An Economic Analysis of Sports Performance in an African and a South African Context

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ABSTRACT

The South African Sports Confederation and Olympic Committee (SASCOC) have been criticised by the media for South Africa's poor performance at the 2008 Beijing Olympics. Prior to the Olympic team's departure SASCOC had anticipated that in all likelihood South Africa (SA) would be eligible for at least eight medals. The South African Olympic team returned from Beijing having won only a single silver medal. The failure of the Olympic team was described as a symptom of a lack of sufficient resources, a lack of prioritisation in resource allocation, and a lack of quality administration failing to identify talented individuals.

The purpose of this study is to develop further insight into the socio-economic and organisational determinants that have impacted on South African sports performance. May (1997) propounds that a country's success in sports is directly related to the economic resources that are available for those sports. However factors that are used to determine the levels of success for developed countries are not necessarily the same, or bear the same weight, as for developing countries. The premise of this study is to identify specific factors that increase success in sports in developing countries, or to at least identify factors which hinder sports performance in developing countries.

In this exploratory research, the methodology includes a sequential two-phased mixed-method approach. The first phase of the research includes the development of an econometric model utilising variables identified in the literature review. The data collected and interpreted together with the literature review forms the basis of the semi-structured interview, i.e. phase two.

This study finds evidence that suggests that South Africa's performance in sports is dependent on socio-economic and organisational determinants. However the results of the study suggest that South Africa has sufficient resources to compete internationally if appropriately mobilised.

The failure of the South African Olympic team is attributed to the inherent weakness of the institutions within South Africa. This study uniquely shows that sports performance is resource dependent; and is especially dependent on the appropriate investment in education and health. Furthermore, South Africa is inefficient in its utilisation of resources when compared to other African countries as relatively resource deficient African countries often perform better in sports than South Africa.

DECLARATION

I, Riyas Fadal, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Riyas Fadal

Signed at ……

On the …….. day of …… 2009

DEDICATION

My creator,

My wife, my soul mate, my strength,

My children, my inspiration,

My mother,

My father,

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I am thankful to the following people for their valuable contribution:

- To my supervisor, Professor John Luiz. Thank you for your unwavering support, open door policy, encouragement, enthusiasm, guidance and willingness to share your expertise. I will forever be in your debt for your contribution to my development and ongoing career aspirations.
- To the interviewees. Thank you for your time, willingness and honesty. I am honoured by your commitment, patriotism and dedication towards sports and South Africa.
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- To my friends, especially *Syndicate Six*. Thank you for being you.
- To my family. Thank you for your love, sacrifice and for your inspiration.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

	Abbreviation
All Africa Games cumulative weighted medal score	wtdAfrica
Beijing Olympic Games cumulated weighted medal score	wtdOlympic
FIFA cumulative point's allocation	FIFApoints
Gross Domestic Product	GDP
International Federation of Association de Football	FIFA
Ordinary Least Squares	OLS
Revealed Comparative Advantage	RCA
South Africa	SA
South African Sports Confederation and Olympic Committee	SASCOC
Sub-Saharan Africa	SSA
United States of America	USA

CHAPTER 1: INTRODUCTION

1.1 Purpose of the Study

The purpose of this research is to explore the socio-economic and organisational determinants affecting African sports performance, and in particular, South Africa.

There are numerous studies that have analysed factors which contribute to success in sports performance, however these have not accounted for specific factors affecting developing nations (Bernard and Busse 2004; Hoffmann, Ging and Ramasamy 2004; Johnson and Ayfer 2004; Cote, Macdonald, Baker and Abernethy 2006). This research report will attempt to explore inherent elements which have contributed to South Africa's performance at various international competitions.

1.2 Context of the Study

The South African Sports Confederation and Olympic Committee (SASCOC) have been criticised by the national and international media for South Africa's poor performance at the 2008 Beijing Olympics (Lemke 2008). Prior to the Olympic team's departure SASCOC had anticipated that in all likelihood South Africa would be eligible for at least eight medals. The South African Olympic team returned from Beijing having won only a single silver medal. The failure of the Olympic team was described by the president of SASCOC as a symptom of a lack of sufficient resources, a lack of prioritisation in resource allocation, and a lack of quality administration failing to identify talented individuals.

Interestingly, research conducted internationally to identify factors that affect sports performance, focus on resource endowments, a country's population and cultural and social resources (Kiviaho and Makela 1978; Bernard and Busse 2004; Johnson and Ayfer 2004). According to the studies, success in sport is dependent on socio-economic factors that include finances, demographics,

culture and athlete dependent factors. It is suggested that countries that are successful in sports have an abundance of financial resources, have a large population and an appropriate climate. The studies tend to suggest that countries such as the United States, Great Britain, and Australia have an advantage in sports competitions due to their economic endowments. The research fails to explain why poor countries are often able to compete successfully, and why countries economically less successful than South Africa were able to achieve more medals at the Beijing Olympics.

May (1997) argued that success at the Olympics should be looked at relative to economic resources and that medal achievement should therefore be weighted relative to a country's Gross Domestic Product (GDP) per capita. May's classification ranks countries according to their efficiency of medal achievement relative to resource endowments. Utilising May's classification criteria countries including Mongolia; Jamaica; Zimbabwe and Kenya top the list of achievement at the Beijing Olympics. The United States of America (US) and Great Britain performed well below expected for their resource endowments. Similarly, with May's classification, South Africa performed well below expected, and should have won at least five medals. According to May, the discrepancy between actual and predicted achievement for a given amount of resources represents the total inefficiency of resource utilisation.

The aim of this study is to develop further insight into the variables that affect socio-economic and organisational determinants that have impacted on South African sports performance. May's (1997) argument propounds that a country's success in sports is directly related to the economic resources that are available for those sports. This research considers the notion that factors that are used to determine the levels of success for developed countries are not necessarily the same, or bear the same weight, as for developing countries. The premise of this study is to identify specific factors that increase success in sports performance in developing countries, or to at least identify factors which hinder sports performance in developing counties.

The results of this study may be utilised by diverse sectors of South Africa, as well as internationally in understanding the factors that contribute to successful performance in sport. In essence, the results of this study can further be used to understand the factors that drive performance in other sectors, both public and private.

The results from this study will contribute to a body of economic literature, especially for developing countries in the following areas of economics: sports economics; efficiency theory; and institutional economics.

1.3 Problem Statement

1.3.1 Main problem

The purpose of this research is to explore the socio-economic and organisational determinants of African sports performance, with an emphasis on South Africa.

1.3.2 Sub-problems

The first sub-problem is to explore the socio-economic variables that affect sports performance.

The second sub-problem is to identify the organisational variables that affect sports performance.

1.4 Significance of the Study

Sport and recreation is able to have a significant impact on a country's economy. The sport industry creates direct economic benefits through employment, revenue from events, consumables and general taxation. In fact, sport can be considered as a composite sector that contributes to hospitality and tourism, textiles though the manufacture of sports clothing, and employee productivity through activity and health.

Sports has assumed an ever greater role within the globalisation process and in the regeneration of national identity (Nauright 2004). The Olympic Games, The Federation Internationale de Football Association (FIFA) World Championship and other significant sporting events have become highly sought after commodities as developed countries, and developing countries tend towards event-driven economies (Chappelet 2005). These events are used as a global platform to create an awareness of the host city, and present the country as an exciting destination for tourists. In industrial countries sport contributes to about two percent of the GDP annually (di Cola 2004). In the United States, the sports sector includes the manufacturing of sports goods; sports related services and sports events. It was valued at US$ 152 billion in 1995 and was considered to be the 11th largest industry at the time (Ashton, Gerrard and Hudson 2003).

In 2003, South Africa was awarded the rights to host the 2010 FIFA World Championship. In South Africa, sports events have been able to stimulate great excitement and enthusiasm. Sport has been instrumental in the unification process and has been used to transcend the boundaries of racial tension and inequality (Burnett and Hollander 1999). Through sporting success in rugby cricket and soccer, South Africans have been able to forget the past and forge a new common path towards international recognition and acceptance.

The decision for a developing country to host a mega-event was debated at the second Magglingen conference on Sport and Development (Chappelet 2005). Chappelet (2005) questioned the appropriateness of the investment, and the associated opportunity cost incurred. There is an expectation that developing countries need to prioritise their allocation of resources to poverty alleviation, education, and the overall wellbeing of the country. Conversely, hosting a global event will generate job opportunities, infrastructural development, and tourism, which may lead to long term economic benefits. The enthusiasm generated from the event may stimulate and motivate mass participation in sport, which in turn would stimulate the market for sports goods, facilities, infrastructural development and sports broadcasting. Sports participation has both direct and indirect benefits. Sports is a stimulus for economic growth through its multi sector influence, and directly impacts on the health of the citizen.

This study supports the initiative of developing countries to focus on the productivity of various sectors, so as to better compete with the developed world on various platforms, especially in sports. The results of this study will guide countries in identifying and gaining a deeper insight into the variables that affects sports performance or productivity. Sports organisations from both the public and private sector will then be able to achieve success through the optimal application of the variables.

The study fills a gap in understanding factors that affect sports performance specifically in Africa and South Africa through a comparative analysis of the Olympics, the FIFA annual rankings, and the All Africa Games. Most of the research on sports performance has been focussed on performance at the Olympic Games and is biased towards developed countries for the reason that most African countries do not win medals at the Olympic Games.

1.5 Delimitations of the Study

This study focuses on the sports performance of African countries with an emphasis on South Africa.

The study focuses on socio-economic and organisational factors that affect sports performance. This study excludes biological determinants of sports performance.

For the purposes of the quantitative modelling, only countries with available data are for the following competitions are included:

- The FIFA 2008 year-end point allocation will be used as a measure of success.
- The 2008 Beijing Olympic Games, weighted medal score will be utilised as a measure of success.
- The 2007 All Africa Games, weighted medal score will be utilised as a measure of success.

1.6 Assumptions

- The FIFA point allocation, the weighted medal score for the 2008 Beijing Olympics and the 2007 All Africa Games, are fair and unbiased. They are a true reflection of a nation's success in sports.

- The respondents interviewed during phase two of the research have sufficient knowledge in the area of research to clearly articulate answers to the questions.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

There have been attempts in the literature to try and identify why some countries are more successful in sport than others. Research into the factors for perceived success in sports have been conducted internationally and have adopted various streams. These include the study of the relationship between a country's success at the Olympics Games and specific socio-economic determinants such as: Gross Domestic Product (GDP); GDP per capita, population, culture, urbanisation and polity (Bernard and Busse 2000; Kuper and Sterken 2001; Hoffmann et al. 2004; Johnson and Ayfer 2004). Alternatively, researchers have attempted to emphasise the contributions of specific organisational and athlete dependent factors for success (Cote 1999; Green and Oakley 2001; Oakley and Green 2001; Bloomfield 2002; Baker and Horton 2004; Green 2004; Hoffmann et al. 2004; De Bosscher, De Knop, Bottenburg and Shibli 2006).

The following review of the literature is presented in such a manner as to reflect the current streams of research. This will provide a comprehensive and holistic overview of the pertinent issues.

2.2. Socio-Economic Determinants

There are various studies that have found that sporting success or a lack of success is an outcome of several determinants inherent in a country. These studies suggest that countries with greater financial, social, and population resources will have a greater chance of success in sport (Bernard and Busse 2004; Johnson and Ayfer 2004; Churilov and Flitman 2006).The conclusions are based on an economic and statistical analysis of the relationship between success in sport and variables including: GDP per capita; population; nature of polity; cultural and social resources home advantage; and levels of urbanisation.

2.2.1 Economic Resources

An attempt to conduct a trans-national comparison in sport on the basis of prevailing social and economic conditions can be challenging. Comparing budgets allocated to sports for different countries can provide crude results. However, as there is a lack of available data for most countries, utilising GDP and GDP per capita may be the most appropriate method (Andreff 2001). Comparisons on the basis of the number of stadiums, track and field training areas or swimming pools per capita or their distribution could be of value, however may not be entirely feasible as private ownership and sponsorship of sports installations from one country to the next may limit the accuracy of the data. As a result, economists studying the relative effects of financial resources on sporting success have been limited to using aggregate macro-level data.

It is acceptable to assume that countries that have access to greater economic resources will have the potential to provide better training facilities for their athletes, ceteris paribus. An increased availability of resources will result in a better education, an improved health status and an increased potential for citizens to participate in sport (Bernard and Busse 2004). Theoretically, an increase in the levels of participation will result in an increased consumer demand for sports goods and services. An increase in household consumption will stimulate firm production and government investment. The increasing levels of investment in sports should further stimulate participation and economic development (Matros and Namoro 2004).

