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Corruption and Soccer in Africa: Empirical Evidence on the Determinants of Association Soccer Success in the Continent

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CORRUPTION AND SOCCER IN AFRICA:

EMPIRICAL EVIDINCE ON THE DETERMINANTS OF ASSOCIATION SOCCER SUCCESS IN THE CONTINENT

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ABSTRACT

Despite the popularity of soccer in Africa, African teams tend to underperform in international competitions such as the World Cup relative to European and South American teams. Studies have been conducted on what determines performance in international soccer. These studies stress the importance of wealth, talent pool, and soccer culture on determining performance. However, these studies focus more generally on the entire world, and, in some instances, omit African nations due to a lack of data. Additionally, the focus on a wide sample of the world results in the omission of some potentially crucial variables in relation to Africa, specifically corruption. This paper examines the determinants of African Association soccer team success using statistical tools employed in the literature. In addition to corruption, this study examines wealth, talent pool, colonial heritage, and regional affiliation. The results confirm the positive impact of wealth on performance and, contrary to some studies, showcase statistically significant positive impact of talent pool size on performance. Furthermore, this study reflects the need for a more direct assessment of institutional performance of soccer association generally, as well as developing a more comprehensive model in addressing the relationship between corruption and soccer for further investigation and thus better policy design.

KEYWORDS

Soccer, Africa, Corruption

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INTRODUCTION

When it comes to the most popular sport in the world, soccer possesses a unique position in reflecting and impacting the political and social structures of a given nation. Starting in the late nineteenth century and early twentieth century, and in line with the development of soccer within European societies, the sport started to diffuse into European colonies. For example, in British African colonies, such as Gold Coast, soldiers and traders started to practice the sport in an effort to promote discipline, teamwork and masculinity (Alegi 2010). To compete against the British traders, all-black teams started to form. Later on, those teams became powerful tools in the hands of independence leaders, freedom fighters, and the people to express anti-colonial sentiments and rally for support. This pattern was recreated in other colonies throughout Africa. Since then, soccer has become the most popular sport in the continent. As the game progressed in Europe, South America, and elsewhere, organization of soccer in the continent started to form and countries started to gain membership in regional and international soccer federations.

Despite the popularity of the sport in Africa, soccer in the continent faces hurdles to development. Some suggest that African national teams have been struggling with underdevelopment, corruption, and mismanagement, all of which have prevented them from competing in the top level of international soccer, and to achieve success in regional competitions (Chiweshe 2014). On the international level, although participation in the World Cup by African teams has gone up since the inauguration of the Confederation Africain de Football (CAF) in the 1950s, African teams still struggle to make it through advanced stages of the competition. Underperformance of African national teams can be explained through different factors some of which have been examined in the literature of determinants of international soccer success. One variable previous studies did not investigate closely is Corruption.

Studies conducted on the determinants of success in association soccer have not focused solely on the African continent, but included samples of the whole world. In most cases, some of the African nations were omitted from analysis due to lack of data at the time of the study, or because it spans back further than the data exists for some of the countries. The studies looked at the impact of wealth, talent pool, soccer culture, institutions, and colonialism among other variables on soccer performance. The majority of studies confirm the positive impact of wealth

on performance, while some finds a positive relationship of talent pool conditional on the culture of the country examined. By focusing solely on African nations, this paper investigates if the variables found to be significant in past studies hold the same implication when it comes to African teams.

While recent studies analyze essential factors to understand the world soccer order, a more focused approach on the continent can provide us with a better insight into what shapes performances of African teams. Consequently, in this paper attempts to explore the impact of corruption on association soccer in the continent, as well as, examine the determinants of association soccer success of Africa's teams. To do so, a regression analysis of cross sectional data from the year 2006 is utilized. Analyzing corruption in the context of soccer in Africa informs us not just on its impact on performance, but also about the extent to which corruption is ingrained in national institutions.

In line with past studies, this paper's results confirm the positive impact of wealth on performance. At early stages of development, soccer did not receive much care. However, as nations developed and capital became less scarce, more and more capital was devoted to the sport, thus elevating the quality of soccer in the given country. Additionally, as in previous studies, test outcomes also show that talent pool has no significant impact on performance. Furthermore, corruption as measured by the World Economic Forum index, Diversion of public funds, does not carry statistical significance in determining performance. However, the relationship of Wealth with performance might explain performance's relationship with corruption, since wealth is usually correlated with corruption. Additional details from the tests are discussed more thoroughly in the results section.

BACKGROUND

To understand the state of African Soccer today, it is important to discuss some of the crucial realities of the game in the continent. In this section I will provide a background of African soccer, exploring multiple aspects of the game in the continent. Firstly, I will explore the diffusion of soccer in Africa, focusing on its colonial history and early stages of development. Secondly, I will highlight the Impact of soccer on reflecting the social and political realms of the various stages of the sport in Africa, as well as follow the development of the sport as a political tool in the continent. Then, in the following section I will review the literature on the

determinants of Association soccer success and their implications on the continent.

Diffusion of Soccer in Africa

The diffusion of the sport in the African continent dates back to the colonial period. In his book African *Soccerscapes*, historian and professor at Michigan State University Peter Alegi characterizes the early stages of diffusion as 'white man's burden' (Alegi, 2010). The colonizers took it upon themselves to 'civilize' the masses in Africa, to introduce Christianity, and Europeanize them. Nevertheless, the introduction of the sport to the continent was impacted by the development of the sport in the home nations of the various colonizers. While soccer culture was in more developed stages in Britain, it was just starting to catch up in France, Italy, Belgium, and the rest of the colonizers home nations. For example, In the mid 1800s, British settlers started to form teams in the colonies. While the first recorded game was in South Africa in 1866, French settlers started to form clubs in Algeria in the 1890s (Alegi, 2010). Soccer was not free from the social complexities of the time. Colonial racism, which was an integral part of the colonizers approach to the colonial subjects, was reflected in soccer. According to Alegi, "white teams enjoyed access to adequate playing facilities built with African taxes, a privilege not afforded to colonial subjects" (Alegi, 2010). Later on, railway and development in urban centers across the continent brought more people into the game.

