

# **UGSM-Monarch Business School**

## **Doctoral Dissertation Proposal**

Factors Influencing the Award of Toll Road Concessions:  
The South African Perspective

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## **1. ABSTRACT**

Over the past two decades growing demand for infrastructure has driven the private provision of roads, power, telecommunications, water and sanitation, and other public services in developing countries. Governments short of resources have sought alternative methods of financing transport improvements without affecting their fiscal situation. Charging tolls, too, has become an attractive option for managing traffic on increasingly congested roads. Although the benefits of involving the private sector in building and operating toll roads are apparent, some countries have faced difficulties in managing the processes involved. Like any private infrastructure project, toll roads require sound partnerships between the public and private sectors. A fair allocation of responsibilities and a fair distribution of risks are key elements in any such partnership. Concessioning is becoming a key trend with regard to the provision of infrastructure in South Africa too, as evidenced by the increasing number of toll road concessions. For bidders to have a possibility of winning a concession, a thorough understanding of the factors affecting the award of toll road concessions is necessary. The study, through the use of in-depth interviews with selected respondents and an analysis of *pro forma* bid documentation, will seek to determine these factors. The bidding process, the regulatory framework protecting the consumer, and the determination and allocation of risk will be investigated and their impact on the award of concession bids examined. A dynamic model of the concessioning process, which demonstrates the impact that different bidding strategies are likely to have on a toll road concession in South Africa, will be formulated.

## **2. BACKGROUND TO SOUTH AFRICA INFRASTRUCTURE PROVISION**

Infrastructure services have unique characteristics that invariably generate special interest among governments regardless of their political economic belief. While it is true that infrastructure in the 19th century was largely owned and managed by private entities in many countries around the world, with the increasing scale of infrastructure provisioning to an expanding consumer set over the years, governments, as guardians of public interest, were compelled to intervene if not as owners, then certainly in a regulatory role. Lall and Rastogi (2007) states that over the 20th century, infrastructure development and service delivery reverted in varying degrees across different countries to the state preserve. In fact, by the second half of the 20th century, infrastructure came largely within the state domain in emerging market economies. Since the 1990s, however, endeavours to invite private interest in the infrastructure sector have been renewed (Lall and Rastogi, 2007). However, it is assumed that given the strategic importance of infrastructure services, their role as public goods and their natural monopoly characteristics and associated externalities, and often large nature of investments involved, the state can never fully relinquish its role as the key player in this space.

The most commonly used definition of a public good is 'Samuelson's definition', which says that a public good is "a good that, once produced for some consumers, can be consumed by additional consumers at no additional cost" (Samuelson, p387). He developed what he claimed to be "a pure theory of government expenditure on collective consumption goods" (p388). In addition, he virtually denied a role for political economy by concluding that any further exploration of the problem raised by public

expenditure “would take us into the mathematical domain of 'sociology' or 'welfare politics'” (p389), and that it may turn out to be pure luck that within this domain there happened to be the sub-sector political economy with the 'simple' properties of traditional economics. In keeping with the above it can be argued that, be it: airports, power utilities, water utilities, or highways the story of infrastructure development in most countries is closely linked to their political histories and the changing roles of governments in their economic development. South Africa is no exception.

South Africa's early roads began as footpaths and wagon tracks, which were subsequently developed into earth roads and then gravelled roads (Houghton, 1976 and Floor, 1985). Apart from a structural data break between 1956 and 1957, total roads essentially display a plateau effect after 1940. In 1938, the government decided that all national roads were to be paved, rather than 25 per cent as previously planned. Due to the above, we see that prior to 1940, the development of South Africa's national and provincial road network is best measured by total (mostly unpaved) roads, whereas after 1940 road development is best measured by paved roads. Between 1940 and 2001, South Africa's national and provincial paved roads increased from around 1,243 miles to around 39,146 miles (Perkins *et al*, 2005).

Since the end of the cold war and the concomitant triumph of liberal economic doctrine throughout most of the world, there has been a relentless global advance towards minimising the role of the state in the economic sphere of society (Hill, 1998). A parallel development has been rapid globalisation of the world capital and financial markets.

Kegley and Wittkopf (1996, p255) discuss “the end of geography, a state of economic development where geographic location no longer matters in finance”.

