extremely sensitive to changes in the price of crude oil. Two failed coup attempts, the impeachment of the president and the collapse of the second largest bank are some examples of the political and economic instability of the country.

In 1990 PDVSA, the state owned entity that controlled the petroleum industry decided to allow foreign oil companies to invest in the oil sector through profit sharing. This would require convincing the government that these investments were good for the economy, and the investors that they could safely achieve a good return on their investments. In 1993 the first joint-venture in this sector came about between Maraven, a PDVSA subsidiary and Conoco, a subsidiary of DuPont.

Using comprehensive technical criteria and budgeting, an off take agreement from the government and the use of Project Finance, the project managed to achieve an investment grade rating. This occurred despite the economic and political climate and the fact that both Venezuela and PDVSA’s credit rating was below investment grade. The project was rated as one of the best deals ever

done by a number of analysts and Deal of the Decade by the journal Project Finance

The case illustrates that one of the main motivations for using Project Finance in large scale capital expenditures is to manage and mitigate risk. It also shows how Project Finance allocates risk to the parties best able to manage it and that it minimises capital market imperfections such as transaction costs, taxes and asymmetric information (Esty, 2001c; 2002a).

5.2.3.2 POLAND'S A2 MOTORWAY.

The first private toll road to be built in Poland was the A2 motorway. AWSA, a consortium of eighteen firms, won the contract to build a major part of this road. The project was expected to cost €934 million, €242 million of which would be financed using a project loan from the commercial banks. The balance of funding would be provided using equity from the sponsors, bonds and subordinated debt. To illustrate the size of the project, it tasked the concession with building 254km of road as part of an approved 2600km tolled motorway system. At the time Poland only had 264km of roads, 130km of which were built before World War II.

The major risk with this project, as with all retail projects, was the lack of any type of contract agreement. The forecast revenue of the project, which determined its value, was entirely based on the three traffic forecasts that had been done over the past six years. The government had committed to build

complementary roads and not to build competing roads. Six weeks prior to the expiry of the concession, in June 2000, the commercial banks raised concerns about the accuracy of these forecasts and demanded that an extra €60 million to €90 million be injected into the project as additional equity in case the forecasts were not accurate.

AWSA managed to negotiate a postponement in the deadline. One of the options available to AWSA, which had not been taken, was to approach the European Investment Bank (EIB) for funding. The extra time was used to structure a loan from the EIB which mirrored a zero coupon bond, with all the interest only being paid after seventeen years. The major motivation behind this was that the EIB had an interest in Poland's long-term development. With this loan the financing closed and construction could begin.

The case deals mainly with risk management. In particular it shows how risk management can be viewed in three stages, identification of the risks, assessment of them and then mitigation. It also identifies the role of risk management in Project Finance as carving up risks and returns to achieve higher efficiency and effectiveness of the project. A framework as well as a set of guiding principles is also proposed for managing project risks (Esty, 2003e; 2003i).

5.2.3.3 RESTRUCTURING BULONG'S PROJECT DEBT.

The Bulong Nickel project was developed to extract nickel-ore using a new technology of High Pressure Acid Leeching (PAL) *(sic)*. This technology held high promise for many including Bateman, an international engineering consulting firm. The Bulong mine was sold to Preston Resources in 1998 despite the fact that Preston had recently started a major undertaking in mining nickel and cobalt, called The Marlborough Project. Furthermore Preston had almost no revenue and assets of only A$29 million.

The acquisition was financed with a bridge loan that expired the following year, after which the project would need to be refinanced. This refinancing was done through Barclays using a private placement of US$185 million and was secured by Bulong's assets without any recourse to its owner, Preston Resources. The notes received a sub-investment grade rating for various reasons including the lack of other operations to assist with cash flow during initial operations and weak current and future nickel prices.

The start of operations at Bulong saw the failure of key parts of the technology which caused numerous delays. Processing rates reached design levels only for short periods along with power outages in the region. The technology never worked as expected and by 2001 the project was in default.

Numerous cash injections and concessions by Barclays allowed the project to continue. Two restructuring plans were designed, the second of which was

accepted by Barclays. As a consequence, in 2002, Preston Resources faced the choice of restructuring Bulong Operations Pty. Ltd. or almost certain liquidation. The restructuring consisted of releasing Bulong from its debt of US$185 million and transferring 95% of its equity to the note-holders. This option was put forward to the shareholders who approved the restructuring. However this never solved the inherent problems in the project and in 2003 Bulong went into voluntary administration.

The main objective of this case is to demonstrate the risks of green-field projects, especially those involving new technology, and to illustrate the inherent incompleteness of project contracts despite all the time and effort that goes into them. Furthermore it shows how financial structure can interfere with management's ability to resolve inevitable problems during the start-up phase and what happens when a project needs to be financially restructured (Esty and Kane, 2002; 2003a).

5.2.3.4 MOBILE ENERGY SERVICES COMPANY.

The Scott Paper Company of Mobile, Alabama, owned a large, vertically integrated paper production facility including a cogeneration energy complex. This complex was sold off in 1994 for US$350 million to the Southern Company as part of Scott’s disposal of non-core assets. It was then named the Mobile Energy Services Company (MESC). The original financing was done using a bridge loan and in 1995 this needed to be refinanced. The initial plan was to

raise US$340 million, US$225 million in nonrecourse project bonds and US$85 million in municipal bonds, in order to pay off the bridge loan.

MESC was bound by a 25 year operating contract with Scott as well as eleven other contracts that governed their relationship including all inputs, outputs and maintenance for the energy company. Two months after registration of the bond, it announced that it would merge with Kimberley Clark. Analysts and consultants predicted that this would not have a material effect on MESC and it was decided to continue with the issue of the bond.

Following the merger there was a request to Kimberley Clark to look for lower priced sources of pulp and in 1998 Kimberley Clark announced that it would shut down the Mobile pulp mill, a major source of MESC's revenue. This caused MESC to default and eventually filing for Chapter 11 Bankruptcy followed by a lawsuit against Kimberley Clark, which it won.

The MESC case deals with the issue of operating risk and highlights the classic Project Finance problem: The bargaining situation between bilateral monopolists and the potential for opportunistic behaviour. This is typical of a project where there is Merchant Risk due to the fact that there is only one buyer for the output of a project. Furthermore there is an increase in risk when a company is transformed from a vertically integrated structure to a vertically separate structure with different owners. An additional point, that may seem obvious in theory but in practice does need to be remembered, is that no matter what the financial structure of a project may be, if the deal is uneconomic to

begin with it will not be sustainable over the long term (Esty and Sesia, 2003c; 2003f).

5.2.3.5 FINANCING THE MOZAL PROJECT.

The Mozal Project was a US$1.4 billion aluminum smelter built in Mozambique. It was a significant project in that its value was worth almost what the country's current GDP was and came after almost twenty years of civil war. Furthermore the IFC invested US$120 million in the Project which was its largest investment in any project to date.

The sponsors of the project were Alusaf, the aluminum subsidiary of Gencor, a South African minerals company and the Industrial Development Corporation (IDC) of South Africa. The participation of the IFC allowed the commercial banks to get involved in the deal which they refused to do until that point. The project was a tremendous success, finishing on time and under budget in a country with very little infrastructure. Mozambique itself benefited through job creation and cash from the project as well as the creation of an investment climate in the country.

The case demonstrates how a project can be successfully completed in countries with severe political risk as well as the ways of analysing the environment. While Project Finance initially used higher pricing of debt to manage project risk, this case illustrates the modern form of risk management using project selection, structure, and insurance. This is particularly true of the

involvement of Multilateral Development Agencies such as the IFC who can appraise structure, monitor and finance a deal as well as bring political insurance. Another aspect that is explored is the ethical issue of investing in emerging markets where the sponsors can often be seen to be profiting off the poor (Esty, 2003c; 2003h).

5.2.4 MODULE 4 FINANCING PROJECTS

5.2.4.1 CHASE'S STRATEGY FOR SYNDICATING THE HONG KONG DISNEYLAND LOAN (A).

Due to the sheer size of Project Finance deals, commercial banks will often syndicate the loans with one of the banks taking a lead role as the arranger of the loan. Chase Manhattan Bank was appointed the lead arranger for HK$3.3 billion of bank financing for the Hong Kong Disneyland project. The total value of the project was HK$14 billion (US$1.8 billion).

Disney chose Chase as the lead arranger because of its recognised leadership in syndicated finance and its commitment to underwrite the entire loan. The case deals with Chase’s strategy for syndicating the loan including how to decide which banks to invite, how to allocate fees and titles and how much of the loan to keep on the balance sheet. The strategy was successfully executed and following the syndication offering, the deal was almost 300% oversubscribed by the total bank commitments.

The main objective of the case is to illustrate the practice of bank syndication, which is the main fundraising tool used in Project Finance. This includes the process of syndication, the participants, the economics of the lending and the design of the strategy. A key point which is highlighted is the importance of relationships in syndicated lending (Esty, 2003b; 2003g).

5.2.4.2 THE INTERNATIONAL INVESTOR: ISLAMIC FINANCE AND THE EQUATE PROJECT.

The Equate Project was a US$2 billion petrochemical plant in Kuwait. The two main sponsors were Union Carbide Corporation (UCC) and Petrochemical Industries Company (PIC). The sponsors explored various financing methods but each of them included a tranche of Islamic Finance, meaning that the funding would adhere to *Sharia* principles under Islamic law. The mandate for raising this had been awarded to Kuwait Finance House (KFH) who had approached an Islamic investment bank, The International Investor (TII), to place this tranche.

Although PIC could have financed the project on its balance sheet, it chose to use Project Finance in order to bring in a foreign partner, namely UCC. UCC also wanted to use Project Finance in order to limit its exposure in Kuwait. Islamic funds were chosen alongside the bank debt because it added another avenue of accessing finance and in order to improve the appearance of the project which was taking place in an Islamic country and where a government owned entity held a large part of the project.

The project faced several challenges in raising the Islamic Finance as it was in short supply and integrating Islamic Finance with conventional funds was a complicated task. Nevertheless Islamic Finance was simply seen as another type of Structured Finance with some specific principles. In the final structuring of the deal two tranches of US$100 million of Islamic Finance were issued

The case highlights the growing need to understand Islamic Finance as a structure that is slowly gaining momentum in global capital markets as well as the primary financing structures used in Islamic Finance. From a Project Finance perspective the case demonstrates how Project Finance is a form of Structured Finance. As a number of the previous case studies show, high leverage can be used as a form of managerial discipline (Esty and Millet, 2002; Esty, 2003m)

5.2.4.3 INTRODUCTION TO ISLAMIC FINANCE (NOTE).

Following the previous case study, in 5.2.4.2, and given the slow but steady rise in the need for Islamic Finance as well as its complexity, Professor Benjamin Esty provides a note explaining how Islamic Finance Works. The note includes the background to Islamic Finance, an explanation of all the relevant Arabic terms, a brief overview of the international institutions currently providing Islamic Finance and the various instruments that are currently used. Esty also goes on to identify the current challenges in this area and expected future developments

(Esty, Qureshi and Millet, 2000). A brief description of the principles of *Shaariah* law can be found below in 6.6.4.

5.2.4.4 FINANCING PPL CORPORATION'S GROWTH STRATEGY.

In 2001 PPL corporation, a Fortune 500 company with US$5.7 billion in revenues, had approved a US$1 billion investment in peaking power plants as part of its growth strategy. A number of financing options had been looked at for the peaking plants including Project Finance, Corporate Finance and various leasing structures. The Financing had to be finalised quickly before the option to buy the turbines expired.

PPL did not have the balance sheet to fund its growth ambitions and so the projects needed to be funded off their own cash flow. Furthermore, if the projects were financed on-balance sheet, then once the projects were complete they would immediately start depreciating and having a significant effect on PPL's bottom line. As such, Project Finance was seen as less favourable because even though the debt would be non-recourse the assets would sit on the balance sheet as PPL would own 100% of the project. For this reason leasing structures, which would allow off-balance sheet treatment, were more attractive.

A 'limited recourse, synthetic, leveraged lease' was used which allowed PPL to get significant project leverage without increasing the leverage on its balance sheet or affecting its credit rating. The lease was structured by creating a

Special Purpose Vehicle (SPV) that would arrange financing and acquire the turbines. At the same time it would enter into a seven-year lease with a newly formed division of PPL.

The objectives of this case are to contrast leasing as an alternative to Project Finance and to show the financial, tax and accounting implications of using such leases. As such, it explores the motivations for leasing especially those that challenge efficient markets theory (Esty and Ferman, 2003c; Esty and Sesia, 2003e).

5.2.4.5 BASEL II: ASSESSING THE DEFAULT AND LOSS CHARACTERISTICS OF PROJECT FINANCE LOANS.

In 2002 the Basel II committee released the initial proposal for changes to the Basel I Accords. The new requirements reflected the committee's belief that Project Finance loans were considerably more risky than other loans resulting in higher capital weighting requirements for Project Finance of up to three or four times the current amounts.

A consortium of international banks, worried that the new requirements would make many projects uneconomic, especially for smaller banks, decided to challenge the proposal. They did this by analysing the default and loss characteristics of their Project Finance loans and comparing that to their Corporate Finance loans. The first phase of this study consisted of looking at the loss given default (LGD) and the probability of loan default (PD).

The results demonstrated that Project Finance was, in fact, less risky than Corporate Finance. The ten year cumulative PD of Project Finance loans, using a broad definition of Project Finance, were 7.63% and 3.68% using a narrow definition, while Corporate Finance loans had a PD of 9.38%. The LGD of the Project Finance loans was 56%, similar to that of BBB+/BBB corporate loans.

Following the release of these results the Basel committee revised its proposal and set new criteria for Project Finance loans. However the proposal included three approaches for assessing the risk weighting depending on the type of institution and, as such, many banks would still have to use somewhat higher capital risk weightings.

The perception that project lending is highly risky is dealt with in this case and it provides one of the only documentations of studies done on the default and loss characteristics of Project Finance loans. It explores the reasons for the differences in risk profiles of Project and Corporate Finance and thereby contrasts, and shows the differences between them (Esty and Sesia, 2003a; 2003d).

5.2.4.6 IRIDIUM LLC.

Iridium LLC was one of the largest private sector projects in corporate history worth almost US$6 billion. It proposed to offer global phone, fax and paging services via seventy seven satellites orbiting the Earth. However, three months

after commencing services, it was forced to file for bankruptcy. The assets were eventually sold for less than US$50 million.

The problems that the project faced were numerous including getting capital and accessing the same frequency in every country of operations. One of the main failures was in the sales and marketing with prices per call that were completely unfeasible and the fact that when the advertising campaign was launched, worth US$180 million, the products weren't available. Furthermore the product was 'the size of a brick' and didn't work as promised.

Motorola was the initial sponsor and invested US$100 million in research in the first phase of the project. The initial capital for the launch was raised from twenty one strategic partners, mostly international telecommunications players. Following this Iridium also raised equity through an Initial Public Offering (IPO), worth US$240 million, three tranches of high yield debt totalling US$1.1 billion and a US$1 billion secured bank facility.

Bankruptcy is a financial problem and as such the case analyses Iridium's failure from a financial standpoint. In particular it looks at the reasons that such projects use highly leverage capital structures, why specific types of capital are used and in what order they should be raised. These points are used to support various theories of capital structure such as Agency Based and Incomplete Contracting theories.

From a Project Finance point of view, the case illustrates, on the one hand, the benefits of using Project Finance for high risk projects and on the other hand the dangers of using Project Finance for retail or high technology projects. One of the main reasons identified in this is the difficulty in valuing large projects with unproven technology. As a last point the case also highlights issues of project governance with specific focus on board size and composition (Esty, 2002b; 2003d).

5.3 CHAPTER SUMMARY

This chapter has summarised each of the twenty two case studies in Professor Benjamin Esty's book, *Modern Project Finance, A Case Book (2006a)*. This was done with the aim of providing the reader with a cursory overview of the case studies before presenting the analysis of the principles and lessons that emerged from them, in the following chapter. Furthermore these summaries can provide a reader with direction as to which case studies cover which topics and what issues of Project Finance are dealt with in each one. Chapter Six, which follows, presents a high level analysis of the lessons, principles and theories that are contained in these case studies.

6. CHAPTER 6: ANALYSIS OF CASE STUDIES

6.1 CHAPTER INTRODUCTION

Having summarised the relevant case studies in the previous chapter the reader should have a good understanding of the types of issues dealt with in each of the cases. This chapter outlines the lessons and principles that emerge from the case studies. The structure follows the broad headings used in the previous chapter and in the literature review in Chapter Two. However the detailed structure follows the themes that have surfaced through analysis of the case studies, namely:

- Defining Project Finance
- Structuring Projects
- Valuing Projects
- Managing Project Risk and
- Financing Projects

The particular case studies that the concept pertains to are cited, where appropriate.

The following analysis does not attempt to give a comprehensive analysis of all areas of Project Finance. Rather the purpose of this chapter is to explore the various areas within Project Finance so that the reader or researcher may,

firstly, gain a good understanding of the theory of Project Finance and, secondly, enable further research in particular areas.

6.2 SECTION 1: DEFINING PROJECT FINANCE

Section 1.7 above deals with the definition of Project Finance. However it is a strong theme in a number of the case studies especially the BP Amoco development of a policy statement on Project Finance (Esty, 2003f) and the Basel II study (Esty and Sesia, 2003a; 2003d). There are three main points that arise with regard to the definition of Project Finance. Firstly, that non-recourse debt is a defining characteristic of Project Finance and is described as the "*Sine Qua Non* of Project Finance" (Esty, 2003f, p.3). The point of Project Finance as opposed to corporate financing is that the project is financed against the strength of the future cash flows of the project. As such, "the critical feature of non-recourse debt is that it traps liability at the project level" (i*bid*).