Soccer's growing popularity in the late 1940s and into the 1950s, and with the heightened activities within independence movements, was seen as a tool at the hands of independence leaders to grasp the support of the masses (Sugden and Tomlinson, 1998). Reflecting the anti-colonial tensions was the intercolonial games which was evident in French Africa. The commencement of the French West Africa Cup in 1947 brought various teams from across west Africa to compete for the cup. With the growing numbers of teams and intensity of rivalry, the competition was the field for the evolving national identities expressed by the various groups. The increased rivalries went against wishes of the French, as they hoped the sport would serve as a platform to unite the regions and distract them from the political environment surrounding other colonies (Alegi 2010).

The African leadership at the time did not just use the sport to put Africa on the map, but also as a mean to gain support for their political agendas (Sugden and Tomlinson, 1998). Ever since, soccer in the continent has been used as a political tool by some governments as a way of

diffusing tensions, as it is used by governments around the world. Additionally, Soccer grasped the "imagination of diverse populations" as they came out of colonialism, and thus it was subject to "political interference and economic exploitation" (Sugden and Tomlinson, 1998). However, in many instances soccer was used as way to unify the nation and thus easing tensions in post-civil war situation, such as in Ivory coast after it came out of its first civil war which devastated the country for 5 years (Bloomfield, 2010). Regional political rivalry fuels the intensity of games. Examples of that intensity can be seen in the disputes aroused between Sudan and Chad in 2006 prior to a scheduled soccer game. The Game was later played in a neutral ground, Cairo (Bloomfield; 2010). This goes to show the significance of soccer as a political tool and a potentially a catalyst for political transformation.

Soccer and Identity in Africa

As nations started to form and nationalistic movements sprang up around the globe in the mid nineteenth century and into the twentieth century, people started to ask themselves: what does it mean to belong to their country? The ethnic, religious, and racial diversity of the various nations around the world made it hard for people to unite under one name, one flag. One thing people seemed to come around is their national soccer team. When the national team plays, everyone gets behind it. To them, their team represented them, their ideals, and a victory to their team was a victory to their nation as they perceived it. Soccer both constructs national identity and is constructed by nationalistic ideals of the respective country (Dubois, 2010). In his book *Soccer Empir*e, Dubois (2010) analysis the usage of soccer in Algeria as a tool for resistance and expressing anti-colonialist sentiments, thus reflecting the political and social climate of the time. In the late 1940s, the FLN (Front de Liberation Nationale) established a soccer team in Algeria as a form of resistance to French colonialism. They played games in Eastern Europe and Asia as a way to grasp global support and to raise attention to the movement. When Algerian players playing for French national team were called to represent the FLN, they agreed. For the FLN this exhibited the support they have in Algeria and abroad and served as a sanction on the French national team, by denying France "the services of key players" (Alegi, 2010). The waving flags, chants, and national anthem were all present wherever the team played (Dubois, 2010; Alegi, 2010). The body of literature links soccer with national identity (Giulianotti, 1999), and globalization (Foer, 2004).

Soccer also served as a preliminary inauguration of foreign policy for the newly independent African nations (Darby, 2002). In the African continent and by the time countries started to gain their independence, they started to join various international organizations, such as the United Nations, and also in sports such as the International Olympic Committee, and Fédération Internationale de Football Association (FIFA). The increased presence of African membership in FIFA, prompted the leaders of African Soccer Associations to form the CAF (Confederation Africaine de Football). Founded in 1957 by Egypt, Ethiopia, Sudan, and South Africa, the CAF acts as a governing body for African soccer and represents the continent as one of the six continental federations under the FIFA. Furthermore, the CAF is divided into 5 regions (West, North, East, Central, South).

Early on when African nations joined the CAF after gaining their independence, they started to experience first attempts at regional cooperation. Aside from the African Union and other regional organizations, the CAF gave African leaders a test at combating post colonialist and racist systems embedded throughout the colonial past of the continent. An example of the success of regional cooperation came at the collective push to suspend the membership of South Africa in the FIFA as well as in the CAF, in part of fighting the apartheid system at the time. The suspension of South Africa was at the heart of the FIFA 1974 presidential election. This election presented the prowess of the African nations vote, considering their share of votes. The 'Havelange vs. Rous' election culminated at securing the African vote. While the incumbent Rous insisted on opposing the suspension of the South African soccer association, Havelange traveled through Africa marketing for his anti-apartheid approach (Sugden and Tomlinson, 1998; Darby, 2001; Alegi, 2010). Later on, Havelange instituted measures to assist qualified African nations to the World Cup, as well as initiating youth development programs in the continent. Although, some view Havelange as a champion of African soccer, others view him as a politician banking on the votes of African nations.

Havelange's relationship with African Associations started to dwindle by the end of his term. In the late 1990s, Havelange, in an attempt to 'boost his popularity' in the continent, started to hint at a potential hosting of World Cup finals by an African nation in 2006, more specifically South Africa. The move enraged the UEFA who were intending at supporting a European candidate to host the tournament. After FIFA's move to award the 1994 World Cup finals hosting to US at the expense of Morocco, Havelange tried to appeal to the African nations by

offering up what is seen as a conciliatory move, the hosting of the 1995 U-20 World cup to Nigeria. Later, FIFA reneged their decision and transferred the hosting rights to Qatar, citing health concerns in Nigeria, as well as difficulties of securing health insurance by some European soccer associations. To mend the wounds, Havelange promised to give Nigeria the right to host the 1997 version of the u-20 tournament. This move resulted in a backlash, when the Asian federation where surprised that Malaysia's given rights to host the tournament were rescinded (Sugden and Tomlinson, 1998; Darby, 2002). Nigeria ended up hosting the 1999 version of the tournament.