These two processes found expression in the large-scale privatisation of state owned assets and the reversal of government intervention in the funding and running of large scale infrastructure projects (Kapur, 1995). This benefits governments in that the responsibility for funding, running and maintenance of infrastructure has shifted to the private sector. This reduces the need to borrow money thus reducing fiscal deficits, and is generally intended to increase the quality of the service delivered (Mustafa, 1999).

South Africa has a history and tradition of major state involvement in service and infrastructure provisioning. In addition, there exists a strong labour movement that is formally allied to the current government, and formally opposes privatisation (Bramble and Barchiesi, 2003). Despite this, however, there are two issues at play as to how South Africa approaches public goods: (i) a shift from a statist and mercantilist approach towards a liberal approach looking at markets as the economic saviour, (Webster *et al*, 2012) and (ii) a need to reduce fiscal deficits, to attract foreign direct investment, and to improve service quality which resulted in South Africa following the lead of the rest of the world in the privatisation of services and infrastructure (Van Huyssteen, 1998).

There are various ways of approaching privatisation, ranging from service contracts and time limited concession agreements to the outright sale of state assets. There is currently great interest and urgency in all of these types of privatisation methods in South Africa (Gill, 1999). Consequently, the number of concession agreements, particularly relating to toll roads, are on the increase in South Africa.

To try to accommodate various ideological agendas within the current South African government, it has been suggested that the granting of concessions is sometimes linked to additional requirements that do not relate directly to the primary objectives of the concession itself (Grawitzky, 1999 and Evelyth, 1998). The South African National Roads Agency Limited (SANRAL) manages and maintains the national road network in South Africa on behalf of the Minister of Transport. The South African national road network constitutes 74 percent non-toll roads that are maintained from an allocation from Treasury, 8 percent public agency toll roads, and 18 percent concession toll roads (SANRAL, 2010).

All concession agreements in South Africa are for a period of 30 years. Concession agreements are regarded as an integral component of the South African government's strategy to seek alternative financing sources to replace taxes for funding South Africa's road network. The three main concession toll roads currently in place are:

- N4 Maputo Development Corridor: a 504-kilometer corridor that extends from the Gauteng border on the N4 to Maputo in Mozambique. The concessionaire is Trans African Concessions (TRAC) and the total concession was valued at R3,0 billion (US\$375 million);
- N3 Toll Road: a 418-kilometer corridor from Cedara in KwaZulu Natal to Heidelberg in Gauteng. The concession was valued at R3.5 billion (US\$437,5 million) and the concessionaire is N3 Toll Concession (Pty) Ltd (N3TC), and;
- N4 Platinum Highway: a 380-kilometer portion of the N1 between the N1/N4 system interchange in Tshwane and the Warmbaths interchange, westwards through Akasia, Brits, Rustenberg, and Zeerust to the Skilpadhek border post

with Botswana. The total concession was valued at R3.2 billion (US\$400 million) and the concessionaire is Bakwena Platinum Concession Consortium (Pty) Ltd (BPCC).

### **3. THE MAIN RESEARCH QUESTION**

Despite a history of state control of infrastructure monopolies and a labour movement opposed in principle to the issue of privatisation, the South African government is following global trends in privatising most of its assets. In line with this trend, a number of toll road concessions have been awarded to private bidders during the last few years, with more such concessions planned for the future (SANRAL, 2003). To participate in this process any potential bidder has to be aware of the concessioning process as it applies to toll roads in South Africa, and of the factors determining their award. Thus, keeping this important point in mind the research question have been developed as:

#### **Main Research Question:**

"What are the important factors that influence the award of toll road concessions in South Africa?"

#### **3.1 The Sub-Research Questions**

The review of the literature suggests that the following three issues are likely to have an important bearing on the award of infrastructure concessions:

1. Firstly, an understanding of the bidding procedures and evaluation criteria governing the award of toll road concession appears to be important for anyone



trying to formulate a bid that has a reasonable chance of success. Subsidiary issues, such as corruption, transparency and legitimacy of the concessioning process, will determine whether a potential bidder should in fact participate in the process.