Another defining feature which facilitates the placement of limited or non-recourse debt is that Project Finance almost always involves a stand alone entity with separate legal incorporation. This structure then enables the project itself to take on debt, with limited or no recourse to any of the sponsors' or various other stakeholders' balance sheets (Esty, 2003f).

The importance of having a definition of Project Finance is illustrated in the Basel II case study. What emerges is that while the concept of Project Finance is easy to articulate, especially when identifying defining characteristics, when it

comes to actually deciding whether a particular project was Project Financed or not, it can be considerably more difficult. In fact depending on the definition used in the Basel II case the probability of default (PD) was either 7.63% or 3.68% depending on how broad the definition was (Esty and Sesia, 2003a; 2003d).

Many of the cases also deal with hybrid Project-Corporate Financing, such as PPL, which used synthetic leases (Esty and Ferman, 2003c; Esty and Sesia, 2003e), The Calpine Corporation that 'evolved' from Project to Corporate Finance (Esty and Kane, 2003d; 2003e) and even the Airbus A3XX which didn't use Project Finance as such, but used many of the tools of Project Finance (Esty, 2001a; 2001b, 2003a).

The definition of Project Finance is therefore of critical importance when researching Project Finance because, depending on the definition chosen, the results can be dramatically different. In practice this issue may emerge as a debate between the Project and corporate financing divisions of a bank regarding to which division a project belongs, but in researching Project Finance it needs to be distinguished from corporate lending which is a more extensively researched area of finance (Esty, 2004).

6.3 SECTION 2: STRUCTURING PROJECTS

6.3.1 WHY USE PROJECT FINANCE AS A FINANCING STRUCTURE?

In defining Project Finance it was noted that its defining characteristic is non-recourse debt. However there are many motivations for using Project Finance as a financing structure and many benefits that it brings to a project as opposed to Corporate Financing. Many of the case studies identify these benefits and point out the motivations of the sponsors in choosing to use Project Finance in each case.

There are three broad benefits of Project Finance which can be categorised as follows:

- Risk Management,
- Lowering net costs of large risky projects and
- Facilitating investment in large projects that have a positive NPV.

The following sections enumerate the motivations for and benefits of using Project Finance. It should be noted that certain aspects of these motivations may overlap with each other and that these elements are not mutually exclusive.

6.3.1.1 LOWERING NET COSTS

The main benefit of Project Finance is that it “creates value by lowering the net cost of financing large risky projects” (Esty, 2003f, p 2). While Project Finance may appear to be more expensive, this is only the case when comparing Project Finance deals to Corporate Finance deals. However within large risky projects, Project Finance actually lowers the net costs of the project. Furthermore Project Finance is relatively more attractive than Corporate Finance whenever a Corporate Finance investment increases the total combined risk of the project and sponsor (Esty and Sesia, 2003c).

6.3.1.2 LIMITING DOWNSIDE RISK

Project Finance limits downside risk by ensuring that a project that fails does not contaminate the project sponsors (Esty, 2003k; 2003c). For example, from a Project Finance perspective, the Iridium project which lost over US$5.5 billion was a partial success because while it didn't succeed in becoming profitable it was a risk worth taking and didn't destroy Motorola with it (Esty, 2002b).

6.3.1.3 INVOLVING MULTILATERAL DEVELOPMENT AGENICES

Project Finance also facilitates participation by multilateral development agencies (MDA) such as The World Bank and its subsidiary, the IFC. These agencies bring funding which can be cheaper and, in addition, bring implied political risk insurance (Esty, 2003k). This is dealt with below.

6.3.1.4 REDUCING EXPECTED DISTRESS COSTS

Project Finance reduces expected distress costs, which Esty defines as the "cost of default multiplied by the probability of default" where the cost of default includes the expected expenses that would occur in the case of default, such as lawyers and bankers fees. These costs can range as high as 10% of firm value. An appropriate risk management program should be able to eliminate these costly "lower tail outcomes" (Esty, 2003k, p. 6-7).

6.3.1.5 PREVENTING UNDERINVESTMENT

The structure of a Project Finance project can prevent under-investment due to 'managerial risk aversion.' Managers may not accept positive NPV projects because of the size of a project and the effect that such a large project could have on the parent organisation. Project Finance can allow a firm to carry out a project that is much larger than its balance sheet would be able to support. In this way Project Finance allows managers to decide on projects based on their NPV and not on their size.

Another reason why an organisation would choose not to invest in a positive NPV project, even though it is not too big for its balance sheet, is that the project would increase the firm's leverage. This is referred to as the 'debt overhang problem.' Embarking on a project has an opportunity cost where the extra leverage needed can induce under-investment in positive NPV projects. In

other words managers will reject even positive NPV projects because of the leverage needed (Esty, 2003k; 2003b; Esty and Kane, 2003e).

Once one project owned by the firm has considerable debt financing against its assets, it would be very difficult to sponsor further projects because the assets are already bonded (Esty and Kane, 2003e). The high leverage used in Project Finance preserves scarce capital, as the firm only needs to put in a certain amount of equity into the project after which up to 90% of the funds can be raised through various types of debt. There are even cases where a project can be funded from 100% debt such as the Australia-Japan undersea cable (Esty and Ferman, 2003a). Project Finance allocates the capital returns of new projects to new capital providers rather than creating more senior claimants (Esty and Kane, 2003e). In other words, a firm can carry out projects using high levels of debt rather than bringing in other equity partners that will have an equal claim on the returns of the project.

6.3.1.6 INCLUDING HOST GOVERNMENTS

The Project structure facilitates the inclusion of host governments who can often play a pivotal role in a project. Due to the size and nature of the projects, even outside of infrastructure, governments have a vested interest in some large projects. This can be because of regulatory reasons or because of expected income for the government from the project (Esty and Ferman, 2003b).

6.3.1.7 DESIGNING UNIQUE GOVERNANCE SYSTEMS

Governance systems of firms are designed to manage portfolios of assets. As such this governance system may not be ideal for large assets that the firm wants to invest in. By using Project Finance and creating a separate company the sponsors can create an optimal governance system for the project assets (Esty and Ferman, 2003b).

Project Finance is particularly appropriate for large tangible assets with high free cash-flow or with assets which are susceptible to opportunistic behaviour. As discussed in the points above, Project Finance helps disgorge free cash flow using high leverage where this limits the number of necessary sponsors and the remaining free cash flow can be distributed to the shareholders. The high leverage guards against opportunistic behaviour by raising the necessary debt repayments. This means that the banks keep a closer watch on the project and that there is less cash in the project that could be misused (Esty and Kane, 2003e). "Debt based governance systems are particularly appropriate...as a way of forcing managers to disgorge free cash flow" (Esty and Ferman, 2003b, p. 2).

6.3.1.8 THE USE OF HIGH LEVERAGE

In terms of why high leverage is used, there are two main reasons. Firstly, high leverage is an interest tax shield. As interest is paid before tax, higher leverage will increase the project's value by increasing its Return on Equity (ROE).

Secondly, Agency Theory explains that structure is determined by a trade off between agency cost of equity (Ke) and the agency cost of debt (Kd) (Esty and Kane, 2003e). If a project doesn't have many positive NPV opportunities for investment, such as a power plant or toll road which really only has one use, then more debt is appropriate because the equity on the 'agency,' being the sponsor, can be put to better use elsewhere. However in the case of a piece of land with mineral rights where there is an option to mine or sell the land the leverage would be lower because the project has other positive NPV options which attracts the equity and the debt can be lowered appropriately. Agency theory is dealt with in further detail below (Esty and Ferman, 2003b; Esty, 2001c).

In certain circumstances Project Finance can be seen as tantamount to buying a put option on a project so that a firm can walk away from it. This is due to the high leverage used in Project Finance which means that only a small amount of equity relative to the entire project has to be put down in order to carry out the project (Esty, 2003f).

Project Finance is an attractive alternative if a firm has a sub-investment grade rating. A firm with such a rating may not be able to carry out a project on its own, however it can still be part of a well structured project that due to its inherent nature of the project structure can break through the credit rating ceiling of the sponsoring firm. Furthermore if a firm has a low investment grade rating but wishes to preserve those ratings by not altering its capital structure,

Project Finance can be used to still carry out the project without changing the sponsoring firm's balance sheet (Esty, 2001c).

As noted above, Project Finance generates additional interest tax shields through high leverage. Additionally, it can often lead to reduced taxes by host governments if they see a benefit from the project to the country (Esty, 2002b). There could be other tax benefits as a result of where the project is situated or how it is structured which a parent firm would not have access to.

6.3.1.9 MINIMISING MARKET IMPERFECTIONS

Project Finance creates value by minimising capital market imperfections and efficiently allocating risk to those parties best able to deal with them (Esty, 2001c). There are 5 major market imperfections (Esty, 2003f):

- Taxes,
- Distress costs,
- Transaction costs,
- Agency costs and
- Information costs

For example, as a result of the extensive analysis which is conducted, it can add value by reducing the asymmetric information between insiders and outsiders. Furthermore there is enhanced transparency because the project is isolated. This means that cash flows and assets can be analysed by themselves without the influence of other firm assets or cash flows (Esty, 2003f).

In a Project Finance deal structures can be re-arranged more easily if default does occur because they are not part of a larger organisation. Restructuring won't have a knock-on effect on other divisions.

As can be seen there is a wide array of benefits that Project Finance provides to all the stakeholders in a large project. There are however some disadvantages to the Project Finance structure.

6.3.2 THE DISADVANTAGES OF PROJECT FINANCE

Project Finance has certain disadvantages when compared with other financing mechanisms. In certain circumstances this means that it is not appropriate even for a large project. So, while certain aspects of the structure may be advantageous in one circumstance, it may be to the project's disadvantage in another (Esty, 2003f). The following sections detail the shortcomings of Project Finance and illustrate in what circumstances it should not be used. It should be noted that the items in this list are not mutually exclusive.

The main disadvantages of using Project Finance is that it is time consuming to arrange, costly to set up and very rigid once in place (Esty and Kane, 2003e).

6.3.2.1 COSTS

In general Project Finance is more costly than Corporate Finance. However as noted above, this is only true when comparing between the metrics of the financing mechanisms such as the interest rates on the debt. Within the same project, Project Finance would be cheaper. According to Esty (2003f) the increase in the costs is due to:

- Additional Financing costs such as up-front costs. Project debt is sometimes more expensive than corporate debt for high rated sponsors who have lower leverage than the typical project company.
- Large corporations can use cross-collateralisation of asset cash flows and isolating one project may be more expensive than using the existing projects to support a new one.
- If there is little chance of default or significant distress costs in relation to the corporation's current balance sheet and cash flow situation then it may be more expensive to isolate a project and structure it using Project Finance.
- Third party costs. These include financial structuring, legal and advisory fees, engineering consultants that need to be independent and market reports. The cost can range from fifty to over two hundred basis points over and above a regular corporate finance deal. However it must be said that although the transaction costs are high, they are a once off fee and the sponsors bear the residual risk.
- Indirect costs that include the managerial time associated with negotiating and structuring deals.

- Esty (2003f) reports that Klein, So, and Shin demonstrate that total transaction costs for infrastructure average 3-5% of the total amount but can go as high as 10% in unique, smaller, first-of-a-kind projects. However it should be noted that fees do not increase proportionately with project size. This means that larger projects have a cost advantage over smaller comparable ones.
- Project Finance typically takes longer to arrange because it involves more independent parties. Delays can incur additional costs and a carefully crafted deal could fall through if left for too long.
- The extent of the fees and the size of the deals usually mean that the market can only absorb a few deals at a time. This means that there are a limited number of Project Finance deals that can be done in the market at any one time (Esty and Kane, 2003e).

6.3.2.2 RESTRICTING MANAGERIAL FLEXIBILITY

Although it may be intentional and can work to the advantage of investors, Project Finance restricts managerial flexibility. This would be considered a hindrance in a corporate environment run by management. There is an underlying assumption here that discretion is valuable because managers respond to changing conditions with improved strategies but this isn't always the case. If assets have few growth options and a large amount of free cash flow, which is where Project Finance is most appropriate, then this assumption doesn’t hold true. In these cases Managers need to run the operation as effectively as possible and not look at other opportunities (Esty, 2003f).

6.3.2.3 GREATER DISCLOSURE

Project Finance requires greater disclosure due to the extensive analysis that needs to be done in estimating and validating the future cash flows of the projects. There is therefore the potential for leakage of sensitive information, even though a non-disclosure agreement may have been signed (Esty, 2003f).

6.3.2.4 HIGH TECHNOLOGY PROJECTS

High technology and retail projects often need a high degree of flexibility to adapt to market changes. In a Project Finance structure it is very difficult to change direction once the project is underway. In fact, most of the time, the only aspect of the project that can change is the execution of it (Esty, 2002b). Project Finance should also not be used for high technology projects as the future is less certain than other large projects. This uncertainty makes it extremely difficult to write comprehensive contracts that govern the project (Esty and Ferman, 2003b). Furthermore, high technology industries can change much faster than infrastructure. For example, a project may take five years to implement and within that time high technology industries may have radically changed.. An example is the Iridium project where one of the problems was that after spending US$6 billion, the technology was no longer relevant and the mobile phone industry had moved considerably ahead of where the project's proposed value lay (Esty, 2002b).

While there are disadvantages to Project Finance, most of them are the counterpoints to the benefits. In other words, Project Finance structures are designed for very specific types of projects and the disadvantages emerge when the structure is applied to a project which is not necessarily appropriate. In those instances a Corporate Finance approach may be more suitable. Any party involved in a large infrastructure deal needs to weigh up these disadvantages because Project Finance is not always appropriate. In recognition of this many Projects have attempted to use hybrid Corporate-Project Finance structures.

6.3.3 COMBINING PROJECT AND CORPORATE FINANCE

A number of the case studies, referred to in Chapter 5, deal with hybrid Project-Corporate Finance structures. They demonstrate that elements of Project and Corporate Finance can be used in new financial structures that utilise the advantages of both (Esty 2001; 2001b; Esty and Kane, 2003d; 2003e; Esty and Sesia 2003a). Financial institutions can lead credit markets by developing innovative financial structures to support a client's changing financial needs. This financial innovation can involve unique risks but there are also rewards for those that do (Esty and Kane, 2003d; 2003e). The main motivation for including an element of Corporate Finance is due to the costly structuring and funding that Project Finance requires. This is especially true if the company does have the option of using Corporate Finance, for example, if it has a high credit rating and large balance sheet (Esty, 2003k).

The Project Finance structure offers advantages and disadvantages as well as the opportunity to incorporate certain aspects of corporate finance when appropriate. This covers the overall structure of the project. Many of the cases however focus specifically on the capital structure of the projects which is a key element in the Project Finance structure, as will be described below.

6.3.4 PROJECT FINANCE CAPITAL STRUCTURES

The main question regarding capital structure is: what determines capital structure? In other words, what factors influence the levels of debt that a project can withstand? According to Esty (2002b) this forms the question of Myers' Capital Structure Puzzle (1984) and is addressed by referring to a number of theories regarding capital structure.

There are a number of theories that explain capital structure, or at least elements of it. What follows is a description of some of the major theoretical areas that explain capital structure. Many of the theories refer to some element of market imperfection to explain why a certain capital structure was chosen. It should be noted that the theories are not mutually exclusive. In reality all of the imperfections are combined in differing amounts, times and settings.

According to Esty (2001c) Project Finance capital structures stand in direct opposition to Modigliani and Miller's (1958) proposition that capital structure is irrelevant because a firm cannot have a 'wrong' amount of debt. In Project

Finance, as detailed in the advantages of Project Finance above, the structure adds immense value.

6.3.4.1 STATIC TRADE-OFF THEORY

Static Trade-off Theory deals with the effects of taxes and financial distress costs, which are the probability and cost of distress. In this theory the “manager’s job is to maximise firm value by increasing leverage to the point where the marginal gain from additional tax shields equals the marginal loss from additional distress costs" (Esty, 2002b, p. 10-11). This means that debt will be taken on to a point where the trade off between the gain from tax shields and the increased probability of distress reach a static point where it is no longer feasible to take on more debt.

6.3.4.2 ASYMMETRIC INFORMATION THEORIES

There are a number of Asymmetric Information theories, cited by Esty (2002b), including Myer’s Pecking Order Theory, Ross’s Signalling theory and Agency Theory. According to the Pecking Order Theory firms prefer the least information-intensive form of capital available. Therefore private debt, such as bank debt where the sponsors only have to reveal information to the banks and the other sponsors, precedes public debt, such as bonds where a project may be in the public eye and problems within the project may be taken out of context and blown out of proportion in the media.

This theory however can't explain why most high growth start-up firms have very low, if any, leverage. If it was simply a matter of revealing information then small firms would not mind taking on debt as long as it was private. It does explain however to what extent and in what order mature firms will take on debt. Concerning large projects it is quite relevant in explaining why sponsors would prefer bank debt over bonds, especially in high profile projects.

According to Signalling Theory firms issue debt to signal their quality. This explains changes in leverage but not the amount of leverage that a firm will take on. Similarly in a project environment it explains that a project will take on debt in order to demonstrate the quality of the project but it doesn't explain why certain types of projects or projects in certain sectors would have higher leverage than others.

Agency Theory deals with minimising agency costs. There are two types of agency costs, the Agency Cost of Equity (ACE) and the Agency Cost of Debt (ACD). If there is too little leverage then the project will be subject to ACE as managers will waste free cash flow and have little incentive to work hard. If there is too much leverage then the project will be subject to ACD. Here managers will under-invest in risky, positive NPV projects and over-invest in risky negative NPV projects. This is known as the Risk Shifting Phenomenon where there is a focus on cost minimisation rather than value maximisation. The effect of leverage on the Agency costs of equity and debt are illustrated in Figure 1 below, which has been reconstructed from the Iridium case study Exhibit TN-5 (Esty, 2002b, p. 30).