LITERATURE REVIEW

Determinants of International Soccer Success

In recent years, political and sports economists started to explore the determinants of international soccer performance. Those researchers have primarily utilized statistical measures to understand the impact of potentially influential variables on international soccer performance. These studies employed multivariable regression tests using international soccer data to empirically test out the effects of each potential factor. It is important to note that these studies use different measures of team performance as the dependent variable in their regressions. While Kuper and Szymanski (2010) use goal difference and winning percentage as an indicator of team performance in one of their tests, Hoffmann et al. (2002) and Leeds and Leeds (2010) use the Coca-Cola FIFA ranking as a proxy, and Gasquez and Royuela (2016) use ELO rankings. The benefit of these measures is that they are comprehensive when it comes to the total of games played by a given team, however, they include friendly games which do not carry the same rate of competitiveness that usually accompanies a soccer tournament such as the World Cup. The ELO and recently the FIFA rankings have approached this problem by quantifying the performance of a given national team by assigning different weights to the different types of games, making it more accurate in measuring national team performances.

Throughout these tests, patterns started to appear confirming some of the theories about international soccer. For example, economic performance, as measured by GDP per capita exhibits a positive relationship with international soccer team performances (Hoffmann et al, 2002; Torgler, 2004; Kuper and Szymanski, 2010; Leeds, M and Leeds, E 2009; Gasquez and Royuela, 2016). However, Hoffmann et. al (2002), using GNP per capita, concluded that as an

economy develops its national team performance improves but then it diminishes as the nation approaches a certain level of income then start to go down. The authors attribute this relationship to soccer being a "capital un-intensive sport" (Hoffmann et al, 2002); all you need is a ball and space. Additionally, as families get richer, they can afford other forms of entertainment reducing playing time, and thus greater wealth could harm a countries' performance. This relationship has been confirmed by the succeeding studies on measuring determinants of success (Torgler, 2004; Leeds and Leeds, 2009, Gasquez and Royuela, 2016). Overall, tests show the more resourceful a nation is the better it performs (Kuper and Szymanski, 2010).

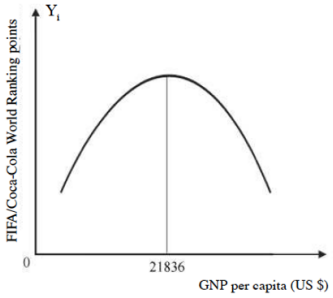

Figure 1: relationship between wealth and FIFAranking (Hoffmann et al.,2002)

Resources are essential to national teams' performances; the more resourceful a country is, the better it is equipped to excel on the field (Kuper and Szymanski, 2010). Resourcefulness of a country translates into its financial capability, size of the talent pool, and experience playing and managing the game. In most studies, talent pool measured through population size, does not exhibit a statistically significant impact on performance (Kuper and Szymanski, 2010; Leeds M and Leeds E, 2009; Hoffman et. al, 2002; Torgler, 2004), on the other hand, one study shows a statistically significant impact of population size, when measured in a panel data setting (Gasquez and Royuela, 2016). In the other studies, only when culture was considered, the population size exhibited a statistically significant impact. For example, Hoffmann et al. (2002) included an interaction term in their model which indicates the impact of population growth, when the country considered is of Latin background. In Latin countries, the larger the population is, the better its nation perform. Hoffman et al. concluded that countries with weak soccer culture tend to have other competing sports. These competing sports absorb a fraction of population growth which then makes population size insignificant in determining the talent pool.

Another essential variable when it comes to resources is experience, as measured through number of games played by the national team. The significance of this relationship can be seen through a simple comparison between England and Senegal. England played their first game in 1892, while Senegal played theirs in 1961; the latter has a higher ELO rating than the former.

Greater experience yields better performance (Kuper and Szymanski, 2010).

Apart from countries' resources, political factors such as communism, freedom, colonial heritage, oil production, and OECD membership have shown some impact on teams as shown in a study (Leeds M and Leeds E, 2009). The authors find that communism is negatively related to performance. They also find that former colonies tend to underperform relative to their colonizers (Leeds M and Leeds E, 2009). These results reflect Kuper and Szymanski's comparison of challenges facing international soccer to the theories expressed by development economists. Import substitution, the importance of networks and connectivity, and openness to innovation are all factors apparent in development of soccer globally (Kuper and Szymanski, 2010).

These empirical studies highlight some of the important factors in deciding the world soccer order. However, they do not take into consideration some of the factors that may be significant to African soccer performance, such as corruption of soccer associations. In this paper, controlling for the essential factors suggested in the literature, corruption will be assessed as a determinant factor of soccer performance. Apart from corruption which is the main focus of this paper, colonial heritage, regional affiliation, and migration, are all variables worth exploring in analyzing the performances of African national teams.

Hurdles in the Development of Soccer in Africa

African nations face similar hurdles to those faced by other developing nations. Nevertheless, the level at which these hurdles exist in Africa is impeding. The heart of all these obstacles can be summarized in the following statement:

> "Extreme poverty is the most serious obstacle to the development of football in Africa and regularly countries are forced to withdraw from international competitions because national federations do not have the money to send their teams abroad…The financial misery of African football is accentuated through the corruption which so often goes hand in hand with the administration of football on the continent" (Sugden and Tomlinson, 1998).

According to the authors, Sugden and Tomlinson (1998), Corruption is referred to as the cancer of African soccer. The popularity of the game in Africa makes it an attractive source of financial gains through "sponsorship deals, television contracts, gate receipts and government officials"

capitalizing on all these potential sources of income (Sugden and Tomlinson, 1998). Politics surrounding African soccer is resembled in what the author Jean Bayart calls the 'politics of the belly', a term used to describe the patronage systems in Africa (See Bayart, 2010).

Assessing factors introduced by the literature on determinants of soccer success in relation to Africa help us put things into perspective. In addition to economic standing relationship with performance, talent pool in the continent is another potential variable that might prove to have an effect on performance. According to FIFA's 2006 'Big Count', the majority of players in the continent, who constitute 17% of total players in the world, are not properly registered at the soccer association of their respective countries (See FIFA Big count. 2006). Nevertheless, the size of population in itself is not enough to explain the quality of the talent pool. An important factor that differentiates richer economies from poorer ones, is the health of their populations. Kuper and Szymanski (2010) highlight in their analysis the impact of malnutrition on the physical attributes of athletes thus preventing them from reaching their potential. Consequently, the authors claim that countries with a bigger ratio of stunted players tend to underperform. Steven Pienaar, the south African star player who grew up in a colored township in the era of apartheid is known for his "prepubescent boy" body figure (Kuper and Syzmanski, 2010). This phenomenon is not uncommon in the South African team. They argue that "most likely, Pienaar is reedy because he grew up malnourished and without much access to doctors" (Kuper and Szymanski, 2010).