2. Secondly, the regulatory environment seems to play an important part in the concessioning of infrastructure monopolies. An examination of this is likely to provide important lessons to be applied to potential problems and risks in the post award period that have to be taken into account when bidding.
3. Lastly, the literature suggests that the issue of risk is a critical factor for all infrastructure concessions. Factors, such as: which risks are important, who carries them and how they can be alleviated have an important bearing on the viability of any bid. Should the assessment of risk be incorrect, the bid will be either uncompetitive, due to a higher cost of capital than warranted, or it might result in substantial problems and monetary losses over the term of the concession, due to the underpricing of the risk present. These issues must therefore be identified at the outset and incorporated into any concession bid.

### **Sub-Research Questions:**

The sub-research questions that emerge from the preliminary literature review are thus as follows:

- “What are the procedures and evaluation criteria governing the award of toll road concessions and how transparent are they?”

- “What impact does the regulatory environment have on the award of toll road concessions?”
- “How do the identification, mitigation and allocation of risk affect toll road concession bids?”

The investigation into the factors influencing the award of toll road concessions in South Africa will consider the above sub-research questions in an attempt to further clarify the and respond to the main research question.

### **3.2 Research Relevance**

The South African government is following the global trend by privatising an increasing number of its assets. In line with this trend, toll road concessioning is gaining increasing importance in South Africa, as a means of providing the required road infrastructure despite a general lack of government capacity and funding. To be successful, concession bidders participating in this process should be aware of the major factors affecting the award of toll road concessions. In addition, governments intending to embark on toll road concessioning programs need to be conscious of the factors that might attract or discourage potential bidders. The relevance of this study lies in the detection of these factors, as well as the discovery of their inter-relationships as part of a dynamic system. It is hoped that this research will result in a better understanding of the system at large along with the factors, processes and procedures involved which in turn may lead to possible redesign and the future saving of valuable time and money for all parties involved. It is further hoped that the results of the investigation within the South African concession process may eventually lead to the implementation of similar

studies in other countries facing the same issues and thereby create a continuous process of improvement.

#### **4. PRELIMINARY LITERATURE REVIEW**

The literature review provides an overview of the theory of the concessioning of infrastructure monopolies. This includes the bidding processes, broad award criteria and the post bidding contractual arrangements.

The issue of regulation of private infrastructure monopolies will be investigated and the regulatory objectives and methods will be discussed in some detail. The transparency and consistency of the regulatory regime are highlighted as being crucial to the success of a concession.

Literature on finance for infrastructure concessions will then be examined, with a special focus on the project finance approach, which relies on debt as a major source of funding, with limited recourse to the equity holders. Sources and types of finance will be examined, as well as issues around the cost of capital and the required return on investment.

Public perception of corruption is very crucial. It provides insights into how corruption destroys lives and diminishes confidence in those in positions of authority.

Transparency International (2011) places South Africa in position 64 out of 183 countries. Potential presence of corruption practices, or lack thereof, on the bidding process will be examined as part of transparency.

Finally the issue of risk will be considered. The levels of risk throughout the life of an infrastructure project will be considered and the various types of risk faced by project participants will be discussed. Ways of structuring the concession company in order to facilitate the allocation of risk will be examined, as well methods of risk mitigation.

#### **4.1 Privatisation of Infrastructure**

Gwilliam (1998) perceives the primary objectives of privatising infrastructure as being the need to reduce the fiscal burden carried by the state, while at the same time attempting to “increase the dynamism of supply” (p1). This is in agreement with Fisher and Babbar (1996), who report that, “Interest in private [infrastructure] is particularly strong because governments require alternative sources of financing” (p1). Gomez-Ibanez and Meyer (1993) write that, “proponents contend that private operators can build or operate a system more efficiently ... or will be more innovative in the facilities they design and the services they offer” (p100).

##### **4.1.1 *Infrastructure as Natural Monopoly***

Most infrastructure, especially network infrastructure, such as such: roads, transmission lines etc., can be considered to constitute natural monopolies, since it would be impractical, uneconomical and wasteful to duplicate infrastructure installations. Viscusi, Vernon and Harrington (1995) state that, “if an industry is a natural monopoly, then cost efficiency requires a single firm to operate in the industry” (p413).