International success in sport is dependent on participation and participation levels increase with an increasing investment in sport (Johnson and Ayfer 2004). Higher-income nations consistently send more athletes to international competitions. According to Kuper (2001), income per capita was a crucial determinant of participation in the past; however, with the decreasing cost of transport and medical care, even poorer countries can afford to participate in international competitions.

In international sport, irrespective of the financial and domestic circumstances, a few countries have been able to consistently excel through a strategic allocation of resources in sport wherein they have developed a comparative advantage (Hamilton 2000). Alternatively, some countries have only focused their resources on individual sports, as opposed to team sports. During multi-sport competitions more medals can be won in individual sports than in team sports. In team sports a single team cannot win more than one medal, whereas in individual sports athletes may win a number of medals. This could explain why some countries have invested and concentrated on medal intensive sports such as swimming and gymnastics (Tcha 2004). They have been able to increase their chances of success by strategically allocating their resources (Novikov and Maksimenko 1972).

The studies fail to provide a suitable explanation as to why countries with similar economic attributes fair differently. A possible explanation may be that a country may specialise according to its relative factor endowment and intensity of its commodities (Tcha and Pershin 2003). Theoretically, to maximise on success, countries concentrate on sports in which they have a comparative advantage. Countries with higher GDP per capita have a higher Revealed Comparative Advantage (RCA) variance (Tcha and Pershin 2003). This implies that countries in the high- income group diversify, and spread their medals achieved over various sports, and those in the low income group focus on selected sports. This may also imply that high income countries can afford to specialise in more sports.

While evidence indicates that economic resources are an important consideration, there are other factors to consider. Local traditions steer talented individuals in the direction of the most popular local sport (Hoffmann et al. 2004). Countries whose culture emphasizes sport are more likely to generate sport-specific athletes. For example, India has a tendency to promote cricket as opposed to athletics. This may be a reason to further explain India’s consistent poor performance at multi-sport Games. Local traditions may also explain why athletes consistently successful in certain sports, seem to come from particular

areas. For example: distance runners from Kenya and fencers from Tauberbischofsheim in Germany (Hamilton 2000). In a study by Cote et al (2006), researchers concluded that the place of birth and therefore the benefits of being born in that particular area, contribute to sports performance.

2.2.2 Demographics

The relationship between demography and success in sports is complex. In a study by Tcha and Pershin (2003), their analysis revealed that certain countries are successful in specific sports due to their geophysical and climatic conditions. This reasoning has been utilised to try and explain Kenya's success at marathon running. Though, countries that have similar altitudes and climates have not been as successful as Kenya. According to a review by Bernard and Busse (2004), there is a lack of consensus regarding the relationship between geographic variables and sporting success. It is assumed that countries that have a relatively larger population would be able to provide a wider pool of athletes to compete, and countries with greater economic resources should be able to provide greater resources for training and success, ceteris paribus. Johnson and Ali (2004), in their study had a similar conclusion and further described that in the 1996 Olympic Games, nations that won at least one summer medal had a population five times greater than non medal populations.

A large population may be able to share the fixed costs of training, infrastructure and facilities more effectively (Rathke and Woitek 2008). Population levels alone may not be sufficient to explain success (Condon, Golden and Wasil 1999). India, with a population of 1.5 billion people is relatively unsuccessful at the Olympic Games. It appears that the effect of a large population may only be positive for relatively wealthy countries that are able to allocate additional resources to sports development (Kuper and Sterken 2001). In a study by Hoffmann et al (2002), the authors could not find evidence to suggest that success in soccer is dependent on the size of a country's population. They were, however, able to prove that success is dependent on population size if the country in addition spoke Latin or a derivative of Latin.

2.2.3 Sport and Developing Economies

As opposed to developing countries, developed countries have a greater potential to allocate resources to sport. In developing countries, government spending trends indicate contributions focussed on agricultural production growth and poverty reduction (Fan and Rao 2003). Africa's economic marginalisation has been accompanied by social deprivation, with over 48% of the population in Sub Saharan Africa (SSA) living on less than $1 a day (Luiz 2006). The poverty and inequality measures and resultant relatively poor human development indicators are reflected in Table 1.

Table 1 - Selected social indicators for world regions: 2003

Region	Life expectancy at birth	Enrolment ratio%	GDP/capita (ppp US$)	Undernourish as a % of total	Under 5 mortality	HDI
Developing Countries	65	63	4359	16	88	0.694
Arab states	67	62	5685		61	0.679
East Asia	70.5	69	5100	9	39	0.768
Latin America & Caribbean	71.9	81	7404	10	32	0.797
South Asia	63.4	56	2897	21	91	0.628
SSA	46.1	50	1856	30	179	0.515
Eastern Europe	68.1	83	7939		21	0.802
OECD	77.7	89	25915		13	0.892

Source: Luiz (2006)

There is a distinct contrast between regions especially regarding health and life expectancy, GDP per capita and educational enrolment. Over a third of the population in SSA is undernourished; the incidence of tuberculosis is 70% higher and the under-five mortality rate is twice higher than that for developing countries.

Sporting events and sports teams do not make people forget about poverty hunger and illiteracy, and hence preferentially allocating resources to sports may not be a priority in a developing country. Developing countries have a scarcity of facilities, physical education, a muscle drain, minimal capacity to host events, and a threat of corruption and financial scandals (Andreff 2001).

An investment in sports contributes to the health and well being of people, and is used as a vehicle in the pursuit of the millennium development goals (United Nations 2003). Sports programmes and sport initiatives need to be delivered effectively in order to unlock the potential of sport for wellness and development. There is a need to strengthen community structures, schools, associations and grass root programmes where participation as well as performance is emphasised. Sports programs create opportunities for reaching vulnerable people, and can be an arena for mass communication and awareness programs and can be a platform for sustainable development.

2.2.4 Econometric Analysis

The determinants of sporting success have been investigated in many studies (Kiviaho and Makela 1978; Baimbridge 1998; Condon et al. 1999; Kuper and Sterken 2001; Hoffmann, Ging and Ramasamy 2002; Tcha and Pershin 2003; Bernard and Busse 2004; Johnson and Ayfer 2004; Matros and Namoro 2004). These studies opted for an economic explanation utilising macro-economic variables. This approach was adopted due to the availability of aggregate data and lack of sport specific data in order to complete a trans-national comparison. Most studies utilised a correlation or regression analysis (Kiviaho and Makela 1978; Baimbridge 1998). The researchers utilised Olympic medal counts as a dependent variable representative of Olympic success, and socio-economic variables as independent variables. However there was a consistent lack of accounting for censored data, multicollinearity and heteroskedasticity. Some authors tried to improve on the methodology of the previous studies utilising weighted medal counts, modified regression analysis, and included white corrected errors to account for heteroskedasticity (Condon et al. 1999; Tcha and Pershin 2003; Bernard and Busse 2004). Two macro-economic variables, namely GDP and population, were consistently associated with sporting success. There were fewer consensuses regarding other variables, including: land mass; polity; urbanisation, health and culture.

All of the studies included Olympic medal achievement, or a variant, as a proxy for sporting success. Hoffmann et al,(2002), utilised FIFA rankings and points

allocated, though only included countries that achieved medals at the previous summer Olympics and excluded zero-medal countries to adjust for censored data. Their results were in keeping with the common consensuses. The studies are based on the assumption that there is an equal sporting talent throughout the world, and every nation has an equal opportunity to produce competitive athletes.

According to the models based on GDP and population African countries are predicted to win few, or no medals at all (Bernard and Busse 2004; Johnson and Ayfer 2004). These models are sufficient for predictions in the developed world and for non-medal winning countries, but are poor predictors for medal winning African countries. According to the models, South Africa was predicted to win ten medals, Tunisia five and Kenya two. The actual medal tally depicted South Africa and Tunisia with one medal and Kenya with 14 (Johnson and Ayfer 2004; Hawksworth 2008). The socio-economic variables GDP and population are poor in predicting sporting success for African countries. Theories and models promulgated for developed market economies may not be appropriate for developing economies (Samoilenko 2008). According to Stamm and Lamprecht (2001) as cited by De Bosscher, De Knop, Bottenburg and Shibli (2006), the importance of these variables in explaining international sporting success has decreased over the last two decades, and may only explain 45% of success post -1980. Further research into sporting success is warranted and may include delving further into the systems of sport (De Bosscher et al. 2006).

2.2.5 Proposition One

The following socio-economic endowments of a country are a determinant of sports performance:

- Financial and economic resources
- Demographics including population; climate; and place of birth

2.3. Organisational Determinants

The literature on sports performance focuses on various factors in silo's including, athlete dependent factors, economic resources and the supportive environment as described earlier. However it is important to consider the contribution that sports organisations make towards sports performance and a country's success at sports on an international platform.

Sports performance is influenced by sports organisations, their structure, systems, policies and politics (De Bosscher et al. 2006). In a study by Oakley and Green (2001) , they identified ten items as uniform for sports organisations to attain international success. These factors provide a framework for best practice. The following described by Oakley and Green (2001) include:

1. A clear understanding about the role of different agencies and their effective communication network that maintains the system.
2. Simplicity of administration through common sporting and political boundaries.
3. An effective system for identification and monitoring of talented athletes.
4. Provision of sports services to create an excellent culture.
5. Well structured competitive programs with ongoing international exposure.
6. Well developed and specific facilities for elite athletes.
7. Allocation of resources on a small number of sports, identifying those that have a real chance of success.
8. Comprehensive planning for each sport's needs.
9. Understanding and recognition that developing excellence has costs and requires appropriate funding.
10. Lifestyle support and preparation for life after sport.

De Bosscher et al (2006) further incorporated these ten items with variables identified by Papadimitriou and Taylor (2000), into a multi constituency framework resulting in a nine pillar framework as is evident in figure one. These

nine pillars can be used for a trans-national comparison in order to identify determinants of organisational effectiveness and sporting success.

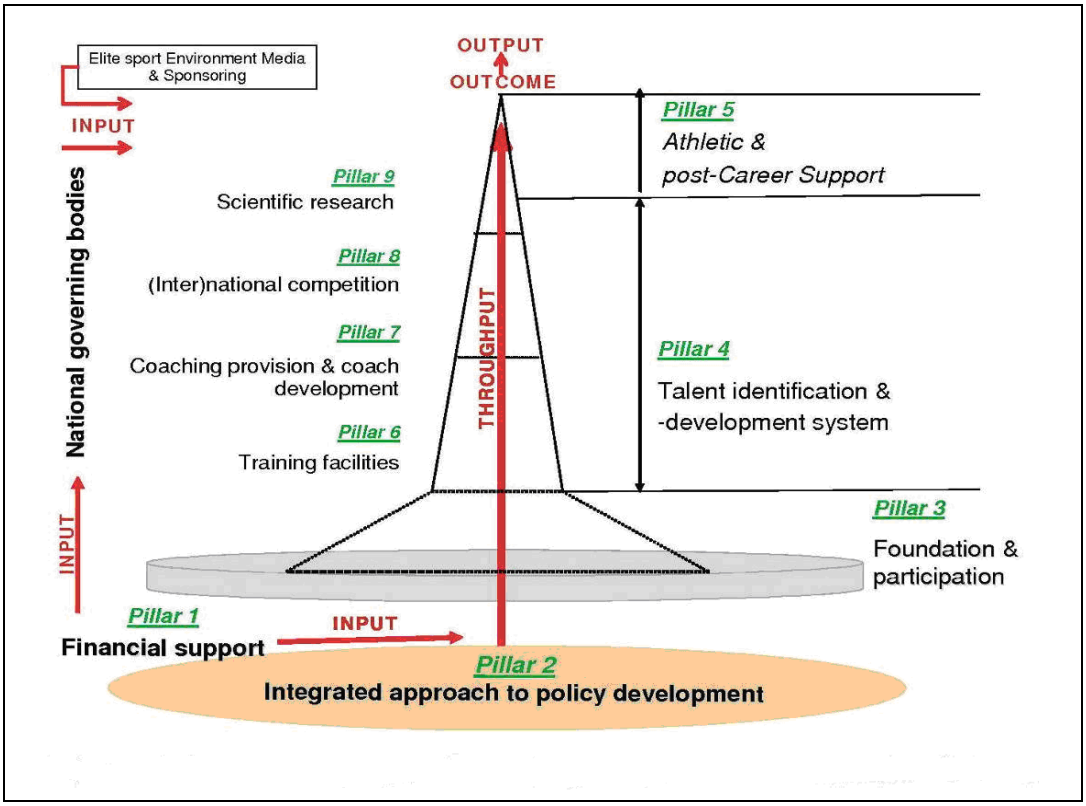

Figure 1 - The nine pillars framework influencing international sporting success

The nine pillar framework illustrated in figure one simplifies and integrates the various components that sports organisations need to consider to ensure success. These include the requirement for sports organisations to consider their function in terms of inputs, throughput and output.