The debate about why African teams perform poorly is an ongoing one within the soccer community, not just within the continent, but globally as well, since the best African players feature in top flight soccer in Europe. Yaya Touré, an Ivorian star who plays at the top level in Europe, who won African player of the year three consecutive times, has never won the English premier league player of year award, let alone player of the month, nor did his Ivorian counterpart Didier Drogba. Yaya Touré frustratingly stated that African players don't get as much recognition as they should. He received criticism shortly after his statement (Muller, 2014). On the other hand, the former CAF president and senior vice president of FIFA, said that the top players, who usually play in Europe, underperform when playing for their national team, afraid of being injured and thus decreasing their market value (FAIR Investigative team, 2010). Former England star John Barnes referred to the same issue indicating that there's a mental tweak which exists in African players, he claimed that "Africans must show the same desire and

discipline when playing for their country that they do when playing for European clubs" (Muller, 2014).

Corruption In African Soccer

The literature lacks thorough analysis of corruption in African soccer and the dynamics that accompany it. Some of the studies done on African soccer discuss the role of corruption in the maladministration of the sport (Pannenborg, 2010). Some suggest that the level of corruption led to the failure in combatting issues facing the sport in Africa, such as the exodus of African talent to Europe (Darby, 2007). One paper in particular addresses directly the relational operations between corruption and underdevelopment of soccer in Africa (Chiweshe, 2014). Chiweshe draws mainly from a 2010 investigative report on multiple incidents of corruption in African soccer across various countries (FAIR Investigative team, 2010). Talking about corruption can be hard due to the vagueness of the term in relation to soccer. Therefore, I mention some of the incidents cited in the literature, and in the following section I explain how can corruption influence performance.

Corruption in soccer is not solely an African problem, "match fixing, bribing officials, [rigged] player transfers [and] sponsorship deals" are all incidents that have been occurring regularly on the international level (Chiweshe, 2014). However, the scope in which corruption exists in African soccer denies the sport from developing and the national teams from performing better on both the regional and international levels. Chiweshe (2014) mentions that incidents such as "missing funds…presidents who serve for decades, underpaid players, [and] poor infrastructure" have all been encountered multiple times. In 2010 the Forum for African Investigative Reporters (FAIR) published a report underpinning corruption incidents which had taken place in the past.

According to the same report, in 2009, officials from the Ivorian football federation had sold 2000 more tickets than the capacity of the Felix Hophouëet stadium (35,000) for the World Cup qualifying game against Malawi. The fraudulent selling of the extra tickets resulted in a stampede which claimed the lives of 20 fans as well as injured another 135. Additionally, the authors cite incident of stolen funds. For example, in the 1998 World cup, the Cameroonian minister of communication who was supposed to carry the players' allowances to France where the World Cup was held, claimed to have lost the bag in the aircraft; the money was never seen

since (FAIR Investigative Team, 2010).

MODEL AND DATA

In this paper, I use multivariable OLS regression tests to examine the impact of determinants of association soccer success in Africa. More specifically, I conduct a cross-sectional regression test, using data from the year 2006. The choice of the year 2006 was due to the availability of accurate data on the talent pool variable which I will discuss further. The variables choice is taken mainly from the determinants of International Soccer performance literature. These variables measure a variety of factors such as wealth, talent pool, experience, colonial heritage, and regional affiliation. To these variables, corruption is included.

First of all, the sources of the data will be discussed, how they are measured and how can they potentially explain some of the variation in performances. Then I will delve into the methodology and the model specification. Finally, the results from the regression tests will be discussed, including potential implications around them.

Dependent Variables

The dependent variable in this study, which is used to measure team performance in a given year, is the ELO Soccer ratings. The ELO was first introduced in the game of chess, but has been used more recently as a more reliable indicator of Soccer team performance. Examining the predicting power of ELO rating, Hvattum and Arntzen (2010) concluded that results justify the use of ELO as a measurement of team strength. Royuela and Gazquez (2010), cite the study and advise future research to use it as a proxy for team performance. While FIFA's measuring criteria has not been consistent through the years, as of recently, they have adapted a framework of assessment which takes account of the strength of the opponent, and the tournament which the game is played at. The ELO uses a similar set of criteria. Most studies have used FIFA or ELO ratings to measure team performance of a given team (Leeds, M and Leeds, E 2009; Gasquez and Royuela, 2010), while Syzmanski and Kuper (2010) used winning percentage and goal difference in their book *Socccernomics*. For the regression test, which is a cross sectional regression that utilizes data from 2006, this paper looks into the ratings of 51 countries of the 54 African nations. The three omitted countries are: South Sudan, Guinea-Bissau, and Sao Tome

Principe. These countries were not included due to the shortage of data. See table N, and figure 4 for the list of countries included in the tests.

Table 1: The list of countries included in analysis and their ELO ratings. (See www.*eloratings.net*:)

ELO rating of African Nations (2006)			
Team	ELO rating	Team	ELO rating
Cameroon	1780	Cape Verde	1328
Nigeria	1776	Kenya	1316
Ivory Coast	1765	Malawi	1313
Ghana	1746	Niger	1306
Egypt	1717	Tanzania	1305
Morocco	1648	Botswana	1301
Senegal	1648	Rwanda	1300
Tunisia	1633	Sierra Leone	1295
Angola	1589	Mozambique	1279
Guinea	1578	Benin	1276
Mali	1548	Liberia	1271
Zambia	1545	Mauritius	1262
South Africa	1472	Burundi	1262
DR Congo	1472	Chad	1250
Zimbabwe	1459	CAR	1218
Libya	1440	Namibia	1205
Togo	1431	Mauritania	1190
Burkina Faso	1421	Swaziland	1184
Algeria	1416	Madagascar	1180
Ethiopia	1402	Equatorial Guinea	1178
Uganda	1393	Eritrea	1131
Gabon	1388	Lesotho	1121
Sudan	1370	Seychelles	1118
Congo	1366	Somalia	945
Gambia	1347	Comoros	871
		Djibouti	805