They further comment that, to prevent a single supplier or operator from setting prices at the monopoly level that may result in welfare losses, some form of regulation will be

required. Conversely, if potential entrants view one supplier as earning above normal profits, they may be tempted to enter the industry and undercut the monopolistic price. While this is likely to drive prices down, it will also cause a loss of economies of scale and result in an average cost, which is higher than if only one firm operated in the market. “Given scale economies, average cost is higher than if only one firm produced” (Viscusi *et al*, p413).

#### *4.1.2 Ways of Preventing Monopoly Pricing*

To solve the problem of monopoly pricing, Viscusi *et al*. (1995) discuss two major approaches that have historically been used to overcome this:

- State ownership of infrastructure monopolies: where the government is responsible for construction and operation of a particular facility has been the dominant approach in the past, but there are currently world-wide trends away from this model.
- Private sector participation: through the issuing of time limited infrastructure concessions, overseen by a regulator whose function it is to define service quality and to prevent monopolistic pricing. Viscusi *et al*. (1995) comment that franchises are usually awarded by a tendering process or through a process known as franchise bidding.

#### *4.1.3 Infrastructure Concessioning*

Gwilliam (1998) defines the process of concessioning as: “the transfer of control of the [infrastructure] to a private management partner for a fixed period” (p2). This normally

entails issuing a specific concession to the firm that proposes to charge the lowest price for a service while meeting certain criteria concerning quality of service. Viscusi *et al.* (1995) argue that if there is sufficient competition during the bidding stage, the resultant price would be set at the lowest average cost, representing the social welfare optimum and affording the winner normal profits.