2.3.1 Defining Organisational Effectiveness

Theories of organisational effectiveness have been bound by principles of goal attainment, resource attraction, or the optimisation of internal processes (Papadimitriou and Taylor 2000). The goal attainment model is based on the identification of primary goals and how well the organisation attains them (Parkhouse 2000). An organisation that achieves its goals and outputs may be perceived as successful. Every organisation must accomplish four general goals: secure inputs; secure acceptance and legitimisation for their activity;

acquire necessary skills; and coordinate the activities of its members (Ferkins, Shilbury and McDonald 2005). All four of these goals may not be equally important at any particular time. For this approach to be adopted there must be consensus within the organisation and its members on the goals that are pursued. The application of the goal model is difficult to assess in organisations with multiple goals, or where goals which are vaguely defined, or where goals are not shared by members. Unofficial operative goals may be tied to specific group interest. As a result, the goal attainment approach may not be useful in assessing organisations effectiveness.

The systems resource approach focuses on the inputs of an organisation, specifically on an organisation's ability to attract scarce resources which may include: members; fans and revenue (Gerrard 2005). Public funded organisations often have a guaranteed source of external funds, and the utility of this approach is limited as well. As opposed to utilising the input-output approach, the internal processes approach focussing on throughput may be an indication of effectiveness. This would include communication, development of subordinates and fiscal efficiency. However this approach fails to consider the political nature of organisations.

Organisations stressed by politics and poor administration are associated with poor performance (Gould, Guinan, Greenleaf, Medbury and Peterson 1999). Amis, Slack and Hinings (2002) conclude that members in an organisation need to be aligned with a common purpose, be cooperative and need to hold values that are congruent. There is no clear evidence of how sports policies and polity can influence sporting success. However Hoffmann et al. (2004) suggested from their research that a quest for improved performance may lie in an increasing degree of government influence. They were able to calculate, by means of econometric modelling, that the direct involvement of government in sports may generate an additional 10 medals in competition. It seems that modern sport is inextricably linked to government policy making. Organisations that have established an adequate and sustained working relationship with legislature will have an increased probability of achieving their program objectives (Chalip 1995).

2.3.2 The Structure of Organisations

According to efficiency theorists, organisations that do not adopt the most efficient design, under perform (Roberts and Greenwood 1997). British, Canadian, Australian and French sporting systems were forced into transformation following failure at the Olympic Games (Dine 1998; Green 2004). A review of British sport policy, according to Green (2004), revealed concerns of fragmentation. The structural disorganisation and internal conflict led to sporting failure and the British Sports Administration was forced into an organisational reformation. The emergent proposals were benchmarked against the centralised Australian Institute of Sport (AIS) and their formation of an elite sport programme. The AIS, itself, was formed in 1981, following Australia's poor performance in Olympic sports (Bloomfield 2002).

The structure of an organisation influences the flow of information and the nature of human interactions (Parkhouse 2000). It is a means to collaborate, coordinate and prescribe levels of formality. Three commonly found structures applicable to sports organisations include: complexity; formalisation and centralisation. Complexity refers to the differentiation of the organisation. The organisation is divided into divisions, departments, entities, each with its own tasks and responsibilities. Organisations can further be differentiated horizontally, vertically and spatially. Horizontal differentiation results in different parts of an organisation becoming specialised in different activities, vertical refers to hierarchical levels, and spatial refers to the degree of geographic separation. The increased complexity results in coordination and communication problems. In a review of why organisations fail, Longenecker, Simonetti and Sharkey (1999) quote poor communication as an important reason for failure. Poor bottom-up and top- down communication between members resulted in a failure to understand initiatives and contributed to a lack of focus, vision and direction within the organisation.

In order to manage complexity, organisations incorporate formalisation (Parkhouse 2000). Organisations that are often highly decentralised are also often highly formalised. Formalisation assists in the permeation of shared

values and practices that are pertinent to an organisation's success (Jakobsen, Gammelsater, Floysand and Nese 2005). This includes corporate governance; rules, regulations and procedures which govern an organisation. Governance is pertinent to the effective and efficient management of sports organisation (Ferkins et al. 2005). Formalisation may vary across organisations, and within the various departments it seeks to clarify relationships between members, agents and the board. These processes are especially beneficial when environmental forces such as opportunism; media and public scrutiny; a tightening legal framework and increased stake holders concerns may tend to shape a board's focus (Hannan 1977; Roberts and Greenwood 1997).

Leadership, group cohesion and communication are potential factors critical to organisational success (Gould et al. 1999; Weinberg and McDermott 2002). Effective leadership is consistently discussed as pertinent for success (Weinberg and McDermott 2002). Leaders of sports organisation must exhibit trust, vision, and communication skills and must be able to maintain relationships between the various stakeholders. If an organisation is unsuccessful, the leader usually accepts responsibility. Most leaders accept failure for the following: poor direction; failing to anticipate the needed changes; poor planning and forecasting; political instability within the organisation and an inability to make difficult decisions (Longenecker et al. 1999). According to Perrow (1961), this may only be a reality in organisations where a leader shares in the profits of the organisation.

2.3.3 Organisational Throughput

Nations invest large sums of money in elite sport programmes hoping to achieve international success (Martin, Arin, Palakshappa and Chetty 2005). The availability of organisational support, research institutes, experienced coaches and parental support notably influences the development of the athlete (Cote et al. 2006; Baker and Logan 2007).

Research on skills development supports the relationship between quality training and skill acquisition (Baker, Horton, Robertson-Wilson and Wall 2003) .

According to the “10 year rule”, ten years of high levels of training is a minimum requirement to achieve expert level. For all practical purposes training systems have been unified throughout the world and new systems can be replicated in four years (Bloomfield 2002). The results of new approaches are published in journals worldwide. The curricula for coaching education and certification have been a topic of international comparison worldwide. In addition, International sporting events are closely covered by observers who have helped to contribute to standardised techniques throughout the world.

There are two systems for the development and identification of talented athletes. The first system incorporates a systematic talent identification through a competition structure, and the second selects and identifies individuals with potential for development through scientific testing (Bloomfield 2002; Green 2004). The United Kingdom and Australia have adopted the latter. Funding is targeted at those sports persons classified as talented. This system corrects for the exclusion of potential persons deemed untalented through the relative age effect. The relative age effect is a phenomenon that occurs when children are organized into groups according to their age, and children born earlier in the year have a physiological advantage (Baker et al. 2003). Several countries have now adopted the strategic approach to developing sports talent (International Forum on Elite Sport 2005).

2.3.4 Proposition Two

The following are the organisational dependent factors which affect sports performance:

- Goal achievement
- Resource utilisation : Facilities; salaries; competitions; development
- Effective communication
- Simplicity of administration through sporting and political boundaries
- Trust and Corporate Governance
- Leadership
- Strategy and Comprehensive planning.

2.4. Conclusion of Literature Review

The literature reviewed indicates a wide variety of factors that contribute to performance in sports. It is evident from the body of this literature that understanding sports performance is a complex matter, as there are numerous variables that affect sports performance. Some of the variables are mutually related and cannot be considered in isolation. There are several socio-economic factors that affect sports performance as understood from prior research into the Olympic Games. In addition, there are organisational factors that need to be considered that affect sports performance. There are numerous studies which focus on developed countries and a dearth of research focussing on sports performance for developing countries, particularly African countries.

On the basis of the literature review, this research examines the socio-economic and organisational determinants of sports performance, with an emphasis on the factors that affect African countries. The following propositions serve as a solution to the research problem:

2.4.1 Proposition One

The following socioeconomic endowments of a country are a determinant of sports performance:

- Financial and economic resources
- Demographics including population; climate; and place of birth

2.4.2 Proposition Two

The following are the organisational dependent factors which affect sports performance:

- Goal achievement
- Resource utilisation : facilities; salaries; competitions; development
- Effective communication
- Simplicity of administration through sporting and political boundaries
- Trust and Corporate Governance
- Leadership
- Strategy and Comprehensive planning.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Methodology

In this exploratory research, the methodology includes a sequential two-phased mixed-method approach. The first phase of the research includes the development of an econometric model utilising variables identified in the literature review. The data collected and interpreted together with the literature review forms the basis of the semi-structured interview, i.e. phase two.

The mixed-method approach to this research utilises the benefits gathered from both a qualitative and quantitative perspective to gain further insight into the variables that affect South Africa's sports performance. According to Johnson and Onwuegbuziwe (2004), the mixed-method approach often provides a more workable solution to research and is advocated on a needs-based or contingency approach to concept selection. Phase one of the research facilitates the identification of predictors of an outcome and a quantitative approach was best suited (Creswell 2003). Phase two, using a qualitative approach, required the adoption of a strategy of inquiry in identifying individual experiences and opinions regarding the research variables. The mixed method is advantageous as a quantitative study alone would tend to neglect aspects of the cultural and social environment that affects outcomes (Silverman 1998).

However, this form of research technique is described as being in its infancy, and there are questions regarding the legitimacy of the technique and its application (Johnson and Onwuegbuzie 2004). The combination of the methods are considered to be tenuous due to competing dualisms e.g. objectivists versus subjectivists. Solutions to arguments on legitimacy include the following: utilisation of both viewpoints; consideration of the research as a continuum instead of as different polarities, and following a generic research strategy (Falconer and Mackay 1999; Mingers 2001). A further solution in itself, the mixed-method approach may enhance the validity of findings especially when the results converge or corroborate one another (Greene, Caracelli and Graham 1989). This has been described as triangulation.

3.2 Phase One: Quantitative Research

3.2.1 Research Design

Phase one of the research report deals with the development of three econometric models.

Econometrics is defined as:

That branch of economics which is concerned with the estimation of economic relationships using recognised economic theory and statistical techniques (Kohler 1991). The econometric process presupposes a body of economic theory against which data can be tested. In order to study the empirical relationship between economic variables, the relationship must be expressed in a mathematical form. Once the relationship has been mathematically formulated, the observed data can be correlated with the predicted data. If the theory is compatible with the data it is accepted as valid. If the theory is incompatible, the theory may be rejected or modified in the light of the empirical evidence. The econometric models represent a simplification of reality and include the salient features of the relations of interest and may occasionally exclude unaccounted for influences that are present.

A review of the literature indicates that the preferred method of econometric modelling of sports performance utilised multiple-regression analysis (Kuper and Sterken 2001; Hoffmann et al. 2004; Johnson and Ayfer 2004). Johnson (2004), utilised time series data, and others utilised a cross sectional data for countries participating at the Olympics. This technique included censored data, and data omissions were replaced by mean values. Other researchers utilised a Tobit analysis to compensate for the censored data (Bernard and Busse 2004). Both groups of researchers were able to produce models with adequate predictive abilities.

The models were developed based on theories of Olympic performance. They were poorly representative of and excluded the majority of the non-medal winning countries. Hoffman et al (2002), attempted to utilise FIFA points as a

dependent variable instead of the Olympic medals, to exclude the zero censored data error. The study was limited by the lack of available data. The researchers utilised the techniques developed from previous studies, and replicated the design of the first model. The subsequent models were modified according to the methodology described in this report.

3.2.2 Population and Sample

- ***Population***

The econometric model was developed using a multiple-regression statistical technique, specifying success in sports as dependent on various independent factors. The dependent variables for the three econometric models are extrapolated from three international competitions: the 2008 Beijing Olympic Games; the annual rating of the FIFA World Football Championships; and the 2007 All Africa Games. The population included all participant countries for which there was data available.

The dependent variable represents a proxy for sporting success (Hoffmann et al. 2002). Most studies reviewed in the literature used the medals achieved at the Olympic Games as representative of success; however these were poorly reflective of African countries, most of which did not win any medal at all. Soccer and FIFA rankings are a better representative of international competition as they are more encompassing. The independent variables selected are listed in table two, and are consistent with those from previous research. In addition, this research uniquely models success at the All Africa Games. This competition excludes developed countries and is representative of factors affecting sports participation in an African context.

The data sets include all 203 countries that have a FIFA ranking, or were participants at the Beijing Olympic or All African Games. Countries that do not have consistent data are excluded from the study.

- ***Sample and sampling method***

To avoid bias, countries that have consistent and reliable data are included in the study. The data sets are populated by countries that participated in the various competitions. The data sets are populated by specific independent variables that will be representative of propositions one and two, with consideration for causality and parsimony.

3.2.3 The Research Instrument

- ***Multiple-Regression***

Regression is a statistical tool used to estimate the quantitative effect of the causal variables upon the variable under influence and has been central to the field of economic statistics (econometrics).