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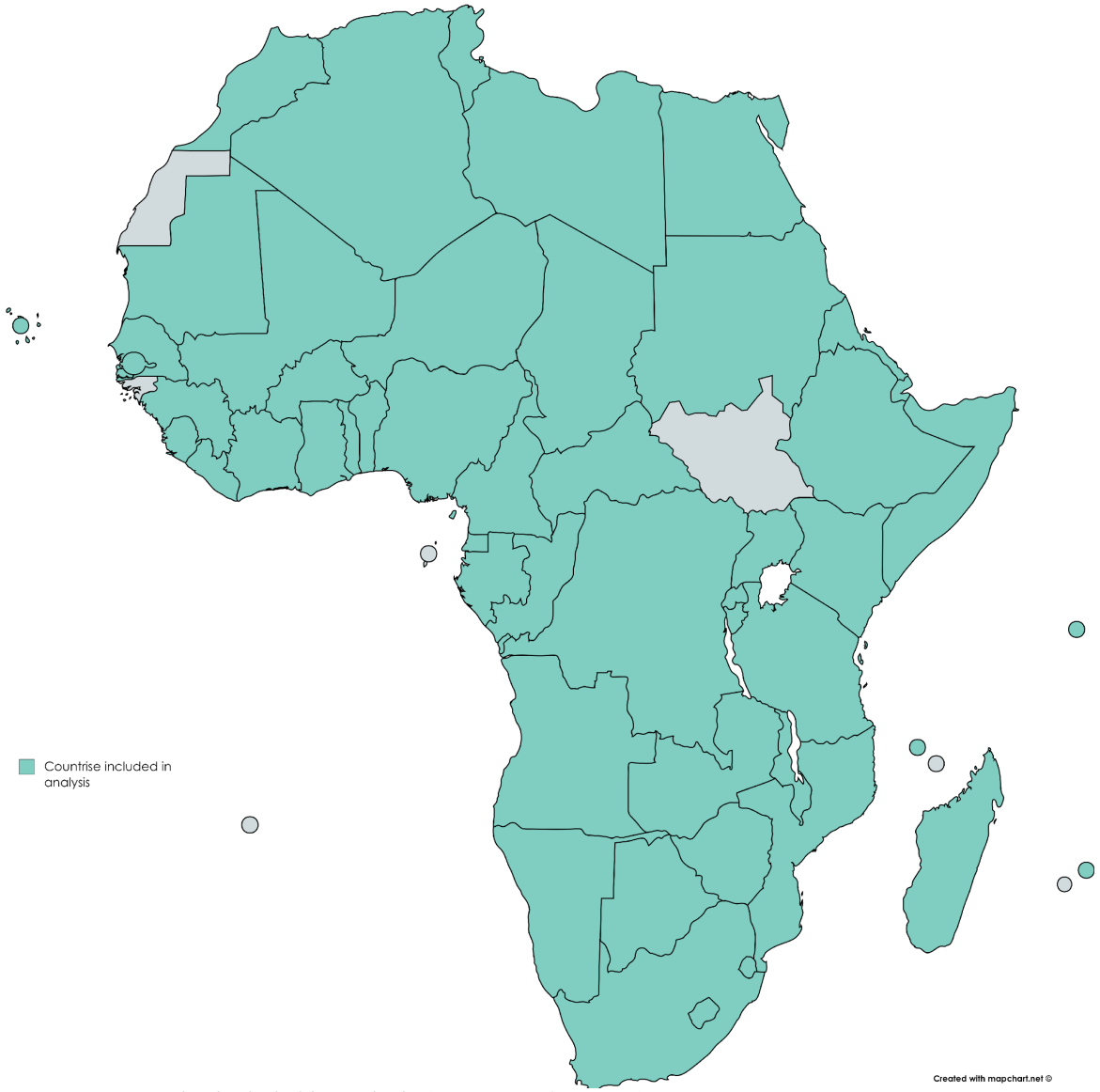

Figure 2: Countries included in analysis (*www.mapchart.net*:)

Wealth

For measuring wealth of a given country, this paper uses GDP per capita as an indicator of a country's economic standing. Previous studies have consistently used GDP per capita variable to measure the impact of wealth on the performance of national teams (Hoffmann et al., 2002; Torgler, 2004; Kuper and Szymanski, 2010; Leeds, M and Leeds, E 2009; Gasquez and Royuela, 2016). Alongside the positive relationship between wealth and performance, these studies have observed a diminishing return of performance in respect to wealth. That is, as

countries develop, they perform better, but at a diminishing pace, until a certain point where performance start to go down (a U inverted relationship). This relationship is attributed to the capital un-intensity nature of soccer; starting at low income levels, soccer functions as a leisure activity that is affordable and thus kids spend more time playing it. However, as families get richer, they start to provide other kinds of leisure activities to their kids reducing playing time (Hoffman et al 2002). Additionally, Richer countries have more resources to invest in the development of the sport. From initiating youth academies, to building infrastructure, these essential steps to the development of the sport require the country to be financially more capable.

To measure the impact of GDP per capita on performance, first the variable is linearized by taking its natural log [Ln(GDP)]. Any increase in Ln(GDP) will be interpreted as a percentage increase instead of a unit increase. Then, to test the inverted U relationship between wealth and performance, the variable is squared $[ln(GDP)]^2$. Since my observations are 51 countries from the African continent, a strong U inverted relationship is not anticipated, but a diminishing return relationship is. For the former, a positive relationship is expected.