## **5. RESEARCH METHODOLOGY**

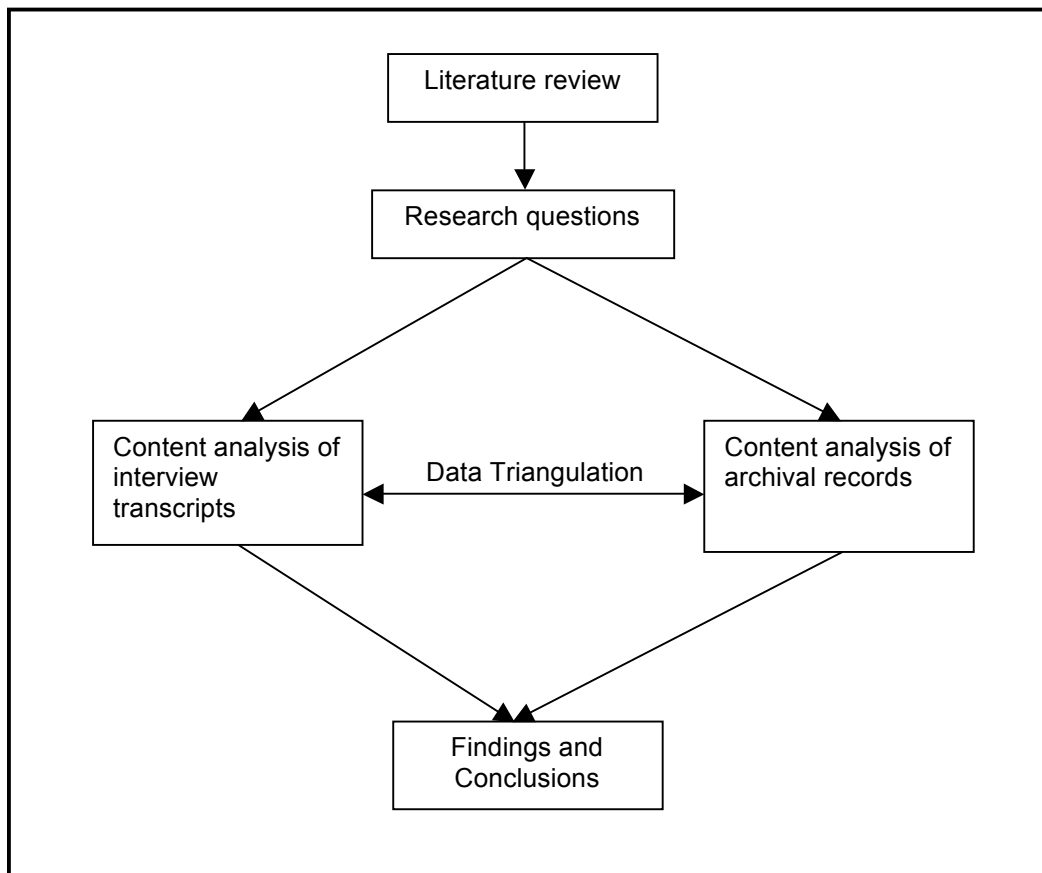
### **5.1 The Nature of the Study**

The study will attempt to answer the main research question by way of investigating several sub-research questions, which are intended to encapsulate the wide and diverse factors that inform and affect the evaluation criteria. Since the preliminary literature review indicates that these criteria go far beyond simple quantitative indicators and measures, it is thought appropriate to structure the investigation in a qualitative fashion. The qualitative research methodology has been determined to be the most appropriate method in order to uncover personally held beliefs and subtle understandings held by the research participants that may assist in providing more deep and colourful meaning to the data. The aim of qualitative research is to uncover, organise and interpret knowledge, insights and viewpoints that help to explain and clarify key organisational and process phenomena. Zikmund (1997) states that usually such research "provides greater understanding of a concept ... rather than providing precise measurements or quantification" (p102). Schmitt and Klimosky (1991) make the point that qualitative research "is more an approach than a particular design or set of techniques" (p115).

## 5.2 The Research Design

The research design to be employed is shown schematically below. The literature review informs the research questions, to which answers will then be sought using two separate, qualitative based, research methods as previously discussed: interviews and desk research.

### **Schematic Representation of Research Methodology**



### 5.2.1 *The Role of the Literature Review*

The role of the literature review will be to identify the theories, issues and experiences underlying the award of infrastructure concessions in general. This process is

instrumental in responding to the main research question that is addressed by two different research methods addressed above.

### **5.2.2        *Methods of Investigation***

To counteract possible biases introduced into the research by a single qualitative method, Schmitt and Klimoski (1991) argue that researchers are “particularly concerned about the weakness of their measures or the tools that they use to develop these measures. As a result they often construct and use multiple indices to get at phenomena of interest. Thus, while recognising the potential fallibility of any one measure, they seek evidence of convergence. This is sometimes referred to as triangulation” (p118). Denzin (1970) describes data triangulation as “attempts to gather observations with multiple sampling techniques” (p472). To prevent or reduce the possible bias by the use of a single method, data triangulation will be applied incorporating standardised non-scheduled interviews with industry insiders and desk research to analyse qualitative factors imbedded in the archival material related to the previous award of toll road concessions in South Africa.

It is expected that where the two methods point to similar answers and conclusions, they should greatly enhance the validity of the findings. Similarly, areas showing contradictions between the two methods should highlight some interesting insights for further study. In addition, both methods should provide additional insights that will otherwise be hidden or remain uncovered if only one method were to be employed.



### 5.2.3 *Standardised Non-scheduled Interviews*

Schmitt and Klimosky (1991) remark that, “Interviews have been characterised as conversations with a purpose” (p139). They considered interviews to be the best approach for uncovering and interpreting the perspective of a respondent and for enabling a meaningful and in-depth description of the issues being researched. Bryman *et al* (1988) claim that such a qualitative research methodology removes the decision and judgement of relevance from the researcher and places it with the respondent.

Standardised non-scheduled interviews are semi-structured interviews, that are: “normally a mixture of pre-coded and open ended questions combined in a questionnaire” (Crouch, 1984, p183). This retains the interview within the overall structure of the questionnaire, but allows the respondent to answer the open-ended questions in an uninhibited and undirected way that has the potential to uncover personally held beliefs.

To try to elicit valid and uncontaminated responses from the respondents in an interview, the questionnaire will be designed according to the “Funnel Technique” (Schmitt and Klimosky, 1991, p142), to allow the interviewer first to follow a broadly structured line of questioning which permits the respondent to answer a certain question in a free and unrestrained way. Specific follow-up questions will then be asked to elicit elaboration on the earlier responses in an attempt to deepen and round off the data.

Schmitt and Klimosky (1991) state that, “A key feature of qualitative interviewing regardless of the specific question sequence is the use of follow up questions or probes” and further argue that, “By going from the general to the specific, there is less

of a likelihood that the respondent's answer will become contaminated or unduly influenced by the questions themselves" (p142).