The linear relationship between the variables can be represented mathematically as:

$$y= \beta_0 +\beta_1 x_1 +\beta_2 x_2 +\ldots+ \beta_n x_n + \varepsilon$$

The dependent variable is represented by “y”, the independent variables by “x”, the coefficients by “β”, and the error term by “ε”

The following assumptions must be considered when using multiple regression analysis:

- Linearity: Multiple regression models the linear (straight-line) relationship between Y and the X’s.
- Constant Variance: The variance of the ε's is constant for all values of the X’s.
- Special Causes: We assume that all special causes, outliers due to one-time situations, have been removed from the data. If not, they may cause non-constant variance, non-normality, or other problems with the regression model.
- Normality: We assume that the residuals are normally distributed.

- Independence: This assumption can be violated in two ways:
  1. Model misspecification. If an important independent variable is omitted or if an incorrect functional form is used, the residuals may not be independent.
  2. Time-sequenced data. Whenever regression analysis is performed on data taken over time (frequently called time series data), the residuals are often correlated. This research paper utilises cross- sectional data.

- ***A description of the dependent variables selected for the modelling process***

The researcher developed three econometric models based on three international sports competitions to explore the various factors that affect sports performance.

The medals achieved by a country at the Olympic Games and the All Africa Games are representative of a country's success. The medals are weighted according to a point allocation to ensure that a gold medal is more prestigious than silver, and a silver medal is more prestigious than a bronze medal. Three points are allocated for a gold medal, 2 points are allocated for a silver medal, and 1 point is allocated for a bronze medal. The total medals achieved by a country are converted to a weighted medals score. This weighted medal score is utilised as a dependent variable.

The FIFA world soccer ranks countries annually according to a points classification. The points allocations are used as a proxy for international success. This method has been previously utilised by Hoffmann et al (2002). The points are calculated monthly using the performance of a given country's "A"- Team in all international matches, over the previous eight years. Points are awarded on the basis of game results, goals scored, opponents, importance and venues of the matches (FIFA 2009). Previous studies in the literature review utilised the Olympic Games and the medals a country won as a measure of success. This was poorly representative of countries that did not win any medals, in particular countries from Africa. This research will explore the various

components contributing to sports success through an analysis of three competitions, and is inclusive of African countries for which there are available data.

- ***A description of the independent variables selected for the modelling process***

The researcher has selected various independent variables according to the propositions stated in Chapter Two. A summary of the variables are presented in Table Two. A select number of variables have been utilised in previous studies. This study is unique and includes variables that have not been previously modelled. The variables have been selected by the researcher to represent the theory from the literature review in an attempt to explore the factors that may explain sporting success for countries in Africa.

Success in sports is partially explained by factors such as GDP, GDP per capita, population size and health, geography, political and cultural influences.

The independent variables selected for this research include:

- ***GDP, GDP per capita, and population***: data for these variables have been obtained from the United Nations Database (2009).

- ***Latin***: The variable “Latin” represents countries that have a common Luso-Hispanic culture. This variable is a categorical variable and is represented as a dummy variable. Categorical variables are assigned a value of one (1) for all Latin Central and South American countries including Spain and Portugal, and a zero (0) for other countries (Hoffmann et al. 2002).

- ***Infant mortality***: This variable represents a proxy for health service delivery and disease burden within a country. According to Bernard and Busse (2004), healthy citizens have an increased potential to participate in sport. Infant mortality is a numerical variable that represents the number of infant deaths per 1000 live births. The data was acquired from the United Nations Database (2009).

- ***Total Health spend as a percentage of GDP, government spend on health as a percentage of total health spend***: These variables are utilised as proxies to represent the allocation of resources in a country, and are further indicative of a population's health.

- ***Education***: This variable has been calculated utilising data gathered from the United Nations Database (2009). The education variable represents the percentage of the population that is enrolled for formal secondary education. The variable has been selected to represent the allocation of resources in a country towards education, and as a proxy for the level of administration skills of employees.

- ***Unemployment***: This variable has been gathered from the United Nations Database (2009). This variable is utilised as a proxy to represent the availability of potential employees.

- ***Elite***: The variable "Elite" is a categorical variable and denotes countries that had an established High Performance Centre prior to 2005. This variable is represented as a dummy variable, which is assigned a value of one (1) for countries have a High Performance Centre, and a zero (0) for other countries (Martin et al. 2005). The data is gathered from http://www.forumelitesport.org, the International Forum on Elite Sport (2005).

- ***Climate***: Climate information was obtained utilising the Koppen- Geiger climate classification (KGT) and by visual inspection of the KGT climatic world map from http:// www.worldclimate.com . The KGT classification is based on climate zone boundaries which are delineated by vegetation distribution, combined average annual and monthly temperature, and the seasonality of precipitation. Countries are grouped according to Tropical, Dry, Mildmidaltitude (temperate), Continental or Polar climates.

- ***Polity***: Polity is represented by the Gastil index which is indicative of a country's democratic rights and civil liberties. The political rights and civil liberties categories contain numerical ratings between 1 and 7 for each

country or territory, with 1 representing the most free and 7 the least free. The survey measures freedom—the opportunity to act spontaneously in a variety of fields outside the control of the government and other centres of potential domination—according to two broad categories: political rights and civil liberties. Political rights enable people to participate freely in the political process. Civil liberties allow for the freedoms of expression and belief, associational and organizational rights, rule of law, and personal autonomy without interference from the state. The survey does not rate governments or government performance per se, but rather the real-world rights and social freedoms enjoyed by individuals. Each pair of political rights and civil liberties ratings is averaged to determine an overall status of “Free,” “Partly Free,” or “Not Free.” Those whose ratings average 1.0 to 2.5 are considered free, 3.0 to 5.0 partly free, and 5.5 to 7.0 not free. The data will be retrieved from http://www.freedomhouse.org (Gastil Index 2007). Polity is represented as a categorical variable and represented as Free, Partially Free and Not Free.

- ***Corruptions Perception Index***: This variable represents the perception of corruption by multinational firms and institutions as impacting on commercial or social life. It is developed as a public opinion survey that assesses the general public’s perception and experience of corruption around the world. This variable is utilised as a proxy for corporate governance. The data was retrieved from http://www.transparency.org (Transparency International 2007).

- ***Mathematical equation:***

  Success = f (GDP; Pop; GDP/C; Climate; Education %; Health/GDP %; ExpGov/Total Health; Unemployment; Latin; Elite; Polity; CPI; Infant) + ε

Table 2 - A summary of the independent variables selected for the econometric analysis

Variable Name	Variable Abbreviation	Proposition for which the variable is applicable
Gross Domestic Product, 2007, constant 1990 USD	GDP/capita	One
Population	Pop	One
GDP per capita	GDP/capita	One
Total expenditure on health as a percentage of GDP	Health/GDP %	One
Total government expenditure on health a percentage of total health spend	ExpGov/Total Health	One
Percentage of population enrolled for secondary education	Education %	One and two
Percentage of unemployed persons	Unemployment	One and two
Infant mortality per 1000 people	Infant	One
High Performance Centre	Elite	One and Two
Latin	Latin	One
Climate	Temperature (dry, mildmidaltitude, tropical)	One
Polity	Free(polity)	One and two
Corruption perception index, 2007	Corruption	One and Two

Table 2 represents a summary of the variables selected for the econometric models, including the abbreviations that are utilised during the modelling phase. There is an overlap of the variables for proposition one and proposition two, and are maintained due to the exploratory nature of this research. Further information regarding the variables' applicability are explored in phase two of the research.

3.2.4 Procedure for Data Collection

The data are collected from credible sources to ensure reliability and consistency. Table three provides further information regarding the variables and the source of the data:

Table 3 - A summary of the independent variables and their source

Variable Abbreviation	Source of data
GDP/capita	United Nations Database (2009)
Pop	United Nations Database (2009)
GDP/capita	United Nations Database (2009)
Health/GDP %	United Nations Database (2009)
ExpGov/Total Health	United Nations Database (2009)
Education %	United Nations Database (2009)
Unemployment	United Nations Database (2009)
Infant	United Nations Database (2009)
Elite	International Forum on Elite Sport
Latin	Hoffman et al (2002)
Temperature (dry, mildmidaltitude, tropical)	www.worldclimate.com
Free(polity)	Gastil index (2007)
Corruption	Transparency International (2007)

3.2.5 Data Analysis and Interpretation

The data is analysed using NCSS, a statistical software program (Hintze 2008). The analysis employs an Ordinary Least Squares (OLS) technique. The dependent variables representing success in sports are numerical variables. The independent variables consist of both numerical and categorical variables.

3.3 Phase Two: Qualitative Research

3.3.1 Research Design

Phase two of the research report follows a qualitative approach and the intention of utilising this approach is to gain a better understanding of the socio-economic and organisational variables perceived to affect sports success. This aspect of the research design allows the researcher to seek depth and richness by exploring the implications and relations of the significant variables within the context of this study. The sample size is small and selected on a non-random convenience basis. The semi-structured interview seeks to articulate the individual experiences and perceptions of those persons involved in sport.

This phase of the research generates a deeper understanding of the complexities of the contexts explored and the semi- structured, open-ended questions allows the researcher to adapt the interview as further information emerges. Thus unique situations can be explored. However, this phase of the research is complex and the researcher must ensure that he does not influence the interpretation and therefore the findings. The researcher needs to identify and note any bias.

3.3.2 Population and Sample

- ***Population***

The target population considered for phase two includes: sports administrators from various sports organisations; national sports departments; the South African Sports Confederation and Olympic Committee (SASCOC), universities and the media involved in sports broadcasting. A list of the participants has been included in the Appendix A.

- ***Sample and sampling method***

In this particular research it is important to elicit the views of specific persons involved in sport, who have a capacity to answer the questions. It was for this reason that the researcher selected a purposive non-random convenience sampling method to interview 15 respondents (Galpin 2000).

3.3.3 The Research Instrument

In qualitative research, the sources of data are limited by the researcher's open -mindedness and creativity (Leedy and Ormrod 2005). It is important that the data collection is consistent with the design, purpose and focus of the research. This phase of the research, which included interviewing respondents, was conducted personally by the researcher using a semi-structured interview guide. The guide consisted of a series of questions focussing on the respondent's experience, positive and negative, and advice or suggestions. The questions were based on evidence from the literature review and the econometric model. An assumption is made that the respondents are competent to answer the questions in English.

3.3.4 Procedure for Data Collection

The interviews are recorded using a Dictaphone and transcribed verbatim for content analysis.

3.3.5 Data Analysis and Interpretation

The interview was transcribed verbatim and the content further analysed by the researcher (Leedy and Ormrod 2005). The content was analysed for themes, subcategories and sub-themes. The data was summarised and integrated into the research report.

3.4 Limitations of the Study

3.4.1 Methodology

The mixed methodology research technique has been debated in the literature. This research report utilises a sequential method, combining objective and subjective data.

3.4.2 Sampling

- Quantitative research: The variables were selected according to previous studies. Additional variables were included from the review of the literature and the proxies selected were chosen by convenience and availability of data.

- Qualitative research: The sample selection technique, non-random convenience sampling, may limit the generalisation of the results to the population. However the results are useful and can be transferable.

3.4.3 Analysis

- Quantitative research: The research instrument was chosen due to convenience and availability.

- Qualitative research: Thematic analysis and interpretation of the results may include the researcher's own bias.

3.5 Validity and Reliability

3.5.1 External Validity

- Quantitative research: external validity in quantitative research is described as "construct validity". The construct determines the data required and its collection (Golafshani 2003). Further in this regard, the

research is deemed to be valid if the cause and effect relationships are established and are applicable to groups, environments and contexts outside the research settings. To minimise the threat to validity, the researcher selected the variables as described by previous peer-reviewed research articles, and utilised aggregate data sources that are consistent and reliable.

- Qualitative research: external validity is concerned with the ability of the research to be generalised across the population and it is reliant on the use of a truly random and representative sample. However, due to the absence of a sampling frame, it was not possible to use a truly representative sample with little or no bias. The sample used for this study will be convenient in nature. Aspects of the bias have been identified and considered during interpretation.

3.5.2 Internal Validity

One of the most important sources of validity comes from the previous research as discussed in the literature review.

- Quantitative research: internal validity is described as the condition that observed differences on the dependent variable are a direct result of the independent variable, and not some other variable (Johnson and Onwuegbuzie 2006). Previous researchers have established a relationship between socio-economic variables and sports performance and this was used as the starting point for the analysis of this research (Hoffmann et al. 2002; Bernard and Busse 2004; Johnson and Ayfer 2004).