Talent pool

Another important variable that has been subject to different results in different studies is talent pool. Most of these studies have used population size as a proxy to talent pool. The intuition is that the bigger your population is, the bigger your talent pool from which you select your team. Population size have showed statistically significant impacts in some studies (Kuper and Szymanski, 2010; Leeds, M and Leeds, E 2009; Gasquez and Royuela, 2010) and statistically insignificant in others (Hoffman et al. 2002). However, in 2006 FIFA released a table including the total number of registered soccer players in a given country, as part of their 'big count' project which aims at measuring the number of players worldwide (See FIFA big count, 2006). I utilize this available source in my cross-sectional regression test which uses data from the same year of the 'big count' report, 2006. In earlier studies, population size did not present a statistically significant impact. Hoffman et al. (2002) attribute this to the fact that, relative to the world, populous countries such as China, India, and the US are not successful at the sport. Further into their paper, they state that culture is a vital factor in determining success. Thus, as a population grow in size, other sports that are more popular in other countries (e.g. Cricket in India, Basketball, football, and baseball in the US…etc.) absorbs most of that growth.

Therefore, the more popular competing sports there are in a given country, the less impact population size will have on soccer performance.

Nevertheless, the variable used to measure talent pool in the model is the Number of players in the given country's soccer association. The expected relationship between talent pool (denoted as NumPlayers in the model) and ELO points is a positive one; the more players there are in a given country, the bigger the talent pool is and thus, the better a country performs.

Team experience

African nations have gained their independence, for the most part, in the 1960s; Thereafter, they started to join international and regional bodies such as the United Nations and the African Union. They started to form soccer national teams and compete against other nations. The amount of years a given national team has been playing as a nation in the international venue varies throughout the continent. This variation is due to the different years in which the national teams started to form. Thus, teams that have been involved in games longer than others carry more expansive experience. Experience have showed up in Syzmanski and Kuper's (2010) analysis an element indicating resources to a country's performance. Alongside wealth and population, they consider experience, using the number of games played by each nation, concluding the statistical significance impact of experience on performance. The relationship between experience and performance can suffer from endogeneity, since winning games qualifies you to further stages of various competitions, thus increasing the number of games played. Another way of measuring experience can be the number of years since the soccer association was established and active. When it comes to Africa, this is not a perfect measurement, due to the frequency of conflicts in some nations which prevents them from playing games and thus gaining experience. Because of all these complications to measuring experience, I decided to exclude the variable from my regression test.

Colonial heritage

Colonial heritage has been examined by Leeds and Leeds (2010). Colonialism resembles a central role in the diffusion of the game in the continent, let alone most of the developing world. While British colonizers brought the game in earlier than others, French, Portuguese, Belgian and others, have all followed thereafter (Alegi, 2010; Darby, 2002). This discrepancy in

diffusion of the game among European colonizers can be attributed to the various pace at which the game developed in the colonizers' home nations. While soccer was strictly introduced to the African elite educated in British schools, the game spread rapidly throughout the cities and elsewhere. The impact of colonial heritage can be captured in the model using a dummy variable for each colony. Here it is examined as to how the development of the game per the colonizers' time and way of diffusion affect the performance. Expected results from this variable can be that countries with British colonial tradition might experience a boost in their performance due to the earlier diffusion of the game than other colonies.

Corruption

The connection between corruption and performance is not as clear as that of wealth and performance, which then can make it tricky to measure. However, in this paper I attempt to categorize the kinds of impact corruption might have on performance and explain how I measure it. Corruption can impact performance directly and indirectly. Directly through match fixing, where the game results are predetermined through bribing officials, or either sides of the game to, for example, concede a goal or more goals. However, indirect impacts can come in the shape of missed or lost funds, unpaid allowances to players, incident of stampedes, all of which might potentially impact the mentality of players and thus performance.

Pay scandals, match fixing allegations, and player disputes has always been marred with African teams' participation in the World Cup. Three of the five teams participating in the latest World Cup in 2014 have been involved in corruption schemes. Prior to the tournament's kick off, Cameroonian players refused to board the plane, protesting unpaid allowances. Additionally, Ghana had to fly $3M USD in cash to Brazil, when players threatened to boycott the match demanding their "appearance fees" (FAIR Investigative team, 2010). The World Cup is not the only venue in which this act is repeated, but at the regional level corruption has become normalized in the game. Needless to say, corruption in soccer is not an African issue and it is at the core of the world soccer governance, FIFA. However, the size and significance in which corruption appears in the continent is astounding. There are no indices that measure corruption at the soccer association level. Yet, there are various investigative journalism reports that document some of the incidents that took place in the last 20 years. Usually, players are offered bonuses and allowances for representing their countries in regional and international competitions as an

incentive. These allowances are often given in the form of cash. Thus, officials representing the soccer associations would fly with the team holding bags of cash. This cash is then disappeared. This anecdote has been repeated over and over again (FAIR Investigative team, 2010). Additionally, the funding of development programs and national teams' participation came not just from private companies but the government as well. Therefore, to measure the impact of corruption on performance, incidents of reported corruption were first gathered. A limitation to this method is that not all countries have reported incidents. Nevertheless, a relationship between incidents of corruption and a corruption index is established, and therefore the index is used as a proxy for corruption at the soccer association level.

To measure the corruption of soccer associations, the reported incident of corruption, mainly from the 2010 Forum of African Investigative Reporters (FAIR) report, were collected. For each incident of corruption reported in a given year the country is given a point. The more points the country has, the more corruption incidents are reported for that country in a given year. It is also important to note that, due to the limited number of countries with reported incidents, observations are restricted to the countries with at least one reported incident of corruption. After collecting these incidents, a state level corruption index was regressed on the reported incidents. For the indices, a more general index, such as the CPI, which through averaging results from multiples surveys captures a general sense of corruption in a given country at a given year, was chosen (See Transperancy.org). For my second index, I chose the World Economic Forum diversion of public funds, which is a more detailed index measuring the diversion of public funds to groups or individuals (See World Economic Forum Global Competitiveness report 2006). The diversion of public funds index is measured on a 0-100 scale, with 100 being free of any diversion of public funds, and 0 the opposite. Corruption of soccer association can come in different shapes. More often, this would be a pocketing of funds from the government, or from a big national company such as an oil company or a telecom giant. The worse a country is in managing public funds through its diversion, the less resources are efficiently directed to the soccer association and thus the development of the sport. There are multiple reasons why this might not be an accurate measurement. Firstly, these reported incidents are of only 7 countries of the 51 observed, and thus might suffer from misrepresentation. Secondly, these only include the reported incidents and not the ones that went unnoticed or unreported in national or international news outlets. Furthermore, after regressing

the number of reported incidents on the chosen indices, the coefficient, although statistically significant, is not big enough (-0.0106) to have a definite impact on actual reported incidents of corruption.