#### *5.2.4 Desk Research*

Copies of pro forma bid documentation, outlining and reflecting the award process for South African toll road concessions will be obtained from various sources. This material will be used to provide an empirical base line for the analysis of the various parameters that are contained in the bid process while illuminating the level for each parameter that is most likely to result in a positive outcome for the applicant.

#### *5.2.5 Strengths and Weaknesses of the Methodology*

The dynamic nature of qualitative research, allows large amounts of data to be obtained quickly. The methodology allows for immediate follow up and provides information suggested by tone quality and body language. Weaknesses include lack of definity and standardisation due to the often small sample size employed and the dynamic nature of process. There is also the potential that the researcher might also influence responses. Jones (1985a) also makes the point that the process is highly dependent on the availability and co-operation of a small group of key informants.

The accuracy of the process of transcription and analysis will be greatly facilitated by the interview recordings. However, Schmitt and Klimoski (1991) mention that "awareness of being recorded usually creates a mind set that everything that is recorded is for the record. This will have inhibiting effects" (p145). It is possible that

some respondents might be on occasion very guarded in their responses. Where this occurs it will be noted and included in the presentation of the research findings.

### **5.3 The Sample**

Schmitt and Klimoski (1991) state that, “as a rule, qualitative studies will typically involve small samples” (p117) and note that greater insights can be gained from investigating a small sample in depth, rather than investigating a large sample in a more superficial way. “The focus on small samples has several implications, with one result being greater insight into a particular case” (1991, p117).

Since the research will be qualitative in nature, a balance has to be found between too few interviews, resulting in the possibility of not uncovering key and critical information and too many interviews where the ability to uncover new data may be hidden in the vast quantity of narrative. The researcher where necessary will use qualitative research analysis packages, such as NVIVO, to assist in the identification of commonly used terms and commonly held beliefs between the participants. The fact that South Africa as a country is relatively small and that the number of potential participants available with experience in the concession process is considered limited the research is expected to make use of between 10 and 20 respondents. Due to the expected limited number of respondents, a non-probabilistic sampling technique, a judgement sample, will be used.

The sample of the interview respondents will be drawn from the following spectrum of organisations, identified by the literature survey as being of importance:

- The Concessor: South African National Roads Agency
- Concession Bidders: Both successful and unsuccessful
- Commercial Lenders: Including infrastructure financiers
- Consultants: To the concessor and individual bidding consortia

## **5.4 Data Analysis**

The data obtained from both the interviews and archival material will be analysed by means of content analysis. Content analysis observes and analyses the content of diverse media to identify the specific information content as well as the characteristics of the messages. Zikmund (1997) makes the point that content analysis is “more sophisticated than simply counting the items; it requires a system of analysis to secure relevant data” (p277). In this regard the research will make use of statistical packages specifically designed for qualitative analysis such as NVIVO.

### **5.4.1 Data Mapping**

Data Mapping is a system of analysis that will be used on the content of the interviews and archival material. Jones (1985b) defines Data Mapping as “modelling peoples’ beliefs in diagrammatic form” (p61). Data Maps consist of two elements. Firstly, the respondents' perceptions and opinions relate to the situation under consideration. Insightful and recurring perceptions and opinions are extracted and grouped according to common themes. Secondly, the relationships and interdependencies between these themes and ideas are indicated by linking them with arrows. The datamaps will be constructed using the following procedure outlined by Brehm (1994):

- Each transcript will be read a number of times, without reference to any of the other interviews;
- Related concepts and ideas will be colour coded by highlighting them with coloured pens;
- These will then be copied onto a single sheet of paper and grouped together according to a number of common themes. Where possible the original words of the respondents will be used to try and retain the richness of the information. The relationships between themes will be indicated using arrows; and
- Finally, the completed data maps will be cross-checked against the original interview, to ensure that they represent a fair reflection of the respondents' views and opinions.

Each individual Data Map will thus represents a diagrammatic summary of the interview, showing the way the respondent views and makes sense of the problems. Concepts that are related, or which represent a progression of thought within a theme, will be placed together. Finally, each map will be reviewed and the constructs and relationships that appear to represent substantive concepts or categories of data will be drawn out for discussion as part of the research results.

## **6. REPORT STRUCTURE**

The report will seek to establish the main factors leading to the award of toll road concessions in South Africa. Apart from the introductory Chapter One which will also deal with research problem and research questions to be explored, the research will contain a further five chapters, including a conclusion chapter pointing to the potential for future study areas.