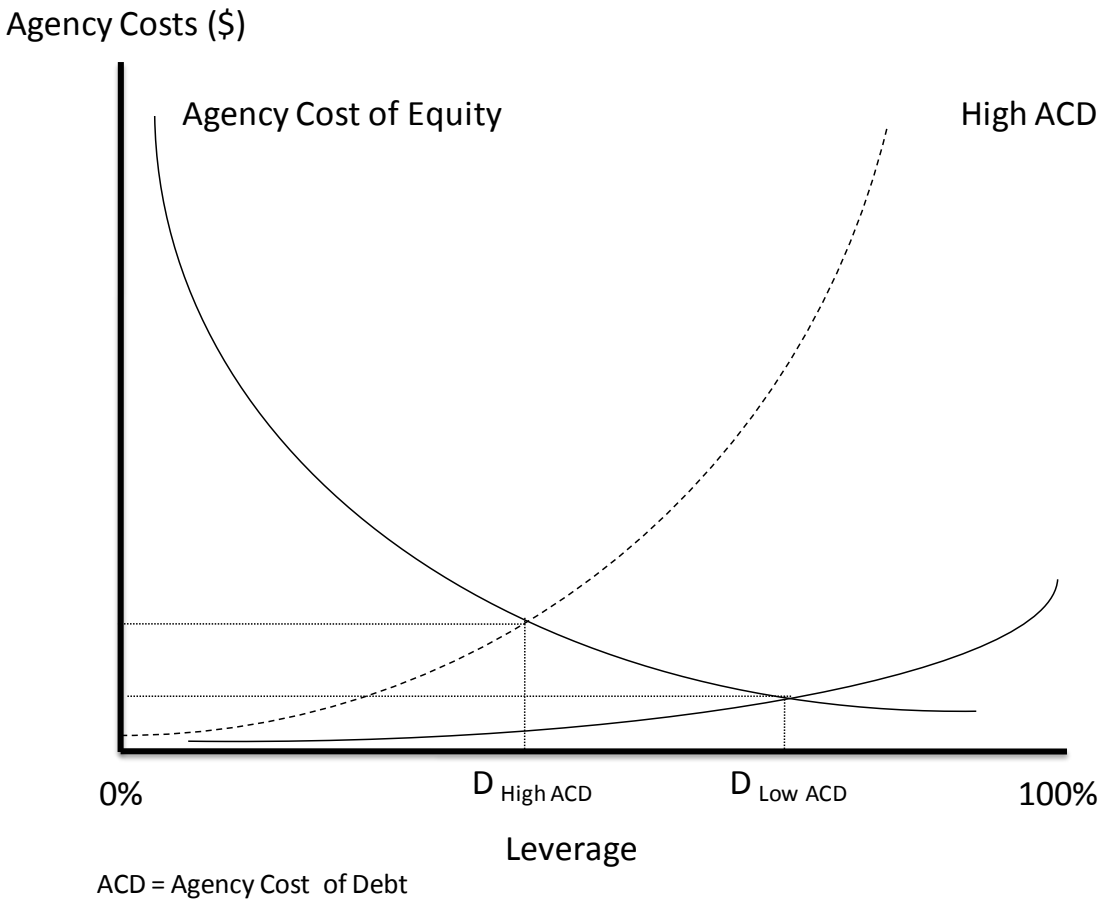

Figure 1: The Agency Cost of Debt and Equity

Conversely, high leverage can increase value, being Return on Equity (ROE), as long as it does not have very high offsetting costs namely ACD. Furthermore high levels of debt can be used as a solution to the incomplete contracting problem. This says that despite the extensive contracting that takes place in Project Finance, the projects nevertheless remain incomplete. High levels of debt can be used to align the objectives of sponsors and management to the success of the project even though there are natural conflicts of interests between managers and investors. This relates to Jensen and Meckling's Incomplete Contracting Theory of Capital Structure which project companies

provide evidence for. Taking this one step further Hart and Moore show that there is an optimal debt to equity ratio and an optimal level of senior vs. junior debt (Esty 2003i).

Other theories have looked at the effects of transaction costs and competitive positioning but these relate more to changes in leverage rather than the total amount of leverage. In terms of the relationship between the size of the project and the levels of debt there are mixed results from empirical research about this relationship.

As can be seen these theories shed some light on why projects have certain capital structures but due to the size and nature of Project Finance there are often unique elements to each project which means that no theory can explain a broad range of projects (Esty, 2002b).

Having looked at the financial structure of the projects it is also important to look at the structure of the parties involved in a project. Every project has certain parties that need to take part such as those providing the funding, those sponsoring the project, the advisors to the project and the developers of the project. Projects in developing or emerging markets often involve Multilateral Development Agencies (MDA's) which also play an important role in a project.

6.3.5 INVOLVING MULTILATERAL DEVELOPMENT AGENCIES

One of the central aspects of the Project Finance structure in developing and emerging markets is its ability to involve Multilateral Development Agencies (MDA's). The case studies often mention the involvement of the World Bank and its subsidiary the International Finance Corporation (IFC). The World Bank and other MDA's aims are to alleviate poverty and stimulate economic growth. As such, while the money they lend needs to be at economically viable rates they don't have a pure profit motive, as with private corporations. This can result in longer tenures in lending terms and generally looking for an economic rate of return and not just a financial rate of return (Esty, 2003k; 2006b).

An MDA can play four types of roles in a project (Esty, 2003k):

1. Project appraisal including environmental assessments
2. Structuring the project to ensure fairness, minimise social and environmental impact and looking at the long term sustainability of the project
3. Direct investments into the project and
4. Deterring sovereign interference by using its power as a lender of last resort and the representation of the international communities

The role of an MDA can be quite controversial as illustrated in a number of the cases. The main reason for this is the balancing act that the MDA's have to play between competing with the banks when they are not supposed to be

commercial institutions and getting involved in deals that may not be entirely economically viable or too risky. Nevertheless they have had some tremendous successes such as the Mozal project (Esty, 2003c) and the Chad Cameroon Petroleum Pipeline (Esty, 2003k).

6.3.6 OTHER INSIGHTS INTO PROJECT FINANCE STRUCTURES

The cases offer a number of other insights into the Project Finance structure. Something that may seem obvious at first but is necessary to mention is that uneconomic deals are not sustainable over the long term regardless of the financial structure. (Esty and Sesia, 2003b)

"While financial structure can improve firm performance and increase the probability of success, it cannot save a project with fundamentally flawed economics" (Esty, 2002b, p. 2) Despite the scale of some of the projects, the underlying economics are sometimes unsound such as in the cases of Iridium (Esty, 2002b), the Mobile Energy Services Company (Esty and Sesia, 2003b) and Restructuring Bulong's Project Debt (Esty and Kane, 2003a). In all these instances the parties made critical yet basic mistakes that led to the projects' demise.

Another important point that emerges is the need for a good fit between the various sponsors. It is even compared to a marriage. The sponsors also need to have a good relationship with the other main stakeholders such as the banks and legal advisors to the project (Esty and Ferman, 2003b).

When analysing a project it is useful to be able to classify projects into various types. This can aid in understanding the specific risks that a project faces as well as how to manage them. (See 6.5 below) There are two ways of classifying projects that are brought up in the cases. The first is Stock vs. Flow projects. In a Stock project there is a limited resource which will be processed and sold on. Typical examples of this are mines where there is a finite amount of a resource in the ground and the feasibility of the project depends on the amount and quality of that resource. By contrast a Flow project provides a service such as a toll road where there is no finite resource but the viability of the project depends on the level of traffic flow through the tollgates.

The second important classification is Wholesale vs. Retail. In a Wholesale project there are typically only a few buyers of the product from the project. An example of this is a power station where the project would sell the electricity to an entity that owns a transmission network (Esty, 2003i). The important element of these types of projects is that they are able to use off-take agreements that drastically reduce or shift the risk of the project. In fact "the majority of single asset Project Financing have been based on long term contracts under which credit worthy parties agree to purchase minimum quantities at fixed prices" (Esty and Kane, 2003a, p. 4). Retail projects, in contrast sell directly to the end consumer where an off-take agreement is impossible. These types of projects then rely on market studies which can sometimes be inaccurate leading to the failure of the project (Esty, 2003i).

6.3.7 SECTION SUMMARY

This section has dealt with the structuring of a project when using Project Finance, looking at the advantages and disadvantages of Project Finance, the determinants of capital structure and other points that are raised throughout the case studies. One of the most important financial tools in Project Finance is the project valuation. The following section deals with this aspect of Project Finance.

6.4 SECTION 3: VALUING PROJECTS

A valuation of the present value of the future cash flows of a project is critical to Project Finance where financing takes place on the back of the quality of those cash flows. As such a separate section has been dedicated to this topic.

The starting point of any valuation is the economic logic of the project. This means that there is no point in running large amounts of numbers and doing quantitative analysis if the economic logic demonstrating why this should work is not there. It relates back to the point made in the previous section regarding financial structuring that there needs to be a fundamental economic motivation for the project and if this is absent no amount of financial restructuring will solve the problem.

Once it is established that there is an economic logic to the project a comprehensive valuation needs to be done. This valuation needs to be

appropriate for the project and more complex projects require more complex valuation techniques. (Esty, 2003j) A number of more complex valuation models exist over and above the more commonly used Discounted Cash Flow model (DCF). Some of these are more complex iterations of DCF while others take a somewhat different approach.

6.4.1 THE DISADVANTAGES OF DCF

The disadvantages of the DCF method can be seen as the motivations for using other methods. These are (Esty, 2003j):

- DCF does not take into account growth options which may be an inherent part of the motivation for embarking on a project.
- The Weighted Average Cost of Capital (WACC) only works when a project or firm operates at a steady rate and when there are no special features such as subsidies in the capital structure.
- A single WACC can't detect changes in the amount and type of leverage and changes in the risk of the project. Significant changes in the risk profile and type of leverage used would affect the valuation of a project and using a single discount rate throughout the lifecycle of a project would inaccurately reflect the project value.
- Discounting should be done at market rates, not subsidised rates, which would be the case if the WACC of the project is dependant on special features of the sponsors or finance providers such as MDA's.

- For some types of debt the interest deduction does not equal the tax rate multiplied by the Cost of the Debt multiplied by the outstanding debt and therefore WACC will not pick up on all the tax shields in these cases.
- Weighting the WACC should be based on market values, not on a percentage of capital raised or expended and not on book value.
- WACC does not take into account the probability or effect of distress costs should the project default or go into distress. This will result in errors for highly leveraged firms, which is often the case in Project Finance.

6.4.2 USING MULTIPLE DISCOUNT RATES

One of the simplest ways of overcoming a number of these challenges in using DCF is by using multiple discount rates. Using single discount rates for certain types of projects are incorrect for the following reasons: (Esty, 2002b):

- In the life of a project the tax rate may change either because of changes in government policy or because of agreed conditions with the local government.
- The debt rates are promised not required rates of return as projects can often be restructured if needed. In other words the debt is not set against a required hurdle rate as a project within a firm would be. This is dealt with in-detail below, in the Financing Projects section.
- Capital structure changes over time as leverage changes which will affect the WACC.

- The capital structure weights are in book not market value.

To correct this, one can simply use multiple discount rates throughout the life of a project. For example an initial discount rate could be used for the initial construction phase where the project risk is at its highest and no revenue is being generated. A second, lower discount rate could then be introduced in the initial operating phase of the project where the risk has lowered somewhat and revenue is starting to be generated but the project may still be highly leveraged and not producing profits. Finally, once the project has reached a stable rate of operation, revenue and profits are somewhat consistent and the risk has been lowered, a third discount rate could be introduced. For more information on this technique, see Professor Esty's article, *Improved Techniques for Valuing Large Scale Projects* (1999).

6.4.3 REAL OPTIONS ANALYSIS

This doesn't solve all the challenges of DCF and for these reasons other valuation techniques have been developed. Real Options Analysis was developed to include a significant option in the valuation of a project. For example where there is a large uncertainty about the reserves of a mine and an option is given to develop the mine or walk away, which was the case in the Bidding for Antimina case study (Tufano and Moel, 1997). It is incorrect to compare a project where the intention is only to fully develop a project to a project where a 'walk-away' option exists. This option has a value to the developing firm because it will not have to expend the necessary resources in

developing the project further than a defined point. A further tool that is mentioned in the case which can be used for Options valuation is Monte Carlo Simulation. For more information on these techniques and tools see the Bidding for Antamina case study and accompanying teaching note (Tufano and Moel, 1997; 1998).

6.4.4 EQUITY CASH FLOWS (ECF)

The Equity Cash Flow valuation methodology is illustrated in the Texas High Speed Rail Corporation case study (Esty, 2003j). This methodology aims to value the equity that a sponsor or group of sponsors has in a project as opposed to the project itself. It is thus contrasted with Free Cash Flow (FCF) which is related to the project as a whole. The main advantage of this approach is that it "offers an escape from reliance on the WACC with its restrictive assumptions and unwieldy calculations" (*ibid*, p9). This is because the ECF approach uses an unlevered cost of equity as a discount rate for the equity cash flows. For further detail on this approach see Esty, 2003j p. 8-10, Exhibit TN-3, TN-4 and TN-5, p. 16-20.

6.4.5 THE ECONOMIC RATE OF RETURN (ERR)

An infrastructure project can often have motivations over and above the direct financial rewards of a project. This is especially relevant in a case of governmental projects where there is a social motivation for the project. In these cases a valuation technique will take other factors into account besides the financial benefits. Professor Benjamin Esty proposes a framework for

calculating the Economic Rate of Return (ERR) of a project and is illustrated in the case study Nghe An (Pronounced *'nay on'*) Tate and Lyle Sugar Company (Esty and Lysy, 2003a; 2003b). Esty has also published an article entitled "An Economic Framework for Assessing Development Impact" which assesses the differences between private and social returns or in other words the difference between an IRR and Economic returns (Esty, Lysy and Ferman, 2003).

The ERR is not simply a number although it is expressed partially in numbers. The important aspect is that, whether the ERR is positive or negative, the total social return needs to be understood even if it can't be quantified. The ERR is calculated using the sum of flows that are used to calculate the IRR (FRR) and the individual net returns to each of the other stakeholders. Before embarking on any project one needs to understand which groups are affected and by how much. This will effect the ultimate decision. This technique is especially important in developing or emerging markets where projects are often undertaken for motivations other than the financial returns from the project.

Despite the development of more accurate valuation techniques it is still a forecasting tool and limited to the quality of the information available and the rationality of the investors. Furthermore it is extremely difficult to value a large project with unproven technology and it is especially difficult to forecast retail demand as illustrated in the Iridium case study (Esty 2002b; 2003d). Nevertheless projects that use Project Finance often can predict future cash flows with a great deal of accuracy. The level of detailed analysis that is undertaken in Project Finance also ensures that measures are put in place to

warn the stakeholders if things are not going according to plan. For this reason a large part of Project Finance is Risk Management which is dealt with in the following section.

6.5 SECTION 4: MANAGING PROJECT RISK

As mentioned above in 6.2, one of the major advantages of Project Finance and a main motivation for its use is risk management. This section looks firstly at the types of risk that exist in the Project Finance arena and then explores the various tools and strategies for managing project risk.

6.5.1 TYPES OF RISK

There are five major types of risk identified in the cases although the major emphasis is less on categorising the risk and more on identifying risks and finding mitigation strategies for them.

They are (Esty and Sesia, 2003b):

1. Construction or completion risk,
2. Sovereign or political,
3. Financial risk,
4. Operating risk including market and contract risk, price risk, quantities throughput risk and management risk
5. Other risks including force majeure and environmental risks

There is however a focus on sovereign risk which emerges from the Chad-Cameroon Pipeline (Esty, 2003k) and Mozal (Esty, 2003h) case studies. These are particularly relevant to emerging and developing markets such as South Africa. One of the key questions that need to be addressed in these situations is: how much risk is acceptable in desperate situations? Often developing countries can pose intricate ethical dilemmas for investors where there are large potential social benefits from a project but high risks that accompany them (Esty, 2003k).

In order to deal with these risks it is imperative that comprehensive and innovative risk mitigation strategies are employed to manage the particular risks of a project.

6.5.2 A BRIEF INTRODUCTION TO RISK MANAGEMENT

There are two types of risk management (Esty, 2003f): Risk sharing with other parties who can bear them more cheaply or manage them more effectively and risk mitigation or reduction. In large scale projects this second method is generally used through bi/multilateral organisations.

Risk Management can be looked at in three stages (Esty, 2003j):

1. Identification of risks
2. Assessment of the potential impact of the risks and
3. Mitigation of the risks

From this perspective the goal of risk management is carving up risk and returns to achieve greater efficiency. There is a limit, though, as to how much efficiency can be achieved because risk mitigation is a continuum at some point in which the costs will outweigh the incremental benefits (Esty, 2003i).

6.5.3 IS PROJECT FINANCE RISKIER THAN CORPORATE FINANCE?

When dealing with the issue of risk in Project Finance it is important to distinguish between the perception of risk in this area and the actual risk that exists in these projects. This can be expressed in the question, is Project Finance riskier than corporate finance? While this may seem to be a purely philosophical debate, it became a tremendously practical issue when the Basel II accord initially proposed large increases in the capital risk weightings of Project Finance loans. This was one of the major differences between Basel I and Basel II and emanated from the regulators' perception that Project Finance is by nature riskier than Corporate Finance. This issue was dealt with briefly in 1.7 and 5.2.4.5 above. Here however it will be dealt with in further detail as part of the theory of managing project risk.

There are two reasons why Project Finance would seem riskier to an outsider, and in this case an outsider is not someone who is completely uninvolved in the finance industry but rather anyone who does not work directly in Project Finance as was the case with the Basel II regulators. The first reason is that many Project Finance projects take place in developing countries where the risk

profile is higher than when compared to Corporate Finance deals done in developed markets. The second reason is that several high profile cases have resulted in default and liquidation such as Iridium, or perhaps it is the liquidation that caused the high media profile. Either way these cases create an impression in the minds of those working outside of Project Finance that it has a higher risk profile than Corporate Finance.