- Qualitative research: The concept of validity is described by a wide range of terms in qualitative research (Golafshani 2003). In a sense, one is advised to rather consider trustworthiness of the research, credibility, consistency, and the interpretation should be representative of the data analysed. In order to establish this research report as credible and

transferable, the researcher must adhere to ethical guidelines and ensure that any bias is accounted for.

3.5.3 Reliability

- Quantitative research: The data utilised for the econometric model was retrieved from a reputable source to ensure consistency, stability and similarity of measurements within a given time period. A high degree of stability and reproducibility indicates a high degree of reliability.

- Qualitative research: in regard to reliability testing of qualitative research one refers to the quality and the trustworthiness of the research (Golafshani 2003). To ensure that the research is reliable it is important for the researcher to remain ethical and to exclude his bias from the interpretation. It is important that the semi- structured interview is not influenced and that the interpretation of the data is representative of the views of the respondents. To prevent the researcher's bias from affecting the analysis, it was included in the limitations of the research to alert the reader and lend credibility for the report.

CHAPTER 4: PRESENTATION AND DISCUSSION OF THE RESULTS

4.1 Introduction

This chapter presents the results of the research conducted in two phases and includes a discussion of the respective findings.

Phase one of the research includes the formulation of three econometric specifications developed from an analysis of a country's sports performance at international competitions namely: the 2008 Beijing Olympics; the FIFA World Championships, and the 2007 All Africa Games. The first two models utilise the data from the Olympic Games and FIFA rankings, and each model is developed utilising the theory base from prior literature. The specification of these models was compared to the findings from other studies, to ensure the consistency and reliability for this study. The third model, based on the All Africa Games, was designed to specifically exclude the effects of developed countries on sports performance, and factors that affect sports performance of African countries.

In the early parts of this chapter, the econometric models are presented with an explanation to facilitate an understanding of the procedure of model development and selection. The specification of the three models is discussed in relation to sports performance and the relevant findings are extrapolated for further critique in phase two of this research. The findings from phase one of the research processes are utilised in phase two to assess the relevance of the findings in a South African context. Phase two of the research includes semi-structured interviews conducted through convenience sampling across a variety of sports federations, government and other stakeholders involved in South African sports.

4.2 Phase One

4.2.1 A Presentation of the Econometric Models

Three econometric models were designed utilizing the NCSS multiple regression analysis software (Hintze 2008). This statistical analysis was utilised to explain the nature of each of the dependent variables extrapolated from the prior literature on the subject as discussed in chapter two. The five percent level of statistical significance, (α=5%), was selected to determine the significant independent variables.

This study attempts to identify the significant independent variables that affect sports performance and is exploratory in nature. Several studies have reported variables that impact on sports performance, specifically at the Olympic Games (Kiviaho and Makela 1978; Bernard and Busse 2004; Johnson and Ayfer 2004). The researcher has developed models A and B, in an attempt to replicate the models from previous literature. In addition, model C was created, consistent with the methodology of models A and B, to elicit the significance of specific variables which affects the sports performance of African countries. The intention of the researcher, through the development of the three varying models, is to explore the various socio-economic and organisational factors which affect sports performance; and in particular to identify specific factors that are relevant to African countries.

The various quantitative models for phase one of the research was developed using data obtained for the specific variables detailed in Table 2.

The three models labelled A; B; and C are representative of the Olympic Games; FIFA World Championship Football Rankings and the All Africa Games respectively (Table 3).

The data sets for models A and B are identical in all respects and only vary in the selected dependent variable. The data set for Models A and B include all countries that are participants at the event and for which there was available data. The data set for model C includes countries from Africa only, and for

which there is available data. The dependent variables for Model A and C represent the total medals achieved by a country at a competition, and have been modified with a weighted points allocation system, awarding three points for a gold medal, two for a silver medal and one for a bronze medal. The weights adjust for the hierarchy and prestige of winning a particular medal.

Table 4 - A representation of data utilised for the development of the econometric models

	Description of Model	Dependent variable	Independent Variables
Model A	A sample of 78 countries Beijing Olympics, 2008	weighted Olympic Medals 3 points for a gold 2 points for a silver 1 point for a bronze	GDP/capita Education % Unemployment Health/GDP % ExpGov/Total Health Elite Sports Program Corruption Population Free(polity) Latin language Temperature (dry,mildaltitude,tropical)
Model B	A sample of 78 countries FIFA 2008	Points at year end	
Model C	A sample of 29 countries Algeria All Africa Games, 2007	weighted All Africa Medals 3 points for a gold 2 points for a silver 1 point for a bronze	GDP/cap Education % Unemployment- **insufficient data** Health/GDP % ExpGov/Total Health Elite Sports Program- **insufficient data** Corruption Population Free(polity) Latin language- **insufficient data** Temperature (dry,mildaltitude,tropical)

A description of model A

Model A is a representation of an econometric model quantifying the relationship between a country's success at the Beijing Olympic Games, as measured by a cumulative weighted medal score (wtdOlympic), and the selected socio-economic and organisational dependent variables (Table 3). In a review of prior literature, several variables were identified as significant and affecting sports performance. These were selected for the following linear specification:

$y= \beta_0 +\beta_1 x_1 +\beta_2 x_2 +\ldots+ \beta_n x_n + \varepsilon$

The researcher is going to test the following relationship:

$\text{WtdOlympic} = \beta_0 + \beta_1 \text{GDP} + \beta_2 \text{Population} + \beta_3 \text{GDP/cap} + \beta_4 \text{Climate} + \beta_5 \text{Education} + \beta_6 \text{Health/GDP \%} + \beta_7 \text{ExpGov/Total Health} + \beta_8 \text{Unemployment} + \beta_9 \text{Latin} + \beta_{10} \text{Elite} + \beta_{11} \text{Free} + \beta_{12} \text{Corruption TI} + \beta_{13} \text{Infant} + \varepsilon$

The dependent variable *wtdOlympic* represents the weighted medal score for a country (3 points for a gold medal, 2 for silver, and 1 for bronze). The independent variables in the equation have been described in table 2 and are representative of socioeconomic and organisational determinants of sports performance.

The econometric specification derived utilising an alpha of five percent (α= 5 %) is detailed in table 4, and presented as:

$\text{WtdOlympic} = 11.07 + (-26.24)\ \text{Corruption} + (+1936.90)\ \text{Education} + (64.07)\ \text{Elite} + (0.0025)\ \text{GDP/cap} + (-0.013)\ \text{Unemployment} + (6.61)\ \text{Health/GDP \%} + \varepsilon$

In the model selection process, numerous issues which replicated and contrasted with previous studies on Olympic success were observed. In contrast to previous studies we found that the size of a country's *population*; *climate*; *latin*; and *GDP* as independent variables does not have a significant impact on the performance at the Olympics at an alpha level of 5% (Hoffmann et al. 2002; Bernard and Busse 2004; Johnson and Ayfer 2004). In addition, two

variables namely *ExpGov/Total Health* and *polity (free)* were statistically insignificant at the 5% level.

In concordance with the literature, *GDP per capita* and *Elite* were identified as statistically significant and positively correlated. The positive coefficient for GDP/capita suggests that higher levels of income lead to a better performance in sport. GDP per capita indicates that performance in sports is a luxury good.

In addition, several variables selected by the researcher were also found to be significant. These include *corruption*; *education*; *unemployment*; and *health / GDP %*. The model depicts a positive relationship between performance and *education*; and performance and *health / GDP %,* as indicated by the sign of the coefficient. And, the model depicts an inverse relationship between *Corruption* and *unemployment* in regard to performance at the Olympic Games.

Table 5 - A representation of the multiple regression results for model A

Regression Equation: Olympic Games					
Independent Variable	**Regression Coefficient**	**Standard Error**	**T-Value to test H0:B(i)=0**	**Probability Level**	**Reject H0 at 5%?**
Intercept	11.0775	38.4532	0.288	0.7743	No
Corruption_	-26.2386	8.0898	-3.243	0.0019	Yes
(Dry_b_=1)	-5.144	28.4601	-0.181	0.8572	No
Education	1936.9001	610.1718	3.174	0.0024	Yes
(elite=1)	64.0722	21.0074	3.05	0.0034	Yes
(free=1)	12.753	20.935	0.609	0.5447	No
GDP_cap	0.0025	0.0012	2.011	0.0488	Yes
(latin=1)	-41.6127	24.6888	-1.685	0.0971	No
(Mildmidlatitude_c_=1)					
	13.5002	20.8444	0.648	0.5197	No
population	0	0	0	1	No
(Tropical_a_=1)	6.9101	31.5923	0.219	0.8276	No
unemployment					
	-0.0127	0.0027	-4.714	0	Yes
ExpGov/Total Health					
	-0.5697	0.5602	-1.017	0.3133	No
Health/GDP %	6.6135	2.898	2.282	0.026	Yes
R^2=0.7056					
adjusted R^2=0.6418					

The inverse relationship between *corruption* and performance required further investigation. The *corruption* variable is an index representative of the perception of corruption in a country. The index ranges from zero to ten, with ten indicating the lowest perception of a corrupt country, and zero indicating the highest perception of a corrupt country. The model thus indicates that countries that perform better at the Olympics, by virtue of the weighted points score, are perceived as more corrupt by the Transparency International survey. This relationship is unpacked in section 4.2.2 of this report. The relationship between the *corruption* variable and *GDP per capita* was further investigated in the following ways, for purposes of accuracy. Firstly, by including an interaction term *GDP/capita* multiplied by the *Corruption Index*. The addition of the interaction term had no effect on the relationship. Secondly, the model was stressed by the further inclusion of a transformed variable, i.e. the square of the corruption index. The relationship remained static. And finally, the data set was investigated for any outliers that would affect the model, i.e. by a graphical plot of *corruption* versus *GDP/capita* (figure 2). The model remained static.

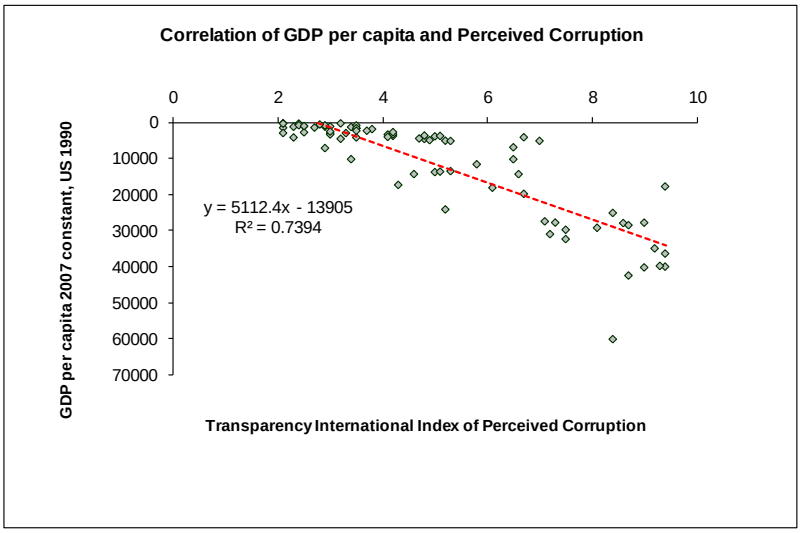

Figure 2 - **A graphical representation of GDP per capita versus the index of perceived corruption**

The econometric model that was selected as represented in table 4, includes six independent variables as significant and account for 64% of the variance in a countries individual success (R^2= 70.56 % and adjusted R^2= 64.18%).

A Description of model B

In a review of the literature, sports performance is modelled utilising the Olympic Games. In only one other study, a model was specified utilising an alternative proxy for success in sports (Hoffmann et al. 2002). Hoffman et al (2002), utilised FIFA point's allocation as a proxy of sports performance, but restricted their study to a subset of countries that competed successfully at the Olympics. The study excluded countries that are successful in football, but are conversely weak performers at the Olympics. In this study the researcher selected as many countries as possible that had available data.