Chapter Two will provide an overview of the literature relating to the area under investigation. It will begin with discussions of the theory of infrastructure monopolies and concessioning of seminal authors that have proved to be resilient over time. Bidding processes, broad award criteria and the post bidding contractual arrangements will also be discussed. This will lead to a discussion on the issue of regulation regarding what are considered private monopolies. Regulatory objectives and methods will be discussed in some detail. Ways of financing infrastructure concessions will also be examined, with a focus on the project finance approach, which relies heavily on debt as a major source of funding, with limited recourse to the equity holders. The various types of risk faced by project participants will be discussed, as well as the principles and measures for allocation and mitigation.

Chapter Three will discuss the methodology to be employed within the research as previously discussed in the preceding paragraphs. As discussed, the research will be of a qualitative method employing a triangulation approach in an attempt to more fully synthesise the data to arrive at thoroughly examined conclusions with respect to responding to the main research question at hand.

The results of the research will be presented in Chapter Four. They will be presented in terms of the main research question in conjunction with the sub-research questions identified in Chapter Three while providing a further elucidation of the research problem and potential new insights.

Chapter Five will evaluate and discuss the research results. The results from the previous chapter will be discussed in conjunction with the issues raised in the literature

review for each of the research questions. A composite picture of the factors affecting the award of toll road concessions will emerge. This will then be consolidated into a section on potentially useful bidding strategies for toll road concessions in South Africa and will introduce a new potential concession model that will better address the identified issues and existing constraints of the present system.

Finally, in Chapter Six concluding remarks and possible areas for future research will be suggested.

## **7. RESEARCH PLAN**

Participant interviews will take place over a two-month period from August to September 2012 for approximately 1 hour and 30 minutes in length each at a location that is amenable to the participants. The following schedule represents the best estimate of important milestones for the completion of the study.

Dissertation Research Timeline	
Date	Stage
October 2011 - January 2012	Research Start / Proposal Phase
February 2012 – April 2012	Initial Literature Review
May 2012 - July 2012	Final Literature Review
August 2012 – September 2012	Interview Design Finalisation Preparation and Scheduling of Meetings
October 2012 – December 2012	Interviewing of Participants Follow-up Interviews
January 2013 – June 2013	Analysis of Data
June 2013 - October 2013	Writing of Manuscript
October 25, 2013	Completion and Submission

## 8. RESEARCH BUDGET

The total cost of the research is estimated to be approximately US\$26,000.00. The author will fund these costs privately. No scholarly or governmental grants will be sought or used in carrying out the research. No extra supervisory costs or other costs are being requested from UGSM-Monarch Business School. The budget is presently fully funded and research may begin immediately.

Research Budget (in US Dollars)	
Item	Cost
Transport Cost	7,000
Meals: 42 Days @ 100.00	4,200
Reproductive Expenses - Questionnaires	300
Reproductive Expenses – Manuscript	700
Qualitative Analysis Software - NVIVO	800
Miscellaneous Supplies	500
Telephone Cost Long Distance	1,500
Books & Article Purchase	4,000
Digital Recording Software & Transcription Cost	2,000
Hotel Expenses	5,000
<b>Total Research Cost</b>	<b>\$26,000</b>



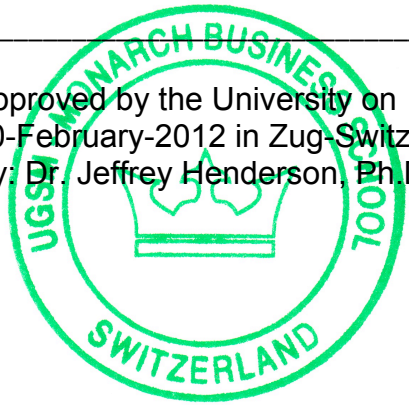
## **9. RESEARCH PROPOSAL APPROVAL**

The contemplated research proposed herein has been approved by the University and the student may commence the research immediately. The student is not to deviate from the proposed research unless expressly confirmed by both the Supervisor and the University in written form.



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Approved by the University on  
10-February-2012 in Zug-Switzerland  
By: Dr. Jeffrey Henderson, Ph.D.



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