A number of international banks formed a committee to challenge the proposals of the Basel II accords. This committee set out to determine three things:

1. Is there a higher probability of default (PD) in Project Finance loans when compared to Corporate Finance Loans?
2. Is there a greater loss in Project Finance loans than in Corporate Finance loans when default does occur, termed the Loss Given Default (LGD)?
3. Is there a correlation between the PD and the LGD in Project Finance and if so, how does this compare to Corporate Finance?

The committee found, given the data they had access to, that project loans have a ten year cumulative PD of 7.63% while corporate loans have 9.38%. This was done using a broad definition of Project Finance. Using a narrower definition brought the PD down to 3.68%. The LGD on Project Finance loans was found to be 25% compared to approximately 50% on corporate loans (Esty and Sesia, 2003a; 2003d).

It should be noted that this is not the only way to measure risk and that the vast majority of banks do not measure their risk in this way. Within the committee there were extensive debates around the results. However, as a result of the study the Basel II committee revised its proposal for capital adequacy ratios for Project Finance loans which were a great deal lower than before. Furthermore what emerged is that having high default rates is a strength of Project Finance because they serve as an early warning sign, as opposed to Corporate Finance where default generally triggers liquidation (Esty and Sesia, 2003a; 2003d).

6.5.4 RISK MANAGEMENT TOOLS AND STRATEGIES

There are no simple answers for mitigating severe risks in large projects, however this section presents the necessary points to consider in developing risk management strategies.

In the case study on Poland's A2 Motorway toll road, Esty (2003j, p. 9-13) proposes five rules for developing a risk management strategy. They are:

- Rule 1: Allocate the risk to the party that controls the risk or has the greatest impact on its outcome.
- Rule 2: When possible and it is cost effective to do so, write a detailed contract specifying the required actions, quality, and performance. Contracts work best when the risks are predictable, outcomes are verifiable and contracts are enforceable; otherwise give equity to drive the right behaviour. In Project Finance there is an important distinction between risk and

uncertainty. Risks can be mitigated, analysed and forecasted but uncertainty cannot. "Predictability is not common in Project Finance" (ibid, p10) and therefore uncertainty affects projects more than risk. This is why managing such large projects is so difficult.

- Rule 3: Allocate risk to the party that can bear it at the least cost.
- Rule 4: When negotiating, contracting and other transaction costs make complete contracting unfeasible, use residual risk to align incentives and induce optimal behaviour i.e. when risks are non-marketable, the primary strategy is to bear them.
- Rule 5: To the extent possible, debt should bear more downside risks and equity should bear the upside risks.

6.5.5 MITIGATING SOVEREIGN RISK

The original approach to mitigating political or sovereign risk was to add a risk premium when investing in emerging markets. This was a fairly common practice but the problem was that it increases the hurdle rate. This can make a project susceptible to what Wells (1998), cited by Esty (2003h) calls the "paradox of infrastructure development." In other words by trying to get higher returns to compensate for investing in a risky country, these higher returns can seem excessive and make the project more vulnerable to sovereign action against the project. Today therefore it is more common to mitigate risk through project selection, insurance and structuring.

In terms of sovereign risk there are a number of effective ways of mitigating this risk (Esty, 2003h). Sponsors should use international partners. This will ensure that any act of even partial expropriation will have international consequences and can even render the project worthless in the event of expropriation because all or most of the supplies emanate from outside the country. High Leverage can also be used to mitigate sovereign risk. It allows for greater participation by international banks, ensures cash balances are kept low and it provides an implicit threat against expropriation in that there is little for the government to expropriate without jeopardising the project. Furthermore host countries have a good record of honouring foreign debt even after foreign owned projects have been nationalised.

It is often important to involve MDA's. As lenders of last resort borrowers are less likely to act adversely against them. They can reduce costly imperfections through bringing cheaper finance to the project. This is in contrast to Modigliani and Miller who state that in a perfect world value does not depend on capital structure. Market imperfections make structure count in that agency costs, transaction costs, taxes, asymmetries of information and financial distress costs mean that certain structures will be more susceptible to these costs than others.

Bilateral Development Agencies (BDA's) can offer information about the borrower, decreasing the asymmetry of information and monitoring progress by appraising the deals, structuring the deals, acting as an honest broker and ensuring a fairer deal that decreases the probability and cost of distress. They also can finance deals which encourages further investment through what is

called the demonstration effect and, as mentioned above, deterring sovereign interference.

Another way to mitigate sovereign risk is by being financially involved in related operations. This creates value elsewhere in the value chain through transfer-prices and fees which will ensure that external stakeholders of the project see value in the project.

When operating in a foreign environment it is important to get a local partner. This will create an environment of success that benefits the local communities and will aid in efforts to increase the real and perceived benefits. This often needs the development of innovative forms of agreement that accommodate the needs of both the investor and the local partner. It will also ensure that local business and the government benefit when the project does well. Ideally the project should be located near developed nations where the project sponsors are domiciled. This can act as a type of political risk insurance.

It should be noted that many of these strategies don't actually mitigate risk but rather shift it to another party that is better able to bear it. When considering political risk it should be noted that investor ratings fail to recognise that not all projects are equally susceptible to political risk. One needs to look at the direction of the risk, whether the local situation is improving or not, as opposed to simply looking at the history of the country or government (Esty, 2003h).

Sponsors also need to look beyond the stakeholders of the project and plan and adopt strategies for dealing with interest groups and social activists. Despite the best intentions project sponsors can, for example, be accused of exploiting developing nations in full page adverts in the New York Times (Esty, 2003k).

6.5.6 OTHER GENERAL RISK MANAGEMENT STRATEGIES

There are a number of other methods that can be used to manage risk in large scale projects. These include organisational form, contracting and corporate governance.

6.5.6.1 ORGANISATIONAL FORM AS A RISK MANAGEMENT TOOL

Organizational form, in particular in Project Finance, can be used as a risk management tool. By creating a special purpose vehicle for a project, the risk is isolated from the sponsor's balance sheet and thereby reduces the risk to the stakeholders. This is a relatively new concept in the field of finance because it is counter-intuitive. Normally it is assumed, at least according to portfolio theory, that specialisation is higher risk and diversification is lower risk (Esty, 2003f). Whereas here the strategy is not to diversify risk by owning a number of projects, some of which may fail but the majority of which will succeed, rather it is to isolate the project and specialise, as it were. This does increase the risk of the project but decreases the risk to each of the stakeholders.

6.5.6.2 CONTRACTING AS A RISK MANAGEMENT TOOL

One of the advantages of Project Finance is that it is easier to write high power managerial contracts and manage performance due to the nature of the projects as highly focused and leveraged entities (Esty, 2001c). However, while Project contracts are constructed to allocate risk, despite all the time and effort put into constructing them, they may still be incomplete (Esty and Kane, 2003a). Furthermore, once the contracts have been completed, an analysis of the actual operating contracts can help to identify points of vulnerability in a complex business relationship (Esty and Sesia, 2003b).

A particular area which arises often as a point of contention in project contracts is the definition of completion. The reason for this is that it defines when the risk transfers from one party to another. For example Project Finance norms in the definition of Completion in an EPCM contract is when the plant is operating at its intended commercial rate and efficiency level and not when the structure is complete. This therefore shifts more risk onto the builder, who not only has to ensure that the structure is fully built but that it reaches operational performance criteria as well (Esty and Kane, 2002).

6.5.6.3 FINANCIAL STRUCTURING AND RISK MANAGEMENT

When developing the financial structure of a project certain risks should be kept in mind. A burdensome financial structure can hinder management's ability to resolve inevitable delays that occur in large projects. Financial structures need

to have sufficient flexibility built into them in order to deal with delays and to fund incremental, but essential, expenditures. One of the ways of managing this is to allow for committed liquidity facilities that could provide cash injections in the event of early operating cash flows falling short of projections (Esty and Kane, 2002).

Project Finance also illustrates the relationship between risk and reward through its financial structure. As leverage increases the Debt Service Coverage Ratio will decrease, because of the higher payments needed to service the debt. The Internal Rate of Return (IRR) will increase in turn because of the higher leverage. From this it can be see that there is a trade off between project financial risk, being the risk of defaulting because the debt payments are higher, and the sponsor returns, because the sponsor can capture more of the value by not needing to give away additional equity (Esty, 2001c).

6.5.6.4 DIVERSIFICATION OF SUPPLIER AND CLIENT BASE

A classic problem in Project Finance is a bargaining situation between bilateral monopolists and the potential for opportunistic behaviour. In other words, when a project or deal is conducted where both the supplier and the client are monopolists, in that there is only one supplier of the product and only one buyer, the opportunity arises for one side to act opportunistically. The Mobile Energy Services Company case study (Esty and Sesia, 2003a) provides an example of where the MESC was the only provider of energy to a single client (See also 5.2.3.4 above).

One of the points that this case illustrates is that vertical separation can jeopardise an integrated manufacturing process. There is an inherent risk in transforming a company from a vertically integrated structure to a vertically separate structure with different owners because they then have different interests. In this case the decisions made by bilateral monopolists can differ dramatically from the decisions that would be made under unified ownership.

6.5.6.5 CORPORATE GOVERNANCE AS A RISK MANAGEMENT TOOL

Corporate Governance is a topic that has been discussed and researched widely outside the ambit of Project Finance. However, when looking specifically at the governance of large projects, Jensen (1993), cited by Esty (2002b), brings three principles that can be used to aid in the efficient governance of a project.

Firstly, in terms of board size, empirical evidence suggests that there is a negative correlation between firm value and board size. The main reason given for this is that smaller boards tend to use pay-per-performance and fire CEO's following poor performance. Secondly, in terms of board composition, there is a need for a level of independence of the board members. There is a positive correlation between the number of independent board members and different types of firm performance. The third principle is that board members should have equity ownership in the project. Many studies show positive correlation between inside ownership and firm value but this has been challenged.

6.5.7 FACTORING IN CYCLICALITY

Where possible cyclicality should be built into projections in industries where this is prevalent. This will assist in managing the risk of downturns in the industries in which the project operates. The question is, however, how should this be done? There are a number of ways of doing this such as using a back-cast of historical prices or forecasts of cycles based on economic data. As with all forecasts, questions arise as to how big the cycles should be and how long they should last? While there are no easy answers for these questions there are established methods such as ‘Standard and Poor's Factoring Cyclicality into Corporate Ratings’ (Esty, 2003m).

6.5.7.1 OTHER RISK MANAGEMENT TOOLS

The case studies also illustrate a number of important points that can reduce risk in large scale projects. In terms of the type of project, it is much more difficult to execute a retail project, partially because there is very little chance of an off-take agreement; in other words, the sponsors have to bear that risk. A project sponsor should attempt to ensure that even in retail projects there is some type of sharing or mitigation of the market risk. For example a toll road may be able to obtain some type of traffic guarantees from the government. This has been discussed above in the previous section, in 6.3.2 and 6.3.6.

This caution should also be used when financing technology projects. Large projects typically take longer than five years to develop and in the technology space a lot can change in five years. This was the case with Iridium which took eight years to develop and by the time it did, the product was close to being obsolete (Esty, 2002b). The question then remains: How should large, green-field technology projects be funded? This is not answered explicitly in the case studies except to take into account the risk management strategies identified above.

A further point is that even in large projects one must avoid the hype that can be generated in the market. This was clearly illustrated by the Iridium case study (Esty, 2002b) where all parties including the analysts forecasted the project to be hugely profitable and yet it was also subject to the technology hype of the late 1990's. A further example is the Australia-Japan cable which was also subject to the same hype and ended in the bankruptcy of one of the main sponsors (Esty and Ferman, 2003a; 2003b).

In projects of this scale it is important to involve people who are experienced in the field in which the project is operating. A lack of experience can lead to unrealistic assumptions, reliance on others' key judgements and execution errors as was the case with the Bulong mine (Esty and Kane, 2003a).

6.5.8 SECTION SUMMARY

Risk management is a key motivation of Project Finance. This section has looked at the types of risk that can be encountered in large scale projects as well as tools and strategies for mitigating those risks. Yet, while Project Finance mitigates risk, it does this, not only from a legal perspective but also, as a financing structure. The following section looks at how large scale projects are financed.

6.6 SECTION 5: FINANCING PROJECTS

The *sine qua non* of Project Finance is non-recourse debt and while there are many aspects and advantages to Project Finance, it is, after all, a financing mechanism for large scale projects (Esty and Sesia, 2006). This section explores the various mechanisms for and approaches to funding these projects and the advantages and disadvantages of each. Market Imperfections appear in all the financing strategies of the case studies and are critical determinants of financial strategy (Esty, 2002b).

6.6.1 BANK DEBT VS. BONDS

There are two ways to privately fund large scale projects: bank funding and bonds. Each of these has various advantages and disadvantages that make them more or less appropriate depending on the project. Often these aspects

are mirror images of each other in that what is an advantage for one is a disadvantage for the other.

The main advantages of bank debt are that it can be raised in relatively small amounts and credit lines can be drawn on as needed. This can be used to match a project's cash inflows with its cash outflows. It also takes place privately and there is no disclosure beyond the immediate stakeholders of the project. In issuing the debt the bank will conduct an external review of the project which helps prevent negative NPV investments. The fact that the bank is overseeing the project also assists to curb managerial excesses and force efficient liquidation if the project does fail. The fact that the bank will, at some point, force liquidation also prevents throwing bad money after good. The pressure of this debt can also be used to solve problems that can't be solved with contracts and aligns the interests of shareholders and management as discussed above in the advantages of Project Finance (Esty, 2001c).

In Project Finance, default often does not trigger seizure of assets but rather acts as a trip-wire to alert the bank that something in the project is not going according to plan. Action can then be taken to ensure that more is not lost. In this way default can promote corrective action in a change of strategy or management or both (Esty and Sesia, 2003a and 2003d). Bank debt also has lower issue costs than bonds and according to Gilson, John and Lang (1990), cited by Esty and Sesia (2003d), it is easier and cheaper to renegotiate if there are problems.

The disadvantages of bank debt are that it generally has a shorter maturity than project developers would ideally like; it often has restrictive covenants that mitigate the risk of the bank such as high Debt Service Coverage Ratios (DSCR), are limited in size depending on the banks appetite for risk, interest rates vary and the banks are not willing to take on construction risk or the effect of fluctuating commodity prices. Bank debt can also take longer to arrange due to the extensive analysis that the banks require to be carried out before issuing such large amounts of debt.

Conversely the advantages of bonds are that they have long maturities, fixed interest rates and fewer, more flexible covenants. Furthermore they are available in large amounts up-to whatever the market is willing to take. This can also be a disadvantage if the project does not require such large amounts of capital. A further disadvantage of bonds is that they take place in a public arena and require disclosure of large amounts of information.

For these reasons projects often look to issue private placement bonds, which have the advantages of public bonds in that they are quicker to arrange but do not require public disclosure of information. These, however can only be sold to institutional investors (Esty, 2001c).

6.6.2 SYNDICATED BANK LOANS

Syndicated bank loans accounted for eighty percent of global project debt in a total market size of over US$1 trillion in 2003. Nevertheless there are very few

concise descriptions of syndicated lending and only a few empirical studies on this topic. However a simple description is that due to the size and nature of large scale projects, banks often are unable or unwilling to carry an entire project loan on their balance sheets. As such, in many cases a bank will syndicate a loan. In each syndication there will be a lead bank that designs the syndication strategy and often underwrites the loan. There will be a number of tiers of banks under the lead arranger who play less active roles in the project and hold smaller percentages of the loan.

In designing a syndication strategy the arranging bank needs to decide how many banks to invite into the syndicate, which banks to invite, what fees to offer the other banks and what share of the loan to retain. In this process relationships are of utmost importance in choosing which banks to invite and include in the syndicate.

There is a 'rule of thumb' that the lead arranger should hold approximately 10% of the loan on its balance sheet, but empirical evidence shows that arranging banks hold larger positions of riskier loans than the rest of the syndicate. In good quality projects the challenge that often arises is that a loan is oversubscribed, meaning that the banks invited offer to lend a total amount that is larger than the amount required for the project. When this happens there is a need to reduce all of the commitments including the sub-underwriter's commitment. This should be done using 3 criteria:

1. Fairness: The lead arranger should try to keep the amount given as close as possible to the original amount requested.
2. Consistency: Within a certain tier there should be a similar rate of scale-back for each of the banks.
3. Client considerations: The borrowers' wishes should be included when deciding to include or exclude a specific bank.

When a deal is oversubscribed it is considered a success, but there are elements of failure in both under and oversubscribed deals. Over-subscription is a show of confidence but it can also indicate that either the borrower or the lead arranger is overpaying. However if there is a choice one should rather err on the side of over subscription (Esty, 2003b; 2003g).

6.6.3 THE SEQUENCE OF RAISING DEBT

In large scale projects debt sometimes needs to be raised in stages. In these cases various paths can be chosen in which to raise the debt. Each of these paths of capital raising will have different effects on market imperfections such as agency costs, transition costs, taxes, and financial distress.

There are many ways in which debt raising can be done however there are four broad sequences in which debt can be raised. For a diagrammatic representation of these paths see Figure 2 below reconstructed from the Iridium Case Study Exhibit TN-7 (Esty, 2002b).

The first way is to start with 100% debt and then slowly add equity. The major disadvantage of taking this path is that it creates incentives for equity holders to increase asset risk because they do not currently have any equity in the project and will only put in the equity at a later stage if the project makes progress. This is called risk shifting or asset substitution. There would also be the problem of under-investment due to debt overhang. In other words this would use up a large proportion of debt capacity and managers would choose not to invest even in positive NPV projects. Furthermore it creates a high probability of financial distress.