Table 2: Description of variables and their notation in the models

Variable	Notation
National Team performance: ELO ratings	ELOpoints
Population Size	pop
GDP per capita	gdp
A dummy variable for the country's historical colonizer	$\sum$ $DummyColony$: - French - British - Portuguese - Spanish
Diversion of Public Funds	PubDiver
Number of players registered at the Soccer Association of a given country	NumPlayers
A dummy variable representing the region which each team is located in	$\sum$ $DummyRegion$: - North - West - East - South - Central

RESULTS AND DISCUSSION

To analyze the impact of the various variables on performance, I construct a model that examine performance as a function of wealth, talent pool, corruption, colonial heritage, and regional affiliation. The general expected relationship is projected with the sign preceding the variables, hence the negative sign preceding corruption.

$$Performance = Wealth + Talent\ pool - corrupition + Colonial\ heritage + Regional\ affiliation \quad (1)$$

Before delving into the results, a description is given here for the model specification. I use a cross sectional OLS regression test using data from the year 2006. My model specification shows ELO points as a function of a linearized GDP per capita variable (lgdp), a dummy variable representing the different colonial heritage (Assigning a value of 1 if the country belonged to an X colonial heritage and 0 if it didn't), the number of registered players In a given country (NumPlayers), corruption measured through Diversion of public funds index (PubDiver), a dummy variable representing the regional affiliation of a given country Assigning a value of 1 if the country belonged to an X region and 0 if it didn't) and the error term ε_i.

$$ELOpoints_i = \beta_0 + \beta_1 lgdp_i + \beta_2 lgdp2_i + \beta_3 \sum DummyColony_i(french, porto, Brit, Belg, Ita) + \beta_4 NumPlayers_i + \beta_5 PubDiver_i + \beta_3 \sum DummyRegion_i(North, West, East, Central, South) + \varepsilon_i \quad (2)$$

A summary of the variables shows that the average of ELO points of the 51 countries included is 1363.922, with a minimum of 805 and 1780. This would become increasingly important when interpreting the regression results, since we will be able to observe how many points each variable contributes to the ELO points.

To observe the robustness of the results, four regression tests were run, looking at the different variables together and individually. First of all, we can observe a positive relationship between GDP per capita and ELO points. Although the first and the fourth test do not present statistical significance, the 2nd and 3rd tests do so. Specifically, the 3rd model indicates that a 1 percent increase in GDP leads to 7.16 additional ELO points, while the third tests indicate that a 1 percent increase in GDP results in 9.53 additional ELO points. The results confirm the wealth effect from past studies. Past studies have consistently found a positive relationship between the two. More specifically, Royuela and Gasquez (2016) findings on the significance of the impact of GDP per capita on ELO points is reflected here. The wealthier the country is, the better it performs. This can be explained by the increased pool of resources from which a country can invest in its soccer organizations. Furthermore, the squared natural log of GDP per capita

variable confirms the inverted U relationship with performance. This, according to Hoffmann et al. (2002) explains the capital un-intensity nature of soccer. An interpretation of the huge boost an extra percentage increase in GDP per capita has, is the fact that the countries included in the analysis have a bigger return on income growth, since they start at a lower level of income. This can be seen through the U inverted relationship that income has with soccer performance

Table 3: Statistical summary of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ELOpoints	51	1363.922	218.5667	805	1780
GDP	51	1969.976	2894.471	165.8794	12732.03
NumPlayers	51	857247.5	1216713	5860	6344600
PubDiver	40	36.4925	22.04266	2.8	100
French	51	.4509804	.5025426	0	1
Porto	51	.0588235	.2376354	0	1
Brit	51	.3529412	.4826398	0	1
belg	51	.0392157	.1960392	0	1
ita	51	.0196078	.140028	0	1
North	51	.0980392	.3003266	0	1
West	51	.2941176	.460179	0	1
East	51	.1764706	.3850134	0	1
South	51	.2352941	.4284033	0	1
Central	51	.1764706	.3850134	0	1

log of GDP per capita variable confirms the inverted U relationship with performance. This, according to Hoffmann et al. (2002) explains the capital un-intensity nature of soccer. An interpretation of the huge boost an extra percentage increase in GDP per capita has, is the fact that the countries included in the analysis have a bigger return on income growth, since they start at a lower level of income. This can be seen through the U inverted relationship that income has with soccer performance.

The results also indicate that corruption as measured by the World Economic Forum index, diversion of public funds, show no statistically significant impact on ELO ratings. This result can be due to either the inaccuracy of the index in measuring the soccer association corruption incidents, or that corruption does not have an impact on players performance on the field. Either way, the relationship between wealth and performance can potentially explain the

one between corruption and performance, given the observed relationship between economic growth and corruption (Mo, 2001). Furthermore, since I'm focusing on the indirect impact of corruption presented mainly on the players mentality approaching the game, the results might miss the direct impact of corruption on the game, which is reflected by the match fixing incidents. However, that is unlikely since the ELO points put more weight on the official games which are overseen by international or regional bodies and thus less susceptible to match fixing.

The first possibility can be explained through the regression on the relationship between actual incidents of corruption and the diversion of public funds index, which was constructed to justify the use of the index as a proxy for corruption of soccer association. The regression results were not big enough to indicate a strong relationship, albeit its statistical significance. Referring back to the two ways in which corruption might occur in soccer associations, diversion of public funds is meant to measure the incidents related to missing funds and unpaid allowances to players both of which are potentially connected to performance in an indirect manner.

The other explanation is that corruption does not carry much importance when it comes to performing well on the field. Some might argue that players patriotism in representing their country comes first, and whether their promised allowances are given to them or is lost, they would not slack in playing for their country. While this argument might draw attention to what impact performance on the individual player level, it is important to acknowledge the economic importance of practicing the sport for many, not just in Africa, but all over the world.