Model B is a representation of an econometric model quantifying the relationship between a country's successes in football, as measured by the year ending FIFA cumulative point's allocation, (FIFApoints), and selected socio-economic and organisational dependent variables (Table 3). In a review of prior literature, several variables were identified as significant and affecting performance in football. These were selected for the following linear specification: $y= \beta_0 +\beta_1 x_1 +\beta_2 x_2 +\ldots+ \beta_n x_n + \varepsilon$

The following relationship was evaluated:

$$FIFApoints = \beta_0 + \beta_1 GDP + \beta_2 Population + \beta_3 GDP/cap + \beta_4 Climate + \beta_5 Education + \beta_6 Health/GDP\% + \beta_7 ExpGov/Total\ Health + \beta_8 Unemployment + \beta_9 Latin + \beta_{10} Elite + \beta_{11} Free + \beta_{12} Corruption + \beta_{13} Infant + \varepsilon$$

The dependent variable FIFApoints represents success in football. The independent variables in the equation have been described in Table 2 and are representative of socioeconomic and organisational determinants of sports (football) performance. The econometric specification derived utilising an alpha of five percent (α= 5 %) is detailed in table 5 and is presented as:

FIFApoints = 202.66 + (+324.41) Latin + (+228.74) Mildmidaltitude + (344.24) Tropical + ε

In the model selection process for the dependent variable FIFApoints, the researcher replicated the methodology for the modelling process of model A. This was a replication of the study conducted by Hoffman(2004). In contrast to Hoffmann (2004), only three of the independent variables selected were statistically significant at 5% (Table 5). And, two of the variables: *tropical* and *Mildmidaltitude* refers to the effect of climate on sports performance. *Latin* was significant as an individual independent variable. In Hoffman (2004) Latin was only significant when combined with population as an interaction term.

Table 6 - A representation of the multiple regression results for model B

Regression Equation: FIFA Points					
	Regression	**Standard**	**T-Value**		**Reject**
Independent	**Coefficient**	**Error**	**to test**	**Probability**	**H0 at**
Variable			**H0:B(i)=0**	**Level**	**5%?**
Intercept	202.6629	153.0571	1.324	0.1905	No
Corruption_	-59.5955	32.2	-1.851	0.0691	No
(Dry_b_=1)	-33.1566	113.2809	-0.293	0.7708	No
Education_	4094.6669	2428.6935	1.686	0.097	No
(elite=1)	112.4987	83.6169	1.345	0.1836	No
(free=1)	23.0173	83.3284	0.276	0.7833	No
GDP_cap	0.0067	0.005	1.344	0.1841	No
(latin=1)	324.409	98.2697	3.301	0.0016	Yes
(Mildmidlatitude_c_=1)					
	228.7441	82.9679	2.757	0.0077	Yes
population	0	0	0	1	No
(Tropical_a_=1)	-344.2397	125.7481	-2.738	0.0081	Yes
unemployment					
	0.0174	0.0107	1.62	0.1104	No
ExpGov/Total Health					
	3.2208	2.2298	1.444	0.1538	No
Health/GDP%	10.891	11.535	0.944	0.3489	No
R^2=0.5772					
adjusted R^2=0.4856					

According to the selected model, the researcher found that the size of a country's *population; GDP; GDP/capita; polity (free); education; and unemployment*, as independent variables does not have a significant impact on football performance (alpha 5 %). Both *corruption and education* are statistically significant at the 10 % alpha limit. The inverse relationship between *corruption*

and performance remained consistent with the findings of model A. Of the three independent variables that were selected as significant, they accounted for 49% of the variance in a countries individual success in football (R^2= 57.72% and adjusted R^2= 48.56%).

A Description of model C

In a review of the literature, sports performance is modelled utilising the Olympic Games. In only one other study, a model was specified utilising an alternative proxy for success in sports (Hoffmann et al. 2002).Hoffman et al (2002), utilised FIFA point's allocation, but restricted their study to a subset of countries that competed successfully at the Olympics.

The model specification described in the literature discounts the effects of specific factors which affect sports performance for African countries. Most developing countries perform poorly at the Olympics. As a result, subsequent models developed for sports performance specified for the Olympics poorly differentiates for African countries. This study accommodates for African countries by modelling sports performance at the All Africa Games.

Model C is a representation of an econometric model quantifying the relationship between a country's success at the All Africa Games, as measured by a cumulative weighted medal score (wtdAfrica), and the selected socio-economic and organisational dependent variables (Table 3). In a review of prior literature, several variables were identified as significant and affecting sports performance. Three variables: *Unemployment*; *Latin*; and *Elite* have been excluded in the specification in model C due to the lack of available data. The following formulation represents the linear specification:

$$y= \beta_0 +\beta_1 x_1 +\beta_2 x_2+\ldots+ \beta_n x_n + \varepsilon$$

The following relationship was evaluated:

$$\text{WtdAfrica} = \beta_0 + \beta_1 \text{ GDP} + \beta_2 \text{ Population} + \beta_3 \text{ GDP/cap} + \beta_4 \text{ Climate} + \beta_5 \text{ Education} + \beta_6 \text{ Health/GDP \%} + \beta_7 \text{ ExpGov/Total Health} + \beta_8 \text{ Free} + \beta_9 \text{ Corruption} + \beta_{10} \text{ Infant} + \varepsilon$$

The dependent variable *wtdAfrica* represents the weighted medal score for a country (3 points for a gold medal, 2 for silver, and 1 for bronze). The independent variables in the equation have been described in Table 2 and are representative of socioeconomic and organisational determinants of sports performance. The econometric specification derived utilising an alpha of five percent (α= 5 %) is detailed in table 6 and presented as follows as:

WtdAfrica = -42.12 + (-33.05) Corruption + (+13244.04) Education + (-56.97) Mildmidaltitude + ε

Table 7 - A representation of the multiple regression results for model C

Regression Equation: All Africa Games					
Independent Variable	**Regression Coefficient**	**Standard Error**	**T-Value to test H0:B(i)=0**	**Probability Level**	**Reject H0 at 5%?**
Intercept	-6.9184	32.2272	-0.215	0.8322	No
Corruption TI	-33.0508	9.8459	-3.357	0.0031	Yes
Education %	11862.5589	1680.7329	7.058	0	Yes
GDP	0	0	0	1	No
(Mildmidlatitude_c_=1)	-55.6213	20.0873	-2.769	0.0118	Yes
population	0	0	0	1	No
ExpGov/Total Health	0.9114	0.549	1.66	0.1125	No
Health/GDP%	1.5828	2.591	0.611	0.5481	No
R2=0.9311					
adjusted R2=0.9070					

In the model selection process for the dependent variable *wtdAfrica,* the researcher replicated the methodology for the modelling process of model A and model B for consistency. In contrast to the literature review, the researcher could not find any published studies that modelled the performance of athletes at the All Africa Games, or similar intercontinental competition.

In this model, only three of the independent variables selected were statistically significant at 5%. These include *Corruption, Education and Mildmidaltitude*. There is consistency in the inverse relationship *between Corruption* and sports performance, and there is a positive relationship between contributions of *Education* on sports performance at the All Africa Games. Contrary to the

findings in model B, *Mildmidaltitude*, as a climate variable is inversely related to performance.

According to the selected model, the researcher found that the *size of a country's population; GDP/capita; GDP; polity; and unemployment; as independent variables* does not have a significant impact on performance (alpha 5 %). The three independent variables that were selected as significant, accounted for 90.70% of the variance in a countries individual success at the All Africa games (R^2= 93.11% and adjusted R^2= 90.70%).

4.2.2 A Discussion of the variables pertaining to proposition one and proposition two in Phase One

The significant variables identified from the three econometric models, A B, and C, have been tabulated below with their respective coefficient signs (Table 7). The coefficient signs, listed as positive or negative, represent the relationship of the independent variable to the dependent variable. There is a consistent relationship, either positive or negative (inverse), for all variables except for Mildmidaltitude. This relationship is varied and is dependent on the specifics of the dependent variable (Table 5 and Table 6).

Table 8 - A representation of the significant socio-economic and organisation variables which affects sports performance

Proposition	Significant variables identified	Coefficient Sign
Proposition One	GDP/capita	positive
	Unemployment	negative
	Health/GDP %	positive
	Education %	positive
	Latin language	positive
	Temperature (Mildmidaltitude)	positive/negative
	Temperature (tropical)	negative
	Elite Sports Program	positive
	Corruption	negative
Proposition Two	Education %	positive
	Unemployment	negative
	Elite Sports Program	positive
	Corruption TI	negative

Socio-economic factors as a determinant of sporting success

In previous studies the authors described success at the Olympic Games as dependent on GDP, GDP per capita, population, culture, climate and polity. The econometric model for the 2008 Beijing Olympic, developed in this study based on prior literature, confirms the findings from previous research (Table 4). In addition, several other variables specific for this study as extrapolated from the literature review, are also significant and contribute to sports performance.

An interesting and unique finding in this study compared to previous studies includes the association of the variables *GDP/capita*; *Health/GDP %*; *Elite,* and *Education* as contributors of sports performance at the Olympics (Model A). This finding is consistent with the assumptions from previous studies. According to one such study, it is assumed that an increased availability of resources will result in a better education, an improved health status, and an increased potential for sports participation (Bernard and Busse 2004). It was further assumed that countries that have access to greater economic resources will have the potential to provide better training facilities for their athletes. This study was successful in proposing a model that confirmed the assumptions from previous studies (Bernard and Busse 2004; Johnson and Ayfer 2004; Tcha 2004). The association of these variables suggests that success at the Olympics is not only dependent on the allocation of financial resources specifically to sports but also to other social sectors (education, health, and employment).

This finding may explain South Africa's performance at the Beijing Olympics. South Africa has a relatively higher GDP per capita compared to other African countries. However, in comparison, South Africa disproportionately allocates resources to *Education* and *Health/GDP%.*

According to Tcha and Pershin (2003), the authors described higher income countries' success at the Olympic Games as being reflective of a Revealed Comparative Advantage (RCA). This study adds further evidence to the RCA theory proposed by Tcha and Pershin (2003) by explaining the association between a high income and sports performance. In addition to a higher income,

a country needs to allocate its resources appropriately to realise its comparative advantage. The theory of RCA is incomplete without describing that the required allocation may be incompletely specified without alluding to allocative and technical efficiency. A modified perspective suggests that countries that have preponderance for a higher GDP per capita, and that are able to allocate and utilise the funds efficiently will have an increased probability of success in sports. This may be a more feasible explanation in describing the success of Great Britain and Australia in sports. In as much as there is an abundance of financial input by the governments of both Australia and Great Britain, both sports systems were forced into transformation to ensure that the financial inputs were appropriately utilised to maximise the output (Green and Oakley 2001).

The researcher was unable to replicate the specification for the FIFA World Championship and the 2007 All Africa games. This suggests that the factors that contribute to sports performance are heterogeneous and vary according to the following: the type of competition; the participants, and the selected variables. The researcher anticipated that GDP per capita would also be a significant variable in model C. The absence of this variable in model B and model C suggest that success at the All Africa Games and FIFA is not dependent on financial resources.

The specification for model A, B, and C is unique, which suggests that different variables contribute to success in different sports. Previous studies considered the variables that influenced sports performance by focussing only on the Olympic Games. As a result, they failed to appreciate the relationship of the variables in regard to different sports. The Olympic Games and the All Africa Games is a composite competition, which aggregates the success of a country in various sports. The FIFA World championship in contrast, represents a single sport.

In contrast to the previous studies, this study failed to identify the specific effect of a population's size as a significant variable. This is a logical finding as India, with over a billion people, performs poorly at certain sports and better at others.

The relationship of population and sports performance is an indirect relationship and is inferred by the GDP per capita variable. The researcher has previously demonstrated that countries with a higher GDP per capita have an advantage over success at the Olympic Games. For a given GDP, a country with a higher population will be disadvantaged. Similar to the study by Hoffmann et al (2002), countries that have preponderance for a derivative *Latin* language perform better than non Latin speaking countries at the FIFA World championships.

In agreement with previous studies, climate represented by the Koppen classification, is a significant variable which contributes to sports performance. It is interesting to observe that the effect of *Mildmidaltitude* or a temperate climate is advantageous for success in the FIFA model, but is disadvantageous for countries competing at the All Africa Games.

A comparison of the three models reveals two marginally consistent significant variables that relates to sports performance (Corruption and Education). The variables *Corruption* and *Education* are significant in model A and C with an alpha of five percent and are only significant in model B if you allow for an alpha level of ten percent. The significance of the *Education* variable and the relationship to sports performance can be appreciated because children at school have an increased probability of being exposed to sports and sports programmes. This is plausible as education facilities in primary, secondary and tertiary education systems are known to have sports programmes. An investment in education also produces knowledgeable citizens, managers, health professionals, sports technical staff, and administrators. The educated and skilled may contribute to a country's pool of knowledge and sports expertise (information asymmetry) and hence, may result in a competitive advantage.

According to the models, countries that have performed well in sports are perceived to be more corrupt than those countries that have not (the corruption index ranges from 0-10, with 10 being the least corrupt country). This finding is in conflict with the earlier discussion on sports performance. It has already been suggested that success in sports in directly related to GDP per capita (model A). And, the author has graphically illustrated that GDP per capita is inversely

related to corruption (figure 2). By inference, one is likely to expect that sports performance is inversely related to corruption in a country.