The second option, in light of the severe disadvantages of the previous one, would be to start with some equity and slowly add debt. This allows the project to match debt inflows with capital expenditure, as noted above in the advantages of bank debt. It thereby avoids negative arbitrage caused by raising large lump sums of capital in that there is an opportunity cost of the capital not used for the project which will be inefficiently invested while waiting to be used. The major problem with this approach is that it is extremely costly to raise funds in small increments, incurring fees each time, and doesn't take advantage of the economies of scale of large capital raising.

The third approach is to start with equity and add a large amount of debt and then some more equity later if needed. This approach follows the Pecking Order Theory of Capital, referred to in 6.4.3.2 above, which states that firms prefer internal capital to external capital because of information asymmetries. To the extent that is possible, therefore, firms will use internal capital, namely equity,

and only then raise debt. Even when raising debt the firm will issue the least information intensive capital first. Therefore the preferred type of debt is senior, short term debt, then junior, long term debt, and only then, if needed, give away equity to other parties. The problem with this approach is, again, the danger of underinvestment due to the debt overhang problem as a result of the large levels of debt taken on for the project. So while companies might prefer this path, creditors will not.

The fourth path which is the most commonly used is to start with some equity, add more equity when needed and then add large amounts of debt. This ensures sponsor commitment, minimises transaction costs, avoids potential problems with debt overhang and risk shifting as far as possible and reduces the probability of distress (Esty, 2002b).

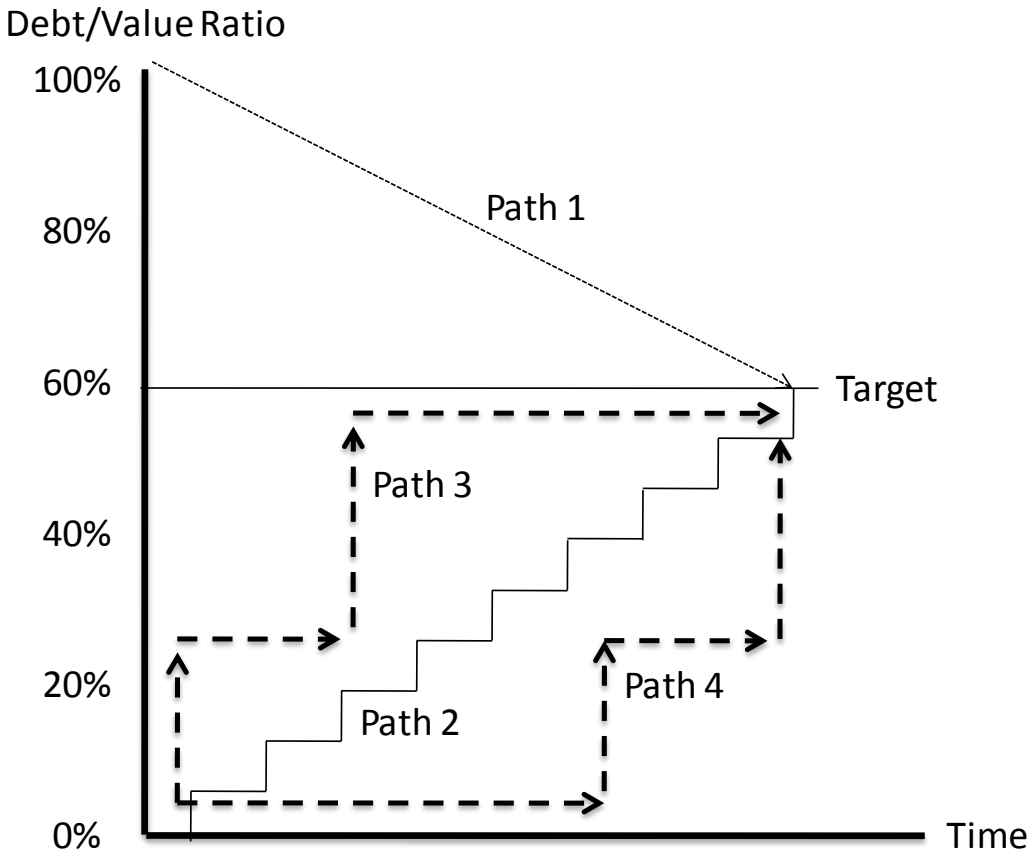

Figure 2: Four Possible Sequences of Raising Capital

6.6.4 THE BRIDGE LOAN THEN BOND STRUCTURE

In practice there is a further way of financing a project using the 'Bridge loan then bond' structure. Here a firm would use a short term bridge loan to initially fund a project, which would have a relatively high interest rate, and then once the project is operational refinance the project with a bond. The major risk of this approach is that it is difficult to refinance loans in volatile markets so a firm cannot be certain that it will be able to refinance a project (Esty 2003b; 2003g).

6.6.5 REVOLVING CREDIT FACILITIES

A variance of debt financing is a ‘revolving credit facility’ where a large facility is set up which can be accessed over and over again. This was used by the Calpine Corporation to construct a number of power plants using non-recourse debt without having to finance each plant separately. It effectively allowed the power utility to construct plants in a ‘circle’ and increase the ‘velocity of money’ used in this process (Esty and Kane, 2003d; 2003e). (See also 5.2.1.3 above)

6.6.6 ISLAMIC FINANCE

An emerging form of finance in the world today is Islamic Finance driven by the growing Muslim population and the need for infrastructure in Islamic countries. Islamic countries account for approximately 10% of global Gross National Product (GNP) and Islamic financing has been growing at between 15% and 20% per anum. As such there is a growing need to understand the Islamic culture, traditions and financial systems (Esty, 2003m; Esty, Qureshi and Millet, 2000). In that much of Islamic finance is being raised to build infrastructure, it has an important link with Project Finance.

6.6.6.1 FINANCIAL PROHIBITIONS IN *SHARI'AH*

Islamic finance is based on the principles of *Shari'ah*, the 'ever-expanding interpretation of Islamic religious law.' There are four main prohibitions under *Shari'ah* that distinguish it from conventional, western finance. The first is the prohibition against interest or *riba,* which aims to prevent exploitation and increase social benefits. Profit is defined as the just return of someone who accepts the risks of ownership, and is therefore allowed.

The second prohibition is against uncertainty in contracts, referred to as *gharar*. This prohibits selling anything in a contract that cannot be accurately described. For example a building cannot be sold until it is built. In a project Finance deal this can become extremely complex when trying to sell equity in a project that has not been fully constructed yet (Esty, *et al*, 2000). In the Equate Project, described in 5.2.4.2 above, specific parts of the refinery such as the boilers had to be sold, as opposed to simply allocating a percentage of equity to a party (Esty, 2003).

The third prohibition is against gambling or *Masir* because it can lead to the immorality of the compulsion to gamble and social evils such as poverty. This is relevant when dealing with modern financial instruments such as futures and options due to their speculative nature. These instruments often form critical elements of resources related projects and would pose a problem in those cases.

The fourth prohibition, or rather group of prohibitions, forbids the use of certain products such as pork and alcohol as well as commercial transactions that benefit from these products. While this is a less common problem in Project Finance it still needs to be taken cognisance of.

Each of these prohibitions are quite simple in concept but can be extremely complex in practice and can lead to extensive debates that need to be resolved by *Fiqh* academies made up of Islamic legal and religious scholars (For further information on Islamic finance see *An Introduction to Islamic Finance* which also describes the various equity-and-debt-like financial instruments that have been developed based on the above principles (Esty, *et al*, 2000).

6.7 CHAPTER CONCLUSION

Following the summaries of the relevant case studies in Chapter 5, this chapter has presented an analysis of the principles of Project Finance, in each of the five areas of Project Finance, established in the Literature Review above. This concludes Phase 1 of the research.

The question that remains in this research is how do these principles relate to Project Finance in South Africa and the markets that South African Project Finance professional's service? To answer this question, seventeen interviews were conducted with South African Project Finance, industry experts. The results of these interviews are presented in the following chapter followed by an analysis of these results.

7. CHAPTER 7: PHASE 2, INTERVIEW RESULTS

7.1 INTRODUCTION TO INTERVIEW RESULTS

The previous two chapters presented the theory that currently exists on Project Finance based on international case studies. This chapter goes beyond the theory of international Project Finance to test the relevance of that theory to South Africa. As mentioned above in the Methodology section, sixteen interviews were conducted with industry experts who are involved in Project Finance in South Africa. This chapter sets out the results of these interviews which will then be discussed in the following chapter. The questionnaire that was used for the interviews consisted of twenty four questions broken down into the five theoretical sections used in the two previous chapters.

When reading these results the reader should be cognisant of a number of caveats over and above what has already been mentioned in the methodology section:

- The figures here represent opinions, not necessarily fact, and the validity of the information stems from the individuals' expert status.
- Due to time constraints and the fact that certain individuals focus on certain areas of Project Finance, not all questions were dealt with in every interview.

- Furthermore as the interviews progressed the researcher focused on certain questions which seemed to be more pertinent in the previous interviews.
- The researcher instructed the respondents to answer from their own perspective and as such there was little attempt to look at other perspectives during the interviews.
- Using the 'snowball effect' meant that the interviews were not spread evenly across the different sectors. So, for example, a disproportionate number of the interviews were with individuals working in the banking sector as these were the easiest to identify and access. Each of these individuals then tended to recommend further potential interviews from colleagues in their own industry.
- A list of the interview respondents appears in Appendix 1.

7.2 DEFINING PROJECT FINANCE

The questions in this section aim to ascertain the view of what Project Finance is, amongst experts in the South African Project Finance industry. As mentioned above, in Chapter 1, there is no agreed upon definition of Project Finance and it is often misunderstood. The second question goes on to explore whether non-recourse debt is the defining characteristic of Project Finance, as stipulated in the theory. This would then enable an agreement as to the defining characteristic of Project Finance, if not an agreed definition.

7.2.1 HOW DO YOU DEFINE PROJECT FINANCE? DO YOU HAVE A STANDARD DEFINITION AND IF NOT HOW DO YOU DECIDE WHAT IS PROJECT OR CORPORATE FINANCE?

None of the respondents used a standard definition of Project Finance. All, however, did identify what they believed to be defining characteristics of Project Finance. The table below shows the characteristics identified and the number of respondents who mentioned them in defining Project Finance.

Defining Characteristics	*Frequency*
The debt is serviced by the cash flows of the project	7
There is limited recourse to assets	6
The project is placed in an SPV	3
There is sub-investment grade financing	1
The time to completion is longer than a Corporate Finance deal	1
Structuring a project for tax benefits by using high leverage	1
It is structured around project risks	1
A single asset is being financed	1
The sponsors issue a guarantee	1

Table 3: Defining Characteristics of Project Finance

7.2.2 WOULD YOU AGREE THAT THE DEFINING CHARACTERISTIC, THE *SINE QUA NON,* OF PROJECT FINANCE, IS NON-RECOURSE DEBT?

This question was asked second so as not to bias the answer to the first question towards non-recourse debt. The table below illustrates the responses to the above question.

Answer	*Number*
Yes	12
No	3

Table 4: Non-recourse debt as the sine qua non of Project Finance

There were four main comments that were made in the interviews regarding this question:

- The characteristic of non-recourse debt, as a distinguishing factor from other types of finance, has been prominent to in recent years due, to a large extent, to the liquidity in South African financial markets.
- Within South Africa the government plays a pivotal role in financing large projects such as the Gautrain and uses the Public Private Partnership (PPP) framework. For this reason most large infrastructure projects have little limited-recourse debt and almost never have non-recourse debt.
- The fact that South Africa is a developing country also makes it difficult to have pure non-recourse debt as one would be able to in a developed country. Limited recourse debt is therefore much more common.

- An issue that was raised a number of times in the interviews was Black Economic Empowerment (BEE). In terms of this question, the ramification is that there are instances where the individuals involved in a Project Finance deal are there as BEE partners and require 100% of the finance from debt because they have no equity.

7.3 STRUCTURING PROJECTS

The questions in this section aim to explore Project Finance as a financial structure. They start off by exploring the benefits of and motivations for using this structure as opposed to other structures. They then explore the role of MDA's in this structure, who are not always present and whose role is not always obvious or consistent across various projects. This is in opposition to the sponsors, financiers and lawyers whose roles are better defined and consistent across projects. The questions then explore the fundamental economics of the structure that are necessary for a project to go ahead followed by looking specifically at capital structure. This is an important issue in Project Finance given that, according to the theory cited above in chapter 6, non-recourse debt is the defining characteristic of Project Finance and that high leverage is often used in these circumstances (Esty, 2006a), as discussed above in Chapter 5.

7.3.1 WHAT ARE THE MAIN REASONS WHY YOU OR YOUR CLIENTS USE PROJECT FINANCE?

The table below illustrates the answer to this question and the frequency with which they were cited across the interviews.

Reason	*Frequency*
To do projects that are larger than the balance sheet can support	14
To keep debt capacity open	7
To manage political risk	3
For risk management purposes, mainly to isolate the balance sheet from contamination	2
To fund start-ups	1
Disparate Shareholders that want extensive due diligence e.g. distrust of Private sector by government	1
To manage foreign currency exchange risks	1
Tax structuring	1
Contractual Frameworks	1
Natural outflow of PPP Framework	1
Take advantage of strong revenue streams	1
To access finance before it becomes available from the fiscus	1

Table 5: Reasons for Using Project Finance

7.3.2 WHAT DO YOU SEE AS THE DISADVANTAGES OF USING PROJECT FINANCE?

The table below lists the disadvantages of Project Finance that were identified in the interviews, in order of the frequency with which they were mentioned.

Disadvantage	*Frequency*
Long implementation timeframe	9
High upfront costs (fees)	5
More expensive debt	4
Complexity of the deals	2
Not appropriate for small deals	2
The need for layering of debt	1
Perception of extra costs	1
Cannot cross collateralise	1
Long time till draw down of funds due to extensive due diligence that is done upfront	1
Need for sponsor equity, in nominal terms, more than Corporate Finance	1
Volume of work needed to complete a deal	1
Loss of flexibility	1

Table 6: The Disadvantages of Project Finance

7.3.3 DO YOU INVOLVE MULTILATERAL DEVELOPMENT AGENCIES (MDA'S) IN YOUR PROJECTS AND IF SO FOR WHAT REASONS?

The table below shows which respondents of the 16 used MDA's in their projects.

Answer	*Frequency*
Yes	12
No	4

Table 7: Involving MDA's

Of those that did use MDA's, there were various motivations for including them. The table below lists these reasons and the frequency with which they were cited.

Reason	*Frequency*
To mitigate political or sovereign risk	5
To access cheaper debt	3
To bring government 'clout'	2
Credibility	2
Provide first loss positions	2
Less restrictive regulations than banks	1
Longer tenures of debt	1
Credit enhancement	1
To fund feasibility study	1
Take into account social and environmental implications	1
Diversify Funding	1

Table 8: Reasons for Using MDA's

7.3.4 PLEASE COMMENT ON THE FOLLOWING QUOTE: "UNECONOMIC DEALS ARE NOT SUSTAINABLE OVER THE LONG TERM REGARDLESS OF THE FINANCIAL STRUCTURE."

All the respondents that were asked this question agreed with it, as illustrated in the table below.

Answer	*Frequency*
Agree	10
Disagree	0

Table 9: Uneconomic Deals

7.3.5 WHAT DO YOU FIND ARE THE MOST IMPORTANT DETERMINANTS OF CAPITAL STRUCTURE IN PROJECT FINANCE DEALS?

Determinant	*Frequency*
Volatility in the revenue line and security of the cash flows	5
The extent or presence of off-take agreements	3
The level to which risks have been mitigated	3
Current interest rates	2
Market risk	2
Credibility of the sponsor(s)	1
The size of the Sponsor's Balance Sheet	1
The presence of local Partner	1
The presence and extent of the due diligence	1
The flexibility of the project	1
The presence and extent of the debt covenants	1
Market experience	1
What the banks dictate	1

Table 10: The Determinants of Capital Structure

7.4 VALUING PROJECTS

As a key tool in Project Finance, this section explores the use of valuations in the South African project Finance Industry. It explores the starting point and the necessary complexity of a valuation, followed by looking at the use of multiple discount rates and different valuation techniques such as Real Options Analysis

7.4.1 WOULD YOU AGREE THAT "THE STARTING POINT OF ANY VALUATION IS THE ECONOMIC LOGIC OF THE PROJECT" AND IF SO, WHY?

As the table below illustrates all respondents that were asked this question agreed that the economic logic of a project of the starting point of its valuation.

Answer	*Frequency*
Yes	7
No	0

Table 11: The Starting Point of a Valuation is its Economic Logic

All the respondents that were asked this question felt that it was an obvious part of valuation methodology and felt it unnecessary to justify.

7.4.2 WOULD YOU AGREE THAT MORE COMPLEX PROJECTS REQUIRE MORE COMPLEX VALUATION TECHNIQUES?

The response to this question was somewhat mixed as illustrated in the table below.

Answer	*Number*
Yes	2
No	6

Table 12: More Complex Projects Require More Complex Valuation Techniques

7.4.3 DO YOU EVER USE/ASK FOR YOUR SERVICE PROVIDER TO USE MULTIPLE DISCOUNT RATES IN YOUR VALUATIONS?

The answers to this question were also mixed as illustrated in the table below.

Answer	*Number*
Yes	6
No	5

Table 13: Using Multiple Discount Rates

7.4.4 WHAT VALUATION TECHNIQUES DO YOU USE?

Only three types of valuation techniques were used by the respondents for valuing projects. The table below illustrates the number of interview respondents that used each type.

Valuation Technique	*Frequency*
DCF	11
PE	2
ERR	1

Table 14: Valuation Techniques

7.4.5 DO YOU EVER USE OTHER MORE COMPLEX METHODS SUCH AS REAL OPTIONS ANALYSIS OR MONTE CARLO SIMULATION? WHY OR WHY NOT?

While three of the respondents said that they did use more complex methods of valuation they were all internally focused for capital weighting purposes and not to value projects. This is illustrated in the table below.

Answer	*Frequency*
Yes	3
No	8

Table 15: Using More Complex Valuation Methods

The reasons cited for using these more complex methods are laid out in the table below with the frequency with which they were mentioned. The reasons are not mutually exclusive.

Reasons Given	*Frequency*
Used for Internal capital weighting	2
Commodity price forecasting	1
Used for demand side risk	1

Table 16: Reasons for Using More Complex Valuation Techniques

Over and above these responses, one respondent said that they should use these but currently do not.

7.5 MANAGING PROJECT RISK

It was established in Chapter 5 above that risk management is one of the major motivations of Project Finance. This section surveys what the most common risks are faced in South African project Finance. It goes on to explore the role of contracts as a risk management tool, the fundamentals of risk management methodology and finally the definition of completion of a project, the major point of risk transfer from the developers to the owners.

7.5.1 WHAT ARE THE MOST COMMON RISKS FACED IN SOUTH AFRICAN PROJECT FINANCED PROJECTS?

The table below illustrates the frequency of the risks cited. They are not mutually exclusive.

Risk	*Frequency*
Political/Sovereign	8
Market risk (for Telecoms)	6
Systemic (local infrastructure)	3
Currency Risk	3
Cost Overruns	3
Regulatory Risk such as BEE and the PFMA (Private Financed Management Act)	2
Sponsor	2
Commodity price	1
Skills Shortage	1
Completion	1
Operational risk	1

Table 17: The Most Common Risks Faced in South African Project Finance

7.5.2 PLEASE COMMENT ON THE FOLLOWING STATEMENT: "PROJECT CONTRACTS ARE CONSTRUCTED TO ALLOCATE RISK BUT DESPITE ALL THE TIME AND EFFORT THEY MAY STILL BE INCOMPLETE." DO YOU FIND THIS TO BE THE CASE?

All eleven of the interview respondents that were asked this question agreed, as illustrated in the table below.

Answer	*Frequency*
Yes	11
No	0

Table 18: Incomplete Contracting in Project Finance

The four main comments made when discussing these questions were:

- Contracts are always up for renegotiation.
- The reality is that contracts are negotiated by the lawyers and are generally quite robust if never complete.
- 90% of the time that is spent negotiating is done regarding occurrences that will only happen 1% of the time.
- Over and above the contracts there needs to be a good relationship with the other party.

7.5.3 RISK MANAGEMENT CAN BE LOOKED AT IN THREE STAGES: IDENTIFICATION, ASSESSMENT AND MITIGATION" DO YOU AGREE AND WHY?

This question was only dealt with in four interviews and all agreed that this was the way to view risk management.

7.5.4 HOW DO YOU DEFINE COMPLETION IN YOUR CONTRACTS WITH EPCM AND OTHER SERVICE PROVIDERS?

The following definitions of completion were discussed by the respondents all of which would be more or less appropriate for a particular project and needs to be decided upon on a case by case basis:

- Financial completion, namely when the funding can be drawn down,
- Technical (mechanical and operational) completion,
- Environmental completion, namely when the environmental feasibility has been completed and the project has been approved on this basis,
- COD (Commercial Operation Date),
- LTA (Lender Technical Advisor) opinion of completion,
- Achieving cover ratios and
- The handover for commercial operation.

The following pertinent comments were made in this regard.

- The definition of completion is the most difficult to get right because it triggers the transfer of risk.

- Lawyers generally believe that this is not a legal issue but rather a practical issue.
- The best definition can be reached when the lawyers and technical experts sit with the financiers to agree on a definition as opposed to only one of the parties imposing a definition on the others.

7.6 FINANCING PROJECTS

Project Finance is a financing mechanism. This section aims to explore the various aspects of financing large scale projects. This includes the mechanisms of finance, namely bank debt and bonds and the advantages and disadvantages of each. It also includes the trade-off between financial risk in a project and the returns, syndication strategies, Islamic finance and the sequence of raising debt. Question 23 aims to look at the comparison between Corporate and Project Finance as financing structures but is also relevant to the Structuring and Managing Risk sections.

7.6.1 WHAT DO YOU SEE AS THE MAIN ADVANTAGES AND DISADVANTAGES OF BANK DEBT AND BONDS?

The two tables below illustrate the advantages and disadvantages of bank debt and bonds respectively.

Bank Debt	
Advantages	**Disadvantages**
There is a high level of confidentiality	It has to be held on the SPV's balance sheet and the counter capital is more expensive
The bank is 'in it for the long haul'	It uses up debt capacity and credit lines
It is easier to arrange	Can take longer to arrange
There is less disclosure	More expensive
It is more flexible	
It can be quicker to arrange	

Table 19: The Advantages and Disadvantages of Bank Debt

7.6.2 "AS LEVERAGE INCREASES DEBT SERVICE COVERAGE RATIO DECREASES AND IRR INCREASES. THERE IS [THEREFORE] A TRADE OFF BETWEEN PROJECT FINANCIAL RISK AND SPONSOR RETURNS" DO YOU AGREE AND IF SO HOW DO YOU MANAGE THIS?

This question was only dealt with in seven of the interviews and is illustrated in the table below.

Answer	*Frequency*
Agree	7
Disagree	0

Table 20: The Trade-off Between Project Financial Risk and Sponsor Returns

The responses to how this is managed are as follows:

- It is managed through the structure using, for example, reserve accounts, maintenance reserve accounts and cash-lock-ups.
- It is a balancing act and the project needs to ensure decent returns for all stakeholders.
- There is a tipping point in increasing financial returns where cover ratios will be compromised.
- The difference between 70% and 90% debt is less than between 15% and 20% and so, there is a decreasing rate of return, which can bring disproportionate risk to the project.
- It's hard to determine if the relationship is linear or not; but measures can be put in place to manage it.
- Dividend and distribution lock up are used to manage this.

7.6.3 WHAT ARE THE MOST IMPORTANT CONSIDERATIONS IN A SYNDICATION STRATEGY?

This question was only addressed in interviews with those respondents that were employed by a bank or acted as a financial advisor.

Consideration	*Frequency*
Liquidity in the market	3
Personal relationships	2
Flexibility of the structure	1
Keeping the team small	1
Credibility of the Arranger	1

Table 21: Considerations in a Syndication Strategy

7.6.4 "THERE IS A 'RULE OF THUMB' THAT THE LEAD ARRANGER SHOULD HOLD APPROXIMATELY 10% OF THE LOAN ON ITS BALANCE SHEET" DO YOU FIND THIS TO BE SO IN SOUTH AFRICA?

All seven of the interview respondents that were asked this question disagreed, as illustrated in the table below.

Answer	*Frequency*
Agree	0
Disagree	7

Table 22: The Lead Arranger Should Hold 10% of the Loan on its Balance Sheet

The reasons given for disagreeing were as follows:

- In South Africa, which is a relatively small market, this is not the case with the lead arranger generally holding 25% to 30% of the loan and even up to 100% if it is a Rand based loan.
- Sometimes the bank will just do the arranging without holding a part of the loan because it just wants the fees and is not willing to take on a project that it feels it is too risky.
- South African deals are generally smaller than international ones.

7.6.5 IS THERE A NEED FOR ISLAMIC FINANCE IN SOUTH AFRICA?

The responses to this question can be divided into those relating to South Africa and those relating to Africa as illustrated in the table below.

Answer	Africa	SA
Yes	7	0
No	0	7

Table 23: The Need for Islamic Finance in Africa and South Africa

The major comment that was made regarding Islamic finance is that it is growing very slowly.

7.6.6 ARE SOUTH AFRICANS INVOLVED IN ISLAMIC FINANCE GLOBALLY AND IF SO DO THEY HAVE THE KNOWLEDGE AND EXPERTISE TO DEAL WITH IT?

All five of the interview respondents that were asked this question said that South Africans are involved in Islamic finance and have the necessary expertise to deal with it, as illustrated in the table below.

Answer	Number
Yes	5
No	0

Table 24: South Africans Involved in Islamic Finance

7.6.7 IS PROJECT FINANCE RISKIER THAN CORPORATE FINANCE? WHY OR WHY NOT?

This question is intended to test the perceptions of whether Project Finance is riskier than Corporate Finance and not whether it actually is or not.

Answer	*Frequency*
Yes	5
No	11

Table 25: Is Project Finance Riskier than Corporate Finance?

The main comments made regarding this question were:

- Basel II has different effects on different projects.
- Over all, the effect of Basel II has been to bring down the capital held.
- Project Finance is more risky because the contracts are never done and the South African Reserve Bank (SARB) perceives it this way.
- There is, currently, a flight to good quality assets as a result of the prevailing global macro-economic conditions.
- Few projects actually fail and none have in South Africa.

7.6.8 WHAT SEQUENCE DO YOU USE WHEN RAISING DEBT?

As the last question, this was only dealt with in a few interviews and it emerged that almost no projects in the experience of those being interviewed needed multiple rounds of fund raising. As such the question was not entirely relevant.

7.7 CONCLUSION ON THE INTERVIEW RESULTS

This chapter has presented the results of the interviews for each question that was asked. The following chapter will analyse these results, demonstrate their meaning in the context of the theory presented in Chapter 6 and show their relevance to the South African Project Finance Industry.

8. CHAPTER 8: RESULTS DISCUSSION

8.1 INTRODUCTION TO THE RESULTS DISCUSSION

Having presented the results of the interviews in the previous chapter, this chapter will discuss these results in light of the theory presented in Chapter 6. The discussion will be divided into the five areas of Project Finance as in the previous chapters. In each of the sections, where the research produced relevant results, the questions posed in Chapter 3 will be answered.

It should be noted that while the analysis in this chapter has been done in accordance with the principles and philosophy set out in Chapter 4, it has still been done by the individual researcher and as such is one individual's interpretation of the results. Therefore the interpretation of the results of the interviews and how they interact with the relevant theory should be further discussed and tested in subsequent research.

The broad nature of the research also means that not every aspect of the results will be discussed. Only those aspects that are relevant in answering the research questions will be dealt with in this chapter. The material cited in this chapter, unless otherwise shown, stems from the interview respondents. These can, therefore, not be referenced in order to maintain confidentiality. Where references have been made to the theory, the reader will notice that it is most often to the theory cited in Chapter 6 and not as may be expected in Chapter

two in the literature review. The reason for this is that, as this is a piece of exploratory research, the literature that may have ordinarily been explored upfront was analysed as part of the research in Phase 1.

8.2 DEFINING PROJECT FINANCE

8.2.1 THE CURRENT STATE OF THE DEFINITION OF PROJECT FINANCE IN SOUTH AFRICA AND LESSONS FOR SOUTH AFRICA FROM PROJECT FINANCE THEORY

It was evident from the interviews that the concept of Project Finance is easily explained but that there appears to be a lack of a clear definition of Project Finance in South Africa. Furthermore there is no agreed upon definition within the various institutions involved in Project Finance. This is probably because there has never been a practical need for a definition. This is in line with the literature that suggests that this is the case on a global level (Esty and Sesia, 2003a). As this industry grows, a clear definition may need to be developed. Project Finance and corporate finance have different capital requirements and lending needs to be categorised as such in order to determine the appropriate capital risk weightings in line with the Basel II accord (Esty and Sesia, 2003d).

One of the main points that emerged from the interviews, regarding the definition of Project Finance, was that Project Finance in South Africa in its purest form is rare, mainly due to government involvement. As such the line dividing Project Finance and other financing structures is blurred more than in developed countries where full non-recourse debt can take place. As such, at

least within institutions, a clear definition will be needed in order to assess the capital risk weightings of these projects, especially in an illiquid market where banks need to preserve scarce capital.

8.3 STRUCTURING PROJECTS

8.3.1 THE CURRENT STATE OF STRUCTURING PROJECT FINANCE IN SOUTH AFRICA

8.3.1.1 MOTIVATIONS FOR USING PROJECT FINANCE

The results of the interviews illustrate that the main motivation for using Project Finance in South Africa is its defining characteristic: limited or non-recourse debt that allows firms to carry out projects that their balance sheets cannot support and to keep debt capacity open. They also identified the long implementation times and higher upfront costs as the major disadvantages of Project Finance.

In both of these cases, however, the interview respondents only mentioned a few of the advantages and disadvantages of Project Finance in relation to the number of items listed in the theory discussed in 6.3.1 and 6.3.2 above (Esty, 2001c; 2002b; 2003b; 2003c; 2003k; 2003f; Esty and Ferman, 2003b; Esty and Kane 2003e; Esty and Sesia, 2003c). No mention of any theory was made in any of the interviews. All answers seemed to stem from the respondents own experience. This is consistent with the fact that there is no tertiary education in

South Africa that focuses on Project Finance other than ad-hoc courses run by Euromoney Plc. It emerged from the interviews that no university qualifications, including the Masters of Business Administration and Chartered Accountant courses focus on Project Finance.

8.3.1.2 THE INVOLVEMENT OF MULTILATERAL DEVELOPMENT AGENCIES

As would be expected in a developing market such as South Africa there is a high level of involvement of Multilateral Development Agencies (MDA's), both international and locally based. The main reason for involving them, identified by the interview respondents, was for additional funding and only in some case for political risk insurance. The theory identifies these as the two main reasons for involving MDA's, discussed in 6.3.5 above (Esty, 2003c; 2003k; 2006b). This probably reflects the South African market where an MDA would be brought in primarily for funding and not for political insurance given the relatively high level of political stability in South Africa in comparison to most other African countries.

8.3.1.3 THE DETERMINANTS OF CAPITAL STRUCTURE

The topic of the determinants of capital structure solidified the impression that there is a chasm that exists between the theory and the practice of Project Finance. The determinants discussed in the interviews, listed in Table 10, are variations of the levels of risk inherent in a project and the funds available to the sponsors. The theory, however, looks in depth at many of the determinants of

Capital structure, including various theories such as Information Asymmetry Theory and Static Trade-off Theory, as discussed in 6.3.4 above (Esty, 2002b).

There seems to be a lack of depth in understanding the potential benefits of Project Finance. The motivations for using and the benefits of Project Finance identified in the interviews refer chiefly to the main characteristics and not to the many other aspects identified in the theory. There may be value to clients in demonstrating the other benefits of Project Finance both in terms of generating sales and in the client's appreciation of the service being provided.

8.4 VALUING PROJECTS

8.4.1 THE CURRENT STATE OF PROJECT FINANCE IN SOUTH AFRICA

The overwhelming majority of interview respondents preferred to use relatively simple valuation tools such as DCF and saw little need for using more complex tools. The literature suggests, in contrast to this practice, that using more complex methods can be very beneficial (Esty, 2002b, 2003d, 2003j; Tufano and Moel 1997; 1998). In particular the literature refers to using the Economic Rate of Return (ERR) as a valuation tool in developing and emerging markets (Esty and Lysy, 2003a; 2003b; Esty, Lysy and Ferman, 2003).

In further discussion with these respondents it was revealed that the lack of competition in the South African market was a major cause of not using more complex valuation methods. The five leading banks offer Project Finance

services and do not need to differentiate on elements such as valuation tools. The respondents also highlighted the fact that they tended to be more conservative in their valuations. The preference was to try to account for all the potential risks in the valuation and not try to get as accurate a valuation as possible. The respondents did however see some value in using multiple discount rates within a DCF model in certain circumstances.

Another reason why more complex tools are not needed is due to the limited scope of projects that occur in the local market. So, for example, none of the respondents had reported being involved in a project that required building optionality into a valuation. It seems, however, that when dealing with internal funds at the various banks more complex tools are used to calculate capital risk weightings.

As mentioned above in 6.4.1 there a number of disadvantages to a valuation when using only a DCF method. There is potential for the theory of Project Finance to inform the practice of it in South Africa by introducing new, more accurate valuation techniques, even if they are more complex. As the South African Project Finance market matures, these techniques will likely become more common, as they are in more advanced markets such as in the USA and Europe.

One of the methods that have been used in South Africa by organisations such as the IFC is the Economic Rate of Return (ERR). This is explored in 6.4.5 above. In a developing market such as South Africa there is further opportunity

to use these methods where the motives for projects are not purely financial. This, therefore, is another area where the theory can inform practice.

8.5 MANAGING PROJECT RISK

8.5.1 THE CURRENT STATE OF MANAGING PROJECT FINANCE RISK IN SOUTH AFRICA

Risk management appears, from the interviews, to be a well developed field in South Africa. In all the responses there was almost complete agreement with what the theory stated. The Mozal case study, discussed in 5.2.3.5 above, attests to the skills that exist in the South African market in this area (Esty, and Lysy, 2003a).

One of the respondents, who was involved in the Mozal project, referred to The Sixteen Project Risks published by International Advisory and Finance (IAF), a global advisory firm that specialises in Project Finance. These sixteen risks were viewed by the respondent, not merely as a way of mitigating risk on a project but rather, as the defining characteristics of Project Finance and what the Project Finance structure aims to accomplish. The Sixteen Risks are listed below but further information can be found on the IAF website (IAF, 2008). The Sixteen Risks are:

1. Operating Risk: Technical,
2. Operating Risk: Cost,
3. Operating Risk: Management,

4. Sponsor/Participant,
5. Engineering,
6. Completion,
7. Supply/Traffic/Reserve,
8. Market,
9. Infrastructure,
10. Environmental,
11. Political,
12. Force Majeure,
13. Foreign Exchange,
14. Syndication,
15. Interest/Funding and
16. Legal

Esty and Sesia (2003b) also list categories for classifying risk. This is not merely an academic debate but rather different ways of ensuring that the various risks inherent in large scale projects are identified and mitigated.