Corruption, according to Khan (1996), is usually defined in most social science discussions as a deviation from legal norms which are objectively observable, without actually questioning the morality or legitimacy of the legal norms themselves. This definition is problematic because legal norms vary over time and across countries. A more useful definition of corruption would include defining corruption as behaviour which deviates from the formal rules of conduct governing the actions of someone in a position of public authority because of private-regarding motives such as wealth, power or status (Khan 1996). There is a perception that corruption is limited to unsuccessful countries. According to Ades and Di Tella (1996), corruption is not limited to unsuccessful countries only. Corruption is said to be firstly, higher in countries where economies are dominated by a small number of firms; secondly, higher in countries where the judicial institutions are not well developed or not independent of political influence and thirdly, where policy conclusions are protectionist or directed by restricting the competitive pressure. Bureaucrats in virtually every country that have the power to allocate rights over scarce resources, are at risk from being corrupt (Khan 1996).

This risk extends to policies aimed at selective redistributive measures, especially when it occurs against a background of general impoverishment. The selective allocation of funds in South Korea raises interesting questions about the relationship between corruption and economic change (Kong 1996). It can be argued that the longstanding and official corruption (selective distribution) in the Korean society, in the form of subsidised credit to business, actually promoted economic growth. This argument ignores the hidden costs of the selective distributive measures. Businesses in South Korea were selectively allocated resources to continue at the expense of businesses that were failing.

The logic can be applied to sports and the selective allocation of resources to elite athletes. Alternatively, the significance and consistent findings of the

Corruption variable in regard to sports performance may be rationalised by considering the following:

Corruption may be indicative of a country's policies towards sports performance and the selective allocation of funds.

Corruption may be indicative of imperfect competition between countries through information asymmetry and technical knowledge.

Corruption could be perceived as the rent seeking behaviour of athletes. For the economist, the "rents" refers to the "excess income" which is a description of the excess earnings of sports persons.

Corruption may be indicative of athlete behaviour and the use of illegal substances.

An alternative view of corruption may be a consideration that in countries perceived as corrupt, corruption restricts opportunities to individuals in certain sectors. Sports may provide a successful athlete with an opportunity to *leap-frog* the restrictive paradigm. People from developing countries may find it harder to succeed in other ways and sports allow one to *leap-frog* out of the country and socio-economic predicament and migrate to wealthier countries. This view is contrary to Andreff (2001). The author criticises the sale and migration of elite athletes from the developing country to the developed. According to Andreff (2001), the migrations of skilled capital from the developing world further contribute to the country's deprivation.

Organisational Determinants of Sporting Success

This study is unique because it attempts to model the organisational determinants that affect sports performance in addition to the socio-economic variables. This has not been attempted in prior studies. A weakness of the econometric models includes mis-specification and the selection of appropriate variables that may be sufficiently representative of the organisational determinants of sporting success. The researcher recognised this inherent

weakness and augmented the modelling process with content obtained from the semi-structured interviews.

In an analysis of the specification for models A and C, *Education* and *Corruption* is significant at the five percent level, and further significant at the ten percent alpha level for model B. The *Education* variable, is representative of the level of education in a country, and indirectly represents the level of skilled managerial expertise with a formal education. The coefficient is positive, which indicates that a country's sports organisations that have skilled employees and appropriate managerial expertise will have an increased probability of success in sports. Organisations that are able to attract and acquire the necessary skills will have an increased probability of achieving their goals, function effectively and administrate efficiently. Sports organisations require skilled staff in order to recognise talented athletes, develop and nurture the talented, and appropriately allocate the scarce resources in order to compete successfully (Ferkins et al. 2005).

The *Corruption* variable was selected as a proxy to indicate governance and transparency. It was anticipated from prior literature that trust and good corporate governance are critical for the success of an organisation in achieving its objectives (Amis et al. 2002). The *Corruption* variable cannot be explained in this regard and will be further described with information extrapolated from the interviews.

Countries that have a comparative advantage and higher GDP per capita may be privileged and more capable of investing in luxury goods, for example, *Elite* sports performance centres, private specialised *education*, as well as a low level of *unemployment.* Employed parents can afford to volunteer their services for free to sports organisations and independently finance the development of their children's sporting interest.

According to the literature review, politics may affect sports performance by impacting on organisations, contributing to financial resources and by regulating and prioritising sports programmes. The variable *free,* indicative of polity, was insignificant in all three models. This is in contrast to previous econometric

models which suggested that a country's sports performance is affected by the state of polity. The researcher will investigate the relationship between polity and sports performance further in phase two of the research. The relationship between politics and the influence of the government on a country's sports performance may be complex and indirectly defined.

The specification for the three models is inconsistent, as described in relation to the variables from proposition one. This inconsistency is maintained in proposition two. In model C, an exclusive description of factors which affect sports performance in African countries, the *Education* variable is positive and dominant. South Africa has a higher value for *Education* and has a comparative advantage compared to other African countries at the All Africa Games. This advantage is lost at the Olympic Games and in the FIFA rankings.

4.2.3 Conclusion of Phase One

The econometric specification from phase one of this research suggests that there are several socio-economic and organisational variables that affect sports performance. The final specification is a composite of the significant variables, the intercept and the standard error term. The discussion and rationalisation of the specification is dependent on the literature review and the interpretation of the researcher. This may result in an erroneous deduction. Phase two of this research will be used to gather further information on the relevance of the findings from phase one. In addition, the comments from the interviewees will contextualise the significant variables as well as the relevance and application, specifically in a South African context.

4.3 Phase Two

4.3.1 Introduction

Phase two of this research project includes semi-structured interviews of 15 respondents that are familiar with the determinants of sporting success and performance on an international platform. This phase of the research adds further comment to the variables identified in phase one of the research. There are numerous international studies that have focussed exclusively either on the socioeconomic determinants, organisational determinants or on athlete dependent factors which affect sports performance. There are relatively few studies that have considered an aggregated approach in assessing the factors that relate to sports performance. To date, there are no studies that model the socio-economic and organisational determinants of sports. And, the studies that have modelled performance at sports have looked exclusively at sports performance at the Olympic Games.

4.3.2 A Discussion of the variables pertaining to proposition one and proposition two in Phase Two

Socio-economic factors as a determinant of sporting success

There is a general consensus that financial resources are an essential requirement for success in sports. The financial resources that are required are utilised to purchase equipment (sports and administrative); pay salaries (coaches, administrative, support staff), pay for travel and accommodation (competitions, other); and for the development of elite athletes. The interviewees highlighted numerous issues regarding the acquisition, allocation, utilisation and dependence on the financial support they received. It is accepted amongst the interviewees that finances are limited in South Africa, and as a result the allocation of the resources needs to be considered according to merit, especially for the investment in sports. One interviewee stated that: “South Africa needs to have an integrated framework to allocate funds to improve sports, and needs to identify specific economic drivers e.g. economic

opportunities; build infrastructure; invest in school sports; and increase mass participation".

Two respondents indicated that South Africa and other countries in Africa cannot afford to invest in sports performance preferentially, and that these countries should rather allocate funds to health, poverty alleviation, education, and infrastructural developments. Interestingly, the models described in phase one suggests that a preferential investment into the social infrastructure of a community will actually increase the probability of an increased performance in sports.

Several of the interviewees indicated an awareness of the strategic intent of SASCOC to allocate funds to a selected group of sporting codes that have a higher probability of success at the Olympics. This was viewed by many respondents as inappropriate. According to an interviewee, "the allocation of funds is already haphazard and we need to decide whether we are targeting high performance, development or mass participation". Two of the interviewees questioned the allocation of funds to cricket and rugby, and remarked that these sports are able to generate sufficient resources of their own. Three of the interviewees expressed that the resources that are available should be targeted at certain sports only as there are too many sporting codes. One respondent indicated that one's strategy should include targeted funding; and resources must be focussed on popular sports and not Cinderella events.

Of the fifteen respondents interviewed, three respondents commented that even though financial resources are essential, they are not critical to achieve success. They described athletes from Kenya, who even though they are poor, are successful due to their genetic attributes and the altitude at which they train. According to another interviewee, there are athletes in the Northern Cape and Lesotho that have a similar body structure to the Kenyans, and should have an equal potential to succeed, but have not yet done so. One respondent is quoted as saying that "some athletes don't have the fire in their bellies, and no amount of resources will make them successful".

The Organisational Determinants of Sporting Success

Sports organisations require structure, skilled employees, leadership, and financial resources in order to function effectively. There is a general consensus that sports organisations in South Africa were unable to accomplish their goals due to a lack of financial resources and skilled human capital. Five of the interviewees explained that the difficulties their organisations experienced were due to a lack of cash flow which prevented the organisational from functioning adequately. They described an inability to pay salaries and other administrative costs. One interviewee described having to finance the sports organisation and the overheads of the administration from a private account. Another described an inability to confirm an athlete's participation at an international championship due to a lack of finances. Several interviewees commented that as a result of financial constraints, the organisation was dependent on volunteers and included that their members on the executive board were also volunteers.

The interviewees described a common model for fund acquisition. The interviewees agreed that most often, the financial resources are acquired from either the national lottery, the government or through private corporate sponsorship. The interviewees expressed that the national and provincial government structures and the national lottery are responsible for the financing of sports in South Africa. Interviewee fourteen expressed that this funding model has been utilised successfully by the United States of America (USA), Australia and Great Britain in their preparation for the Olympics.

Goal setting and Strategy Formulation

All of the interviewees expressed an understanding of setting goals for their organisation. A few respondents described that their organisational goals were aimed at achieving medals at the Olympics. Others described targeting resources as a continuous goal. Several interviewers included aspects of transformation in sports, athlete development, and increased participation as additional goals. A few of the interviewees described that they were unable to achieve their goals, due to financial constraints, and due to the unrealistic nature of the goals that had been set. According to the interviewees, certain

goals were set specifically to comply with the requirements of the funding and sponsorship agreements and requirements set by SASCOC.

According to an interviewee, SASCOC's strategy for success at the next Olympics is an attempt to play catch up with Australia and Britain. Four of the interviewees questioned the time frame for the strategy, and noted that winning 12 medals by 2012 is unrealistic. According to interviewee eight, "it takes 10 to 12 years to prepare athletes, and this requires focussing on specific individuals, rather than entire teams". Interviewee ten explained that South Africa cannot afford to participate at all sports at the Olympics. The interviewee further added that in 1996, Mozambique took only four athletes to the Olympics and returned with one medal. This equates to a 25% success rate.

One respondent commented that in order to develop world class competitors, one requires world class coaching. One interviewee added that South African coaches are "uni-dimensional" and rely too much on additional assistance. There was consensus regarding the need for professional athletes to train full time, as they do internationally, and participate in competitions throughout the year. Interviewee ten is of the view that the resources that are available are utilised inadequately, and described that these inadequacies are realised in the military, police, university and other facilities that are left vacant and unused. Another interviewee explained that exposure at international competitions is a necessity. Due to the lack of competition, athletes suffer from *stage fright*, and do not perform as expected.

Politics and Sports Performance

All fifteen interviewees commented on the influence of politics, and government in South African sports. Two of the interviewees expressed, in similar words, that sports and politics cannot be separated, and neither can politics and business, or politics and anything. They further commented that there is politics within organisations, and there are people with alternative agendas, who make the wrong decisions for the wrong reasons.

There are varied views regarding the role of the government in sports. Interviewee five commented that the South African government has improved its efforts regarding mass participation and provincial sports programs, but has not utilised the expertise of the specific sports federations. Interviewee ten remarked that the politicians have attacked the federations regarding issues of transformation. The interviewees reported that there are insufficient resources allocated for transformation and development of the sports, and there are insufficient pools of athletes participating to be competitive. Two of the interviewees commented that “athletes want to be selected on merit, and do not want to be stigmatised and selected as *transformation* athletes”. The process of transformation is described as problematic.

Some argue that the government’s role should be to create legislation and provide the facilities and resources for sports. A few of the interviewees have explained that the mass participation programs and transformation should be solely the government’s responsibility, whilst elite sports should be managed by the federations. And, others would like to engage government on efforts on mass participation. There were conflicting views regarding the actual role that government should play within South African sports. Several interviewees described poor communication and relationships management between the federations and South African Department of Sport, despite guidelines advised in the White Paper.

Corruption and Sports Performance

The interviewees had strong views on the effect of corruption on sports performance. One of the interviewees questioned the reality and definition of the word “corruption”, and reported the following “What I think is empowering, becomes a matter of interpretation”. The majority of the interviewees (thirteen from the fifteen interviewed) commented that the allocation of resources was often inappropriate. Furthermore, eleven interviewees suggested that resource wastage and extravagance are suggestions of corruption. It was noted that corruption was viewed in a financial sense, as none of the interviewees described drug usage amongst athletes as an example of corruption.