There were also a number of issues that were raised in the interviews with specific reference to risk management in Project Finance. Firstly the issue of whether Project Finance is riskier than Corporate Finance. While this was dealt with in the Financing Projects section in the interviews, it has been included here because of its relevance to this section. This was a lengthy discussion point in the interviews especially with the respondents who are employees of the banks. This issue has direct implications for the amount of capital that the

banks need to hold as discussed in 6.5.3 above, concerning the Basel II accord (Esty and Sesia, 2003a; 2003d).

This is certainly a point for further research, as will be discussed below, but it emerged from the interviews that the question needs refining. The initial understanding of this question by the respondents was to test whether projects that use Project Finance have a higher risk of failing than corporate finance deals. The initial response by many of the respondents was that Project Finance is riskier. This was also the initial view of the Basel II committee (Esty and Sesia, 2003a; 2003d).

However the question was narrowed down to mean, does a Project Finance project have a higher probability of default (PD) and if it does what is the likely loss given default (LGD) when compared to corporate finance deals? All agreed that in this case Project Finance was less risky due to the extensive due diligences that are carried out. This is directly in line with the eventual findings of the Basel II committee (Esty and Sesia, 2003a).

8.6 FINANCING PROJECTS

8.6.1 THE CURRENT STATE OF PROJECT FINANCE IN SOUTH AFRICA

While the skills of the South African Project Finance market are advanced and respected around the world, according to one interview respondent, it is a relatively small and therefore in some ways under-developed market. One of

the main features of this is the way projects are financed. There has never been a Project Bond issued in South Africa although some attempts have been made. So while the respondents were aware of the relative disadvantages of bank debt it is by far the preferred form of finance. This is in contrast to the international norm of raising project bonds (Esty, 2001c). The alternative is to use corporate bonds or government funding which then means that infrastructure projects often don't use true Project Finance because there is full recourse to the assets of the sponsor.

8.6.1.1 THE LEAD ARRANGER IN SOUTH AFRICAN PROJECT FINANCE

Where bank debt is used it is often syndicated. However, as illustrated in Table 22 above, the lead arranger will often hold 25% to 30% of the loan and not 10% which is the international norm (Esty, 2003b; 2003g). This can even be 100% in some cases. The reasons for this are the relatively small projects that are carried out in South Africa when compared to many international Projects.

Most of the respondents agreed that the lead arranger should hold at least some of the debt in order to demonstrate its faith in the project. In other words when a bank approaches other funders to finance a project the first question that will be asked is wether it is taking any itself. As one interview respondent said, "If you don't, then why should I?"

An opinion that was raised in opposition to this was that in a number of cases in Africa the arranger stated upfront that it would not hold any part of the loan

because of the risk profile of the project but it was still willing to bring arranging and advisory skills to the project.

8.6.1.2 THE SEQUENCE OF RAISING DEBT IN SOUTH AFRICA

Another point that demonstrates the small nature of the South African market is that very few of the respondents had been involved in projects where multiple rounds of financing were required, in contrast with, for example, the Iridium case study where multiple rounds of financing were required (Esty, 2002b). In the experience of the South African Project Finance industry experts, banks were often not willing to get involved until all the feasibility studies had been completed. Financing for pre-project development is apparently very difficult to find in South Africa and where it has occurred this has often come from government sources, private funding or international investors. There will, therefore, most often be one round of financing from the banks who would almost certainly not lend to anyone who did not already have equity in the project.

8.6.1.3 ISLAMIC FINANCE

As is evident from the answers reported in 6.13.5 and 6 there is very limited scope for Islamic Finance in South Africa but large scope in Africa and particularly North Africa. This is in line with the literature that suggests that in certain regions Islamic Finance is growing, albeit slowly (Esty, 2003m; Esty, *et*

al., 2000). South Africans do however have the necessary skills to arrange Islamic Financing and have done so in the past.

8.7 SUGGESTIONS FOR FURTHER RESEARCH INTO PROJECT FINANCE

As a piece of exploratory research one of the main questions asked here is, what further research needs to be done? This has therefore been included here in the results analysis and not later in the conclusion. It should also be noted that one of the major challenges of research in this area is the availability of data in the South African market. In the researcher's experience institutions involved in Project Finance were not willing to divulge any specific information regarding projects they had been involved in. The small nature of the market also means that information cannot be disguised because it is well known who is involved in each of the projects. Nevertheless the research did produce a set of recommendations for further research that could help strengthen the theoretical base of Project Finance both in South Africa and internationally.

8.7.1 VOLATILITY IN PROJECT FINANCE INVESTMENT

Further research could explore the relationship between levels of liquidity in capital markets and the extent of the use of Project Finance. There appears to be a contradictory relationship that exists between Project Finance and market liquidity. On the one hand the use of Project Finance seems increase in times of liquidity due to the large amount of capital needed for these projects and its availability. On the other hand, in times of Illiquidity, investors look towards good

quality assets which would also suggest an increase in the use of Project Finance. This research could be phrased in a different way as follows: Is Project Finance investment subject to as much volatility in levels of investment as other types of investments?

8.7.2 BLACK ECONOMIC EMPOWERMENT AND PROJECT FINANCE IN SOUTH AFRICA

The theory of Project Finance often refers to market imperfections. One of the greatest market imperfections in South Africa is Black Economic Empowerment (BEE) and while research could be carried out on the general effect of BEE on the South African economy it may be worthwhile to explore the specific effect of BEE on Project Finance in South Africa. This is because of the large nature of the projects and the levels of capital that need to be allocated to BEE shareholders.

8.7.3 IS PROJECT FINANCE RISKIER THAN CORPORATE FINANCE?

As discussed in 8.5.1 above this was a point of discussion in all the interviews. It appears to be a point of interest for many professionals working in Project Finance because it has practical ramifications for which projects are allocated to the Project Finance division and the capital that banks need to retain for the projects they finance. One of the interview respondents commented that the view of the South African Reserve Bank is that Project Finance is riskier than

corporate finance. Research in this area would, therefore, be valuable not only for academic purposes but practically as well.

There is a challenge that would need to be overcome in doing this research in terms of access to information. The data required for the research is highly sensitive and in conducting this research no bank was willing to divulge such information. As such, this type of research would have to be conducted either as an industry initiative by independent researchers or for a particular institution that would sponsor such research.

8.7.4 A SOUTH AFRICAN PROJECT FINANCE CASE STUDY

As shown in this research there are a number of international case studies on Project Finance, including a number that focus on Africa and Southern Africa. However additional research is required on projects in developing markets in order to demonstrate how the risks, which are often substantial, can be managed and mitigated. One of the ways of demonstrating this is through a case study. The challenge to this research would be access to detailed financials of a project.

Another line of thinking would be to write up a case study on a government infrastructure project that has used a small amount of Project Finance but that has used Project Finance methodology. This may be a model which could be used in other developing markets where there is government involvement as well as Project Finance.

8.7.5 INDEPENDENT ADVISORS IN PROJECT FINANCE

One of the questions that were raised in two of the interviews was: does the presence of an independent financial advisor affect the capital structure of a project? In other words, without the presence of a financial advisor will the banks structure the deal to their advantage and not necessarily to the advantage of the sponsor? One of the respondents claimed to always recommend an independent advisor in order to ensure fairness in the project.

8.8 CONCLUSION ON THE RESULTS ANALYSIS

This chapter has analysed the results of the interviews that were carried out, in light of the theory presented in Chapter 6 above. The aim of the chapter was to answer the research questions by showing the current state of Project Finance in South Africa and the lessons and principles that can be learnt from international Project Finance.

The interview results cover a wide variety of topics within Project Finance. However the central point that emerges is the dichotomy between the skills that exist in the Project Finance sector in South Africa and the small nature of the South African market. While the practical skills that exist in the market are extensive the theoretical basis that exists is minimal.

This supports the proposition that Professor Esty puts forward, that the theory of Project Finance, globally, lags far behind the practice of it (2006a). For this reason the final recommendation of this exploratory research is for further research to be carried out.

9. CHAPTER 9: CONCLUSION

9.1 INTRODUCTION

This chapter addresses the main problem of Project Finance as outlined in Chapter 1 as well as how the research objectives were met through conducting this research. The modern form of Project finance started in the 1980's due to economic and population growth, a debt crisis and other factors which created a need to involve the private sector in building infrastructure. The magnitude of these projects relative to the balance sheets of these private companies meant that conventional finance could not be used without posing a serious risk to these organisations. Project Finance therefore emerged as a way of financing projects using high leverage, extensive contracting and no or limited recourse to the balance sheets of the companies involved (IPFA, 2008).

9.2 THE CENTRAL RESEARCH PROBLEM

The practice of Project Finance has grown tremendously since then but the progress of academic research into Project Finance lags far behind its practical implementation. With the increased investment in infrastructure, both globally and in South Africa, Project Finance is becoming evermore important (Esty, 2006a).

Given the scale of the spend that will take place both globally and in South Africa and the strain which current State Owned Enterprises' balance sheets are experiencing, much of the financing will need to be done on an off balance sheet and possibly, project basis. Even if pure Project Finance is not used, its methodologies will be critical in ensuring that these projects are financially viable.

Investment in Project Finance has seen tremendous growth and by 2006 had reached a historical high of US$328 billion, including both debt and equity. This was a 23% increase over 2005 and followed on from a massive downturn in 2001, where global investment fell by 40% year on year mainly due to the global recession that was occurring at the time (Esty, 2006a).

During the time that this research has been carried out a credit crisis has emerged that will probably have an adverse effect on infrastructure investment, as it did in 2001. Even so, as discussed in Chapter One, the demands for basic infrastructure that population growth and societal development is placing on the world will require the development of this infrastructure. Furthermore, in the words of one of the interview respondents, "in tough times, investments flow to quality assets." Project Finance, through its extensive due diligences, contracting and risk mitigation ensures that investment are only made in quality assets and therefore promises to be an area of further interest in the coming years.

9.3 THE RESEARCH OBJECTIVES

Given the central research problem, that there is a lack of research that has been conducted in the field of Project Finance, the objectives of this research were threefold. The first objective was to develop a theoretical foundation of Project Finance that would be pertinent to South Africa in its infrastructure build programme. This was done by looking to case studies on international Project Finance projects and extracting the theories, principles and lessons from each of them. Chapter Six outlined this theory base.

The second objective was to assess the current practise of South African Project Finance against the theory taken from the international case studies. This was done through developing a questionnaire based on this theory and conducting interviews with sixteen South African industry experts. Chapters Seven and Eight set out the results of these interviews and describe the practice of Project Finance in its current form in South Africa.

The third objective was for this research to act as a catalyst for further research on Project Finance in South Africa which can focus both on Project Finance in general and on specific areas in Project Finance. To this end recommendations for further research have been made at the end of Chapter Eight.

9.4 RECOMMENDATIONS TO STAKEHOLDERS

The results of this research should prove useful to both South African and international industry stakeholders as they have created a theoretical foundation for the work that they do. This suggestion is in line with all the interview respondents, who expressed interest in the results.

The first recommendation to industry stakeholders would be to encourage and become involved in further research into Project Finance. This could be done by involving tertiary institutions, including business schools and universities, by promoting the inclusion of Project Finance in the theory taught at these institutions. The result of this would be to encourage more professionals with higher skills to become involved in Project Finance.

The second recommendation would be for institutions to start sharing the information they have in a way that does not compromise their competitive positions. This could be done by creating an industry body that would have access to the relevant information but that is not part of or sponsored by any particular institution. This would be something that would be difficult to set up because, as was expressed in a number of the interviews, the organisations involved in Project Finance are very protective over the detailed information they have on their projects. Nevertheless there would be tremendous benefits in sharing this information and conducting research. For example a study into the true risk profiles of the projects carried out by these institutions could lead to a decrease in the capital risk weightings that apply to them.

Another way of achieving this would be to leverage of the already existing databases that Euromoney Plc has and creating a specific database around South Africa projects by providing information from South African institutions to Euromoney Plc.

In summary, the main point is to encourage further research into Project Finance in South Africa. In line with the words of Professor Benjamin Esty, positioned as we are at the beginning of the learning curve, especially in South Africa, even small improvements in theory and practice can yield large financial, social, and academic returns (2004).

9.5 CHAPTER CONCLUSION

This final chapter of the research has addressed the main research problem of Project Finance, reviewed the objectives of the research and demonstrated how these objectives have been met. Recommendations have also been made to industry stakeholders for further research in the Project Finance industry and this chapter serves as the formal conclusion to the research project presented.

10. REFERENCE LIST

Balcombe, K.G. and Smith, L.E.D. (1999) Refining the Use of Monte Carlo Techniques for Risk Analysis in Project Planning, *The Journal of Development Studies*, 26 (2), 113-135.

Bavaria, S.M. (2002) *Syndicated Loans--A Rated Market, at Last!,* Standard & Poor's Corporation, 2/12/02.

Beenhakker, H. L. (1997) *Risk Management in Project Finance and Implementation*, Quorum Books (Westport, CT).

Bowe, M., and Lun Lee, D. (2004) Project Evaluation in the Presence of Multiple Embedded Real Options: Evidence from the Taiwan High-Speed Rail Project, *Journal of Asian Economics*, 15 (1), 71-98.

Chipp, K. (2008), Research Methodology Course, MBA Modular, Gordon Institute of Business Science, Illovo, Johannesburg, 19-22 January 2008.

Clark, D. (2006) *Voluntary Turnover of Senior Women in Large South African Organisations, A Masters of Business Administration Business Proposal*, The Gordon Institute of Business Science, Johannesburg.

Creamer, T. (2007) M&R wins Bravo, Medupi boiler construction projects, *Engineering News* 11 December 2007 - 18:52, Available from: http://www.engineeringnews.co.za/article.php?a_id=125485 (accessed 12/05/2008).

Creamer, T. (2008a) Recapitalisation of Eskom 'inevitable' – Erwin, *Engineering News* 8 February 2008 available from: http://www.engineeringnews.co.za/article.php?a_id=125642 (accessed 28/05/2008).

Creamer, T. (2008b) 'Use the Republic's balance sheet to fund power expansion,' *Engineering News* 16 May 2008, available from http://www.engineeringnews.co.za/article.php?a_id=132645 (accessed 28/05/2008).

Dailami, M. and Hauswald R. (2001) *Credit Spread Determinants and Interlocking Contracts: a Clinical Study of the Ras Gas Project*, University of Maryland working paper, November 2001.

Dailami, M. and Hauswald, R. (2003) *The Emerging Project Bond Market: Covenant Provisions and Credit Spreads*, World Bank Policy Research Working Paper #3095, July.

Delmon, J. (2005) *Project Finance: BOT Projects and Risk, Kluwer Law International* (The Hague, Netherlands).

Devapriya, K.A.K. and Alfen, H.W. (2003) *Role of Institutional Arrangements in Financing Project Companies in Asia, working paper*, Bauhaus- Universität Weimar, October 2.

Duncan, F. (2008) *Budget in a Nutshell, Moneyweb 20 February 2008, available from:* http://www.moneyweb.co.za/mw/view/mw/en/page32837?oid=194717&sn=Detail, (accessed 06/07/2008).

Eskom (2008) *Eskom Annual Report 2008* available from:

http://financialresults.co.za/eskom_ar2008/ (accessed 10/11/2008).

Esty, B. C. (1999) Improved Techniques for Valuing Large Scale Projects. *The Journal of Project Finance*, (8320) 9-25.

Esty, B. C. (2001a) *Airbus A3XX: Developing the World's Largest Commercial Jet (B)*, Harvard Business School, Boston, August 23 2001.

Esty, B. C. (2001b) *Teaching Note, Airbus A3XX (A and B): Developing the World's Largest Commercial Jet (A)* Harvard Business School, Boston, August 20 2001.

Esty, B. C. (2001c) *Teaching Note, Petrolera Zuata, Petrozuata C.A.*, Harvard Business School, Boston, June 1, 2001.

Esty, B. C. (2002a) *Petrolera Zuata, Petrozuata C.A.*, Harvard Business School, Boston, March 07, 2002.

Esty, B. C. (2002b) *Teaching Note, Iridium LLC,* Harvard Business School, Boston, March 19, 2002.

Esty, B. C. (2003a) *Airbus A3XX: Developing the World's Largest Commercial Jet (A)* Harvard Business School, Boston, April 30 2003.

Esty, B. C. (2003b) *Chase's Strategy for Syndicating the Hong Kong Disneyland Loan (A)* Harvard Business School, Boston, April 14, 2003.

Esty, B. C. (2003c) *Financing the Mozal Project,* Harvard Business School, Boston, April 15, 2003.

Esty, B. C. (2003d) *Iridium LLC,* Harvard Business School, Boston, April 11, 2003.

Esty, B. C. (2003e) *Poland's A2 Motorway*, Harvard Business School, Boston, April 15 2003.

Esty, B. C. (2003f) *Teaching Note, BP Amoco (A) and (B): Financing Development of the Caspian Oil Fields*, Harvard Business School, Boston, January 29, 2003.

Esty, B. C. (2003g) *Teaching Note, Chase's Strategy for Syndicating the Hong Kong Disneyland Loan (A)* Harvard Business School, Boston, June 3, 2003.

Esty, B. C. (2003h) *Teaching Note, Financing the Mozal Project,* Harvard Business School, Boston, March 20, 2003.

Esty, B. C. (2003i) *Teaching Note, Poland's A2 Motorway*, Harvard Business School, Boston, March 6 2002.

Esty, B. C. (2003j) *Teaching Note, Texas High-Speed Rail Corporation*, Harvard Business School, Boston, July 21, 2003.

Esty B. C. (2003k) *Teaching Note, The Chad-Cameroon Petroleum Development and Pipeline Project (A) Harvard Business School, Boston, January 16, 2003.*

Esty, B. C. (2003l) *The Economic Motivations for using Project Finance,* Harvard Business School, Boston, April 11, 2003.

Esty, B. C. (2003m) *The International Investor: Islamic Finance and the Equate Project,* Harvard Business School, Boston, April 14, 2003.