The interviewees described several examples perceived by them as suggestive of corruption. These include: the inappropriate appointment of board members; sports federations managed by a husband and a wife team; and examples of fraudulent transactions and persons not being accountable for the repayment of the funds. According to one interviewee, poor financial management and utilisation of funds is a result of poor organisational structures and processes, i.e. checks and balances. And, this is probably due to employing unskilled persons. According to one interviewee, corruption and misappropriation of funds tend to occur within the big and successful sports teams where there is an abundance of cash.

None of the interviewees commented on the positive effect of corruption on sports performance. Corruption was perceived as relating to theft and fraud. None of the interviewees described substance abuse and the illegal use of performance enhancement drugs as forms of corruption.

4.4 Conclusion

This chapter included a presentation and discussion of the results of the research. This was accomplished in two phases. An extrapolation of the results from both phases allows the researcher to conclude that there is evidence to suggest that the following propositions are valid.

4.4.1 Proposition One

There is evidence to suggest that the following socio-economic endowments of a country are determinants of sports performance:

- Financial and economic resources
- Demographics including place of birth and climate

4.4.2 Proposition Two

There is evidence to suggest that the following are the organisational dependent factors which affect sports performance:

- Goal achievement
- Resource utilisation: facilities; salaries; competitions; development
- Effective communication
- Simplicity of administration through sporting and political boundaries
- Trust and corporate governance
- Leadership
- Strategy and comprehensive planning.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter begins with a summary of the key findings of this research and the implications of the findings as it affects South Africa's sports performance. Thereafter, the findings will be assimilated and recommendations will be made for the various stakeholders that will benefit from the research. This chapter concludes with recommendations for future research.

5.2 Summary of the Findings

5.2.1 The Socio-Economic Determinants that affect South African and African Sports Performance

In terms of the findings in this study, a country's performance in sports is not only dependent on financial resources, but also on the level of investment in education, the heath of the population, and the level of unemployment in a country. South Africa has not been able to capitalise on the advantage of having a higher income compared to other countries, especially at the Olympic Games.

The performance at the 2008 Beijing Olympics cannot be simply attributed to a lack of resources. African countries that performed better at the Beijing Olympics compared to South Africa invest proportionately more of their income in education, health, and employment. However, in general, countries that performed better at the Olympic Games have a higher per capita income. This finding suggested that an investment in sports is considered a luxury good and one needs to question whether South Africa should indeed be preferentially allocating funds to sports performance, and whether South Africa should rather concentrate on education, health and unemployment which will in any event indirectly lead to an improved sports performance.

A controversial finding in this study includes the relationship between sports performance and the perception of corruption. The research suggests that

countries that perform better at sports are perceived as more corrupt. The definition of corruption is unclear.

The study finds that successful sports performance is dependent on attaining a competitive advantage. This advantage may be achieved through selectively allocating funds to elite athletes, information asymmetry and technical expertise. If South Africa wants to retain its skilled and talented human resources, then financial resources will be required and allocated specifically to pay these economic rents.

This study has also demonstrated conclusively that an investment in education will positively contribute to sports performance for South Africa. An investment in education also produces knowledgeable citizens, managers, health professionals, sports technical staff, administrators. The educated and skilled may contribute to a country's pool of knowledge and sports expertise (information asymmetry) and hence create a competitive advantage in sport.

5.2.2 The Organisational Determinants that affect South African and African Sports Performance

The findings suggest that sports organisations in South Africa are unable to function effectively due to lack of financial resources.

Due to the lack of financial resources the organisation cannot employ skilled managerial, administrative and technical staff, and as a result the sports organisations cannot accomplish their goals. The study finds that the organisations are unable to consolidate the appropriate leadership and an effective management team. The study finds that sports organisations fail to create a clear vision and direction, and have an inability to develop an effective business strategy. The organisations are inwardly focussed and have poor business forecasting and planning. Financial issues include the lack of working capital, poor cash flow management, and excessive overheads that deplete the limited budget.

The study also finds that there are poor operating processes, undocumented standard operating procedures, unresolved performance barriers, and lack of staffing and workforce development. An important issue that was addressed in the interviews includes poor communication and poor flow of critical information,

The organisations have failed to understand the customers' demands, and have an inability to differentiate between their competitors. There is lack of a skilled workforce, poor market expansion, and the focus is on the volume of participation, rather than profit. There is an inability to forge an effective culture and political discourse is disruptive. The study suggests that the South African sports community is fragmented and functions in silos with poor communication and coordination of resources.

5.3 Conclusions of the Study

The stimulus for this study was created following comments made about the South African Olympic Team's performance at the 2008 Beijing Olympics. The comments attributed the poor performance of the team to a lack of financial resources and organisational incompetence. This study provides evidence that suggests that South Africa's performance in sports is dependent on socio-economic and organisational determinants.

There are sufficient resources available in South Africa to compete internationally. South Africa should have achieved better results than what was actually achieved. And the failure to achieve results could have possibly been attributed to organisational inefficiency. This would be an incomplete assumption as sports performance is dependent on several factors. However, there is sufficient evidence in the research to confirm that there are several inadequacies within the sports organisations, including the improper utilisation of available resources.

The failure of the South African Olympic team is attributed to the inherent weakness of the institutions within South Africa. This study uniquely shows that sports performance is resource dependent and especially dependent on the

appropriate allocation investment in education, health, employment. The study confirms that South Africa is inefficient in its utilisation of resources compared to other African countries. Relatively resource-deficient African countries perform better in sports than South Africa due to their investment in education and health. Another contributing factor is that African participants from a temperate climate are disadvantaged at certain sports climates.

5.4 Recommendations

The findings from this study may be applied to various organisations and systems that are considering factors that affect performance. The researcher attempted to define various factors that affect the sports performance of resource strapped countries. The findings of this study suggest that sports performance or the performance of a system is dependent on the inter-relationship of various factors. It is inappropriate to consider a remedy of a single variable without considering the effect on other factors. If South Africa preferentially allocates funds to high performance sports without investing proportionately to education, employment, and health, there will be no net benefit. If anything, SA will be more inefficient and unsuccessful at the All Africa games and football.

However, a preferential allocation of funds to education, health, and unemployment will result in an indirect increased sports performance. In international competitions, South Africa is disadvantaged when compared to higher income countries as they have a greater propensity allocate excessive funds to education, health, and employment. To compete effectively this will require a strategic allocation of funds to a limited sports code. South Africa must select a few sports to specialise in, and develop a comparative advantage through information asymmetry and technical expertise.

The available funds will need to be efficiently allocated, and efficiently utilised. Shrinkage and inappropriate resource utilisation will have systemic effects as can be deduced from systems thinking. The sports organisations require funds to function. The funds do not necessarily have to be acquired from sponsorship

and donors. Sports organisations need to function as a business does: revenue generating; profit maximising and practice financial prudence to minimise operating costs. Businesses are dependent on effective structures, processes, and systems in order to function.

5.5 Suggestions for Further Research

There is a lack of research in the field of sports and organisational economics especially in emerging countries relative to the developed world. This report utilised a research technique employing the triangulation of cross-sectional data and semi-structured interviews to suggest that South Africa's performance in sports is dependent on socio-economic and organisational determinants. Further research can be conducted to confirm or refute the findings of this report.

This can be accomplished in the following ways:

- Longitudinal studies of countries and their performance over time.
- Panel studies of a number of countries over time and their performance in sport.
- Case studies eliciting a detailed understanding of a chosen country or organisation and sports performance
- Impact assessments of interventions study
- Replication study utilising different data.

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APPENDIX A

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Wits Business School Sculpting Global Leaders in Africa

40th ANNIVERSARY

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

26 February 2009

Dear Respondent

I am an MBA student at The Wits Business School. As a component of completing my degree, I am conducting an exploratory study of the socio-economic and organisational variables which affects sports performance in developing countries, with an emphasis on South Africa. Traditional research models are biased towards developed countries and make erroneous assumptions for developing countries. The aim of the research is to test the validity of those assumptions and to identify specific factors relevant for South Africa.

I would be grateful if we could schedule an appointment at your convenience in order for me to conduct an interview regarding your experiences and insights into South African sports performance. This process will be in accordance with strict academic guidelines and your anonymity will be ensured. The results of the interview will be integrated into a research report in completion of my MBA. The report together with the recommendations will be a resource for future students and the wider sporting community.

Your contribution will be a vital addition to my research so I hope we can arrange an interview time soon.

Your assistance in this regard is most appreciated. My supervisor in this regard is Prof John Luiz who can be contacted at the Wits Business School at the number above.

Sincerely

Dr R Fadal

BSc Mbbch Mdch MSc (Sports Medicine) MBA (candidate)

Semi -structured interview: Prompt sheet

1. How important are economic resources in ensuring the success of your sport
    - Are the resources sufficient to succeed internationally?
    - If no…can you explain how countries like Kenya are able to win more medals at the Olympics than South Africa?
2. How do you define the key performance indicators in the organisation
    - How does your organisation define success?
    - Do you believe that the definition of success is consistent for all members within the body of sport?
3. How do you define strategy in your organisation?
    - Does the organisation have short term and long term goals
    - Do you have a strategy for resource allocation
4. Do you believe that the resources are utilised adequately?
    - How are your resources allocated, spent
    - The Australians for instance reward success, and therefore invest more money in sports that have an increased chance of success.
    - Should we have a strategic target approach to sports success
    - Should we invest in team sports at the Olympics
5. How effective is the organisation in identifying and developing potential athletes
    - Are we able to recognise talent
    - Is there funding for school sports
    - Should we groom our youth in specific sports
6. How effective has your organisational structures been in dealing with the sports challengers that you face as a body
    - How do you resolve disputes, issues of corporate governance, ethics, etc
    - Do you utilise technology for communication, administration, database of all participants, scientific advice, etc.
7. To what extent does politics promote or hamper sports performance in South Africa

A list of respondents contacted for interview. Not all of those contacted were available for comment. Due to purposes of anonymity all the respondents that were contacted were included in the table below:

Name	**Organisation**
A. Bacher	Cricket SA
S. Ramsammy	International Olympic Committee
B. Manning	Archery SA
Z. Ledwaba	Government sports
G. Sam	SASCOC
M. Malehopo	Athletics SA
R. Hack	SA Football Association
W. Du Plessis	Rowing SA
W. Riechart	Basketball SA
I. Smith	SA Tennis Association
I. Cunningham	Disabled Sports SA
S. Andriaanse	Swimming SA
D. Baxter	Wits University Sports
A. Scott	Nedbank corporate sponsor
J. Masia	Gymnastics SA
I. Patel	SuperSport
J. Robby	Radio 702, Rugby-sports commentator

APPENDIX B

Consistency Matrix

The purpose of this research is to explore the socio-economic and organisational determinants affecting African sports performance, with an emphasis on SA					
Sub-problem	**Literature Review**	**Propositions**	**Source of data**	**Type of data**	**Analysis**
The first sub-problem is to explore socio-economic variables that affect sports performance	(Novikov and Maksimenko 1972; Kiviaho and Makela 1978; Baimbridge 1998; Condon et al. 1999; Andreff 2001; Kuper and Sterken 2001; Szymanski 2001; Hoffmann et al. 2002; Fan and Rao 2003; Tcha and Pershin 2003; United Nations 2003; Bernard and Busse 2004; Hoffmann et al. 2004; Johnson and Ayfer 2004; Matros and Namoro 2004; Churilov and Flitman 2006; Cote et al. 2006; De Bosscher et al. 2006; Luiz 2006; Hawksworth 2008; Rathke and Woitek 2008; Samoilenko 2008)	The socio-economic endowments of a country are a determinant of a country's sports performance.	Quantitative analysis, Data sources include: http://data.un.org http://www.forumelitesport.org: http://www.freedomhouse.org: http://www.transparency.org:	Nominal and categorical data	Multiple Regression, (Ordinary least squares regression)

The second sub-problem is to identify organisational factors that affect sports performance	(Perrow 1961; Hannan 1977; Chalip 1995; Roberts and Greenwood 1997; Dine 1998; Gould et al. 1999; Longenecker et al. 1999; Papadimitriou and Taylor 2000; Parkhouse 2000; Oakley and Green 2001; Amis et al. 2002; Bloomfield 2002; Weinberg and McDermott 2002; Baker et al. 2003; Green 2004; Hoffmann et al. 2004; Ferkins et al. 2005; Gerrard 2005; International Forum on Elite Sport 2005; Jakobsen et al. 2005; Martin et al. 2005; Cote et al. 2006; De Bosscher et al. 2006; Baker and Logan 2007)	Organisational dependent factors affect the sports performance of a country.	Semi structured interview, Convenience sampling	Qualitative data, Opinions, and commentary	Thematic analysis