Esty, B. C. (2004) Why Study Large Projects? An Introduction to Research on Project Finance, *European Financial Management*. 10, (2), 213–224.

Esty, B. C. (2006a) *Modern Project Finance: A Casebook*, John Wiley & Sons, Inc., New York.

Esty, B. C. (2006b) *The Chad-Cameroon Petroleum Development and Pipeline Project (A)* Harvard Business School, Boston, March 17, 2006.

Esty, B. C. and Ferman C. (2003a) *Australia-Japan Cable: Structuring the Project Company* Harvard Business School, Boston, January *22*, 2003.

Esty, B. C. and Ferman C. (2003b) Teaching Note, *Australia-Japan Cable: Structuring the Project Company* Harvard Business School, Boston, January *27*, 2003.

Esty, B. C. and Ferman C. (2003c) *Financing PPL Corporation's Growth Strategy, Harvard Business School,* Boston, April 3, 2003.

Esty, B. C. and Kane, M. (2002) *Restructuring Bulong's Project Debt*, Harvard Business School, Boston, March 31, 2003.

Esty, B. C. and Kane, M. (2003a) Teaching Note, *Restructuring Bulong's Project Debt*, Harvard Business School, Boston, June 6, 2003.

Esty, B. C. and Kane M. (2003b) *BP Amoco (A): Policy Statement on the use of Project Finance*, Harvard Business School, Boston, January 30, 2003.

Esty, B. C. and Kane M. (2003c) *BP Amoco (B): Financing Development of the Caspian Oil Fields*, Harvard Business School, Boston, January 30, 2003.

Esty, B. C. and Kane M. (2003d) *Calpine Corporation: The Evolution from Project to Corporate,* Finance Harvard Business School, Boston, January 21, 2003.

Esty, B. C. and Kane M. (2003e) *Teaching Note, Calpine Corporation: The Evolution from Project to Corporate,* Finance Harvard Business School, Boston, January 24, 2003.

Esty, B. C. and Lysy F. J. (2003a) *Nghe An Tate and Lyle Sugar Company (Vietnam)*, Harvard Business School, Boston, May 27, 2003.

Esty, B. C. and Lysy F. J. (2003b) *Teaching Note*, *Nghe An Tate and Lyle Sugar Company (Vietnam)*, Harvard Business School, Boston, May 27, 2003.

Esty, B. C., Lysy F. J. and Ferman C. (2003) *An Economic Framework for Assessing Development Impact,* Harvard Business School, Boston, February 7 2003.

Esty, B. C. and Millet, M. M. (2002) Teaching Note, *The International Investor: Islamic Finance and the Equate Project,* Harvard Business School, Boston, March 18, 2003.

Esty, B. C., Qureshi, F. A. and Millett, M. M. (2000) Introduction to Islamic Finance, Harvard Business School, Boston, February 16, 2000.

Esty, B. C. and Sesia A. (2003a) *Basel II: Assessing the Default and Loss Characteristics of Project Finance Loans*, Harvard Business School, Boston, February 14, 2003.

Esty, B. C. and Sesia A. (2003b) *Contractual Innovation in the U.K. energy markets: Enron Europe, the Eastern Group and the Sutton Bridge Project*, Harvard Business School, Boston, June 9, 2003.

Esty, B. C. and Sesia, A. (2003c) *Mobile Energy Services Company*, Harvard Business School, Boston, May 12, 2003.

Esty, B. C. and Sesia A. (2003d) *Teaching Note, Basel II: Assessing the Default and Loss Characteristics of Project Finance Loans*, Harvard Business School, Boston, June 16, 2003.

Esty, B. C. and Sesia, A (2003e) *Teaching Note: Financing PPL Corporation's Growth Strategy,* Harvard Business School, Boston, July 17, 2003.

Esty, B. C. and Sesia, A. (2003f) *Teaching Note, Mobile Energy Services Company*, Harvard Business School, Boston, February 19, 2003.

Esty, B. C. and Sesia, A. (2006) *An Overview of Project Finance and Infrastructure Finance 2006 Update*, Harvard Business School, Boston.

Esty, B. C. and Tufano P. (2003) *Contractual Innovation in the U.K. energy markets: Enron Europe, the Eastern Group and the Sutton Bridge Project*, Harvard Business School, Boston, April 4 2003.

Euromoney (2008), Project Finance*: Practical Case Studies, Vol 1 - Power and Water*, edited by Henry A Davis (published 2003) available from http://www.euromoneyplc.com/product.asp?PositionID=cart&ProductID=5374, (accessed 13/05/2008).

Euromoney (2008), *Project Finance: Practical Case Studies, Vol 2* - Resources and Infrastructure, edited by Henry A Davis (published 2003) available from http://www.euromoneyplc.com/product.asp?PositionID=cart&ProductID=5374 (accessed 13/05/2008).

Fishbein, G. and Babar, S. (1996) *Private Financing of Toll Roads*, RMC Discussion Paper Series 117, World Bank, September.

Fitzgerald, P.F. and Machlin, B.N. (2001) *Project Financing: Building Infrastructure Projects in Developing Markets*, Practising Law Institute (New York, NY).

Forrester, J. P. (1995) The Role of Commercial Banks in Project Finance, *Journal of Project Finance*, Summer, pp. 53-58.

Frame, J. D. (2003) *Project Finance: Tools and Techniques*, University of Management and Technology (UMT) Press (Arlington, VA).

GIBS (Gordon Institute of Business Science Website) (2008) available from: http://www.gibs.co.za/home.asp?pid=35#electiveCourses (accessed 10/09/2008).

Gillham, B. (2000) *The Research Interview,* Continuum, London.

Gillham, B. (2005) *Research Interviewing: The Range of Techniques*. Maidenhead, Open University Press.

Gompers, P.A. (1995) Optimal investment, monitoring and the staging of venture capital, *The Journal of Finance*, 50, 1461-1489.

GSB (Graduate School of Business Website) (2008) available from: http://www.gsb.uct.ac.za/gsbwebb/default.asp?intpagenr=12 (accessed 10/07/2008).

HBS (Harvard Business School Website), (2008); available from: http://www.people.hbs.edu/besty/projfinportal/MPFcover.htm (accessed 21/05/2008).

Harvin, D., Hermans, M., McDermott, M. and Monnier L. (2006) *Tailored Debt Structures: A Better Fit for Uncertain Cash Flow*s, Fitch Ratings, Project Finance Special Report, 3/22/06.

IAF (International Advisory and Finance), (2008) The Sixteen Risks, available from http://www.iaf.au.com/16risks.htm#RISK%20CATEGORIES (accessed 05/11/2008).

Imai, J. and Nakajima, M. (2001) *A Real Option Analysis of an Oil Refinery Project*, Financial Practice and Education, Fall/Winter, pp. 78-91.

International Energy Agency, (2003) *World Energy Outlook*, [online]. Houston. Available from http://www.iea.org/textbase/speech/2003/mandil/houston.pdf, (accessed 25/02/2008).

IFC (International Finance Corporation) available from www.ifc.org, (accessed 29/05/08).

Infrastructure Network (2006), *Infrastructure: Lessons from The Last two Decades of World Bank Engagement,* Volume 1, Discussion paper, January 30, 2006, World Bank.

International Finance Corporation, (1999), *Mitigating Major Project Risks*, Chapter 4 in Project Finance in Developing Countries, Lessons from Experience #7 (Washington, DC).

Infoplease (2008) available from: http://www.infoplease.com/ipa/A0107403.html (accessed 24/03/2008).

IPFA (International Project Finance Association) (2008), *Introduction to Project Finance* available from: http://www.ipfa.org/about_pf.shtml (accessed 10/11/2008).

Journal of Financial Economics, (2008) Available from: http://jfe.rochester.edu/toc.htm (accessed 06/05/2008).

The Journal of Finance, (2008), The American Finance Association available from http://www.afajof.org/journal/browse2.asp?ref=0022082&vid=62&iid=5&oc=&s= (accessed 06/05/2008).

Journal of Financial and Quantitative Analysis, (2008) available from http://www.jfqa.org/ under *Abstracts of Recently Published JFQA Articles* (accessed 01/06/2008).

Karmokolias, Y. (1996) *Cost Benefit Analysis of Private Sector Environmental Investments: A Case Study of the Kunda Cement Factory*, International Finance Corporation (IFC) Discussion Paper #30, Washington, DC, June.

Logan, T. (2003) Optimal Debt Capacity for BOT projects in Emerging Economies. *The journal of Structured and Project Finance* Volume: Fall 2003 p71-79.

Luehrman, T. A. and Regan A. D. (2003) Texas *High-Speed Rail Corporation*, Harvard Business School, Boston, July 21, 2003.

Manuel, T. A. (2008) *2008 Budget Speech* [online] Cape Town, South Africa. Available from: http://www.treasury.gov.za/documents/national%20budget/2008/speech/speech.pdf (accessed 25/02/2008).

Merriam, S.B. (1998) *Qualitative Research and Case Study Applications in Educatio*n, San Francisco: Josey-Bass Inc., Publishers.

Miller, R., and Lessard, D. (2000) Understanding and Managing Risks in Large Engineering Projects, *International Journal of Project Management*, 19. (8) 437-443.

Moustakas, C. (1994) *Phenomenological Research Methods*, Sage Publications, California.

Myers S.C. (1984) The Capital Structure Puzzle, *Journal of Finance* 39, 575-592.

Myers, S.C. and Majluf, N.S. (1984) Corporate Financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221.

Ndaba, D. (2008) State seeks transport legacy while making football history, *Engineering News;* Available from http://www.engineeringnews.co.za/article.php?a_id=133169, (accessed 13/05/2008).

Penrose, J. F. (1996) Special-Purpose Entities in Project Finance Transactions, *Journal of Project Finance*, Fall, PP. 58-66.

PFI (2008a) Project Finance International, League Tables, Issue 376, pp 46 – 72, available from http://www.pfie.com/PDFs/PFI/FinancialLT/PFILeagueTables2007.pdf (accessed 09/07/2008).

PFI (2008b) Project Finance International, League Tables, Issue 389, pp 44 – 60, available from http://www.pfie.com/PDFs/PFI/FinancialLT/PFI%20Financial%20League%20Tables%20H1%202008.pdf (accessed 09/07/2008).

Phillips, P. D., Groth, J.C. and Richards R.M. (1979) Financing the Alaskan Project: The Experience at Sohio*, Financial Management*, pp. 7-16.

Review of Financial Studies, (2008) available from http://rfs.oxfordjournals.org/content/vol16/issue4 to vol20/issue3 (accessed 06/05/2008).

Sahlman, W.A. (1990) The structure and governance of venture capital organisations, *Journal of Financial Economics*, 27, 473-521.

SANRAL (2008) South African National Roads Agency Ltd. website, available from: http://www.nra.co.za/live/content.php?Category_ID=29 (accessed 08/07/2008).

Scheinkestel, N. L. (1997) The Debt-Equity Conflict: Where Does Project Financing Fit? *Journal of Banking and Finance Law and Practice*, Vol. 8, pp. 103-124.

Tinsley, R. (1991) *Structuring Risk in Project Finance: The Case of the Kutubu Petroleum Development, Applied Finance for Natural Resources, United Nations, Proceedings of the Interregional Seminar*, UN Dept. of Technical Cooperation and Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand, 9-14 December 1991, 4 (3), 163-180.

Transnet (2008) *Transnet Annual Financial Results Presentation*, 31 March 2008, available from: http://www.transnet.co.za/PRinDetail.aspx?PageHeader=Transnet+2008+Results+%e2%80%93+Powerpoint+presentation (accessed 07/07/2008).

Tufano, P. and Moel A. (1997) *Bidding for Antamina*, Harvard Business School, Boston, September 15, 1997.

Tufano, P. and Moel A. (1998) *Teaching Note, Bidding for Antamina*, Harvard Business School, Boston, February 9, 1998.

Walzer, M. (1995) *Exodus and Revolution*, Basic Books, Inc. Publishers, New York.

Walzer M. (2004) *Interpretation and Social Criticism*, Harvard University Press, Cambridge, Massachusetts.

WBS (Wits Business School Website) (2008) available from http://www.wbshost.co.za/content/view/331/185/ (accessed 10/07/2008).

Wiley, (2008), available from: http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0471434256.html, (accessed 21/05/2008).

Wooldridge, S.C, Garvin, M.J., Cheah, Y.J. and Miller, J.B. (2002) Valuing Flexibility in Private Toll Road Development: Analysis of the Dulles Greenway, *The Journal of Project and Structured Finance*, Winter, 25-36.

World Bank, available from www.worldbank.org (accessed 29/05/08).

Wynant, L. (1980) *Essential Elements of Project Finance*, Harvard Business Review, May- June, pp. 165-173.

Yermack, D. (1996) Higher market valuation of companies with a small board of directors, *Journal of Financial Economics* 40, 185-211.

Yescombe, E.R. (2002) *Principles of Project Finance*, Academic Press/Elsevier Science (San Diego, CA, and London, UK).

Zenner, M. (2001) *How Risk Management Creates Shareholder Value...(by lowering the cost of debt and equity and increasing expected cash flows),* SalomonSmithBarney, Financial Strategy Group, 2/28/01.

Zikmund W. G. (2003) *Business Research Methods*, 7th edition, South Western Publishing, Ohio.

11. APPENDIX 1: LIST OF INTERVIEW RESPONDENTS

1.	Daniel Zinman	Project Finance, Standard Bank
2.	Luendran Pillay	Resource Finance, Rand Merchant Bank
3.	Michael Nahon	Owner, Red Arrow Project Finance
4.	Emile Malan	Project Finance, Nedbank
5.	Alastair Campbell	Director, Project Finance, Standard Bank
6.	Robert Gecelter	Project and Infrastructure Finance, Investec
7.	Pierre de Villiers	Owner, Red Arrow Project Finance
8.	Collin Clark	Director, Kagiso Financial Services
9.	Greg Kinross	Chief Executive Officer, CIC Energy Corporation
10.	Mike Peo	Director, Nedbank
11.	Desnei Leafcamp	International Finance Corporation
12.	Bongani Nqwababa	Financial Director, Eskom
13.	Conrad Hefer	Managing Director, Cresco Project Finance
14.	Inge Mulder	Financial Director, National Roads Agency (NRA)
15.	Brigitte Bailey	Partner, Webber Wentzel
16.	Dr Rod Crompton	Regulator Member, National Energy Regulator of South Africa (NERSA)

12. APPENDIX 2: QUESTIONNAIRE

Universiteit van Pretoria
University of Pretoria

GORDON INSTITUTE OF BUSINESS SCIENCE

Lessons for South Africa from international Project Finance case studies

Research Questionnaire

MBA Research Project

David Rabinowitz

drabinowitz1@gmail.com

082 973 8005

INFORMED CONSENT FORM

I am conducting exploratory research on the Project Finance Industry in South Africa. I am trying to asses what lessons can be learned from international Project Finance case studies for South Africa and where more research needs to be done in the area of Project Finance.

Our interview is expected to last 1 hour where I will ask a series of questions relating to your experience of Project Finance in South Africa. Your participation is voluntary and you can withdraw at anytime without penalty. All data will be kept confidential. If you have any concerns please contact me or my supervisor. Our details are provided below

David Rabinowitz
Drabinowitz1@gmail.com
082 973 8005

Professor Mike Ward
Mike.ward@up.ac.za
011 771 4100

Signature of Participant: _____

Date_____

Signature of Researcher_____

Date:_____

SECTION 1: DEFINING PROJECT FINANCE

1. How do you define Project Finance? Do you have a standard definition and if not how do you decide what is Project or Corporate Finance?
2. Would you agree that the defining characteristic, the *sine qua non* of Project Finance, is non-recourse debt?

SECTION 2: STRUCTURING PROJECTS

3. What are the main reasons why you or your clients use Project Finance?
4. What do you see as the disadvantages of using Project Finance?
5. Do you involve Multilateral Development Agencies in your projects and if so for what reasons?
6. Please comment on the following quote: “Uneconomic deals are not sustainable over the long term regardless of the financial structure.”
7. What do you find are the most important determinants of capital structure in Project Finance deals?

SECTION 3: VALUING PROJECTS

8. Would you agree that “the starting point of any valuation is the economic logic of the project” and if so, why?
9. Would you agree that more complex projects require more complex valuation techniques?

10. Do you ever use/ask for your service provider to use multiple discount rates in your valuations?
11. What valuation techniques do you use?
12. Do you ever use other more complex methods such as Real Options Analysis or Monte Carlo Simulation? Why or why not?

SECTION 4: MANAGING PROJECT RISK

13. What are the most common risks faced in South African Project Financed projects?
14. Please comment on the following statement: “Project contracts are constructed to allocate risk but despite all the time and effort they may still be incomplete.” Do you find this to be the case?
15. **“**Risk management can be looked at in three stages: Identification, Assessment and Mitigation” Do you agree and why?
16. How do you define completion in your contracts with EPCM and other service providers?

SECTION 5: FINANCING PROJECTS

17. What do you see as the main advantages and disadvantages of:
    - Bank debt
    - Bonds
18. “As leverage increases Debt Service Coverage Ratio decreases and IRR increases. There is [therefore] a trade off between project financial risk and sponsor returns” Do you agree and if so how do you manage this?

19. What are the most important considerations in a syndication strategy?
20. “There is a 'rule of thumb' that the lead arranger should hold approximately 10% of the loan on its balance sheet” Do you find this to be so in South Africa?
21. Is there a need for Islamic Finance in South Africa?
22. Are South Africans involved in Islamic finance globally and if so do they have the knowledge and expertise to deal with it?
23. Is Project Finance riskier than Corporate Finance? Why or why not?
24. What sequence do you use when raising debt? Four examples are:
    - 1: Start with 100% debt and slowly add equity
    - 2: Start with some equity and slowly add debt
    - 3: start with equity and add large amount of debt and then some more equity
    - 4: start with some equity, add more equity and then add large amounts of debt