Finally, colonial heritage and regional affiliation do not generally possess any statistical significance, but vary among regions and areas of different colonial histories. This gives an insight on what is thought to be a regional superiority of excelling in the sport. Although it might seem that countries belonging to west and north Africa perform better than the other regions, on average, no region seem to have an advantage over another.

Table 4: OLS regression results

	(1)	(2)	(3)	(4)
	ELOrating	ELOrating	ELOrating	ELOrating
lgdp	16.41	716.7*	952.7*	504.1
	(23.58)	(297.7)	(392.8)	(298.4)
NumPlayers	0.0000853***	0.0000603**	0.0000670**	0.0000575*
	(0.0000228)	(0.0000201)	(0.0000218)	(0.0000230)
lgdp2		-49.27*	-66.40*	-34.83
		(20.78)	(26.89)	(20.64)
PubDiver		-0.847	-0.160	-0.990
		(1.261)	(1.461)	(1.234)
French			19.26	
			(173.1)	
Porto			-60.65	
			(197.0)	
Brit			-83.28	
			(165.1)	
belg			-8.873	
			(168.7)	
ita			210.1	
			(247.2)	
North				236.0
				(183.6)
West				162.3
				(195.5)
East				38.07
				(200.0)
South				25.14
				(191.3)
Central				135.7
				(205.3)
_cons	1178.6***	-1148.5	-1941.6	-485.5
	(165.4)	(1054.3)	(1321.4)	(1068.9)
N	51	40	40	40
R-sq	0.230	0.362	0.445	0.520
		Standard errors in parentheses		
="* p<0.05	** p<0.01	*** p<0.001"		

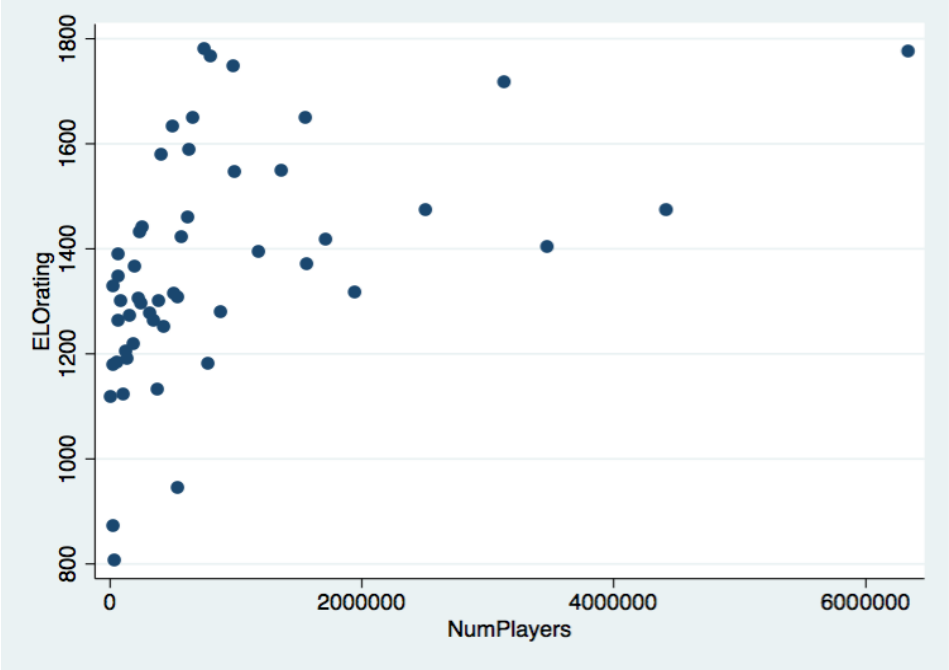

Figure 3: The relationship between number of players and ELO rating

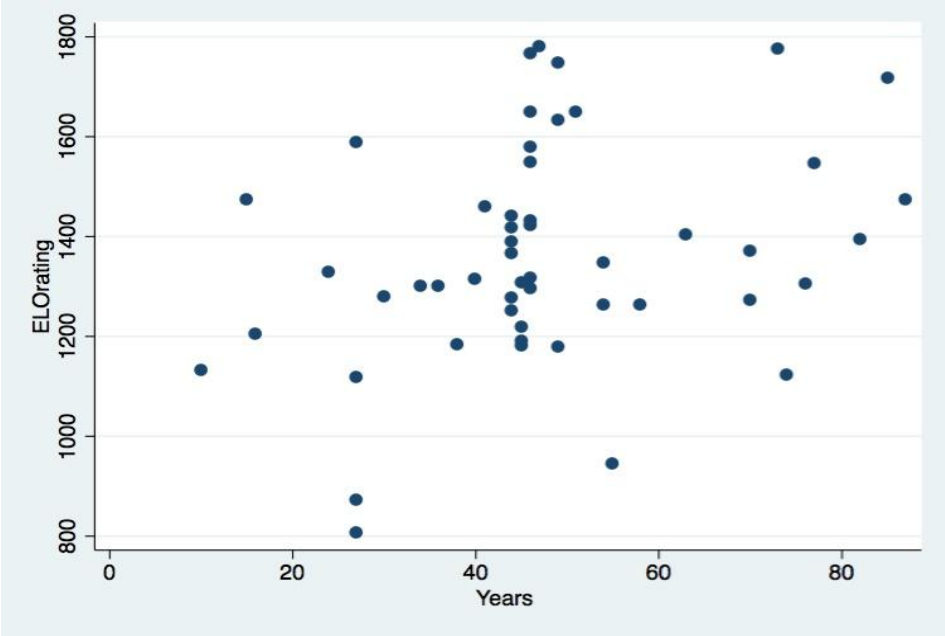

Figure 4. Relationship between number of years since soccer association founded and ELO ratings

CONCLUSION

The results exhibited in this study confirm the previous findings in the literature when it comes to the impact of wealth on performance, but contrary to some studies, size of the talent pool as measured by the number of players in a given soccer association does carry statistical significance. Furthermore, colonial heritage, and regional affiliation do not have a statistically significant impact on performance. Corruption which is the core term for this paper, does not possess any statistical significance in determining performance. However, the relationship between wealth and performance can explain the impact of corruption on performance, since income is usually associated with corruption.

This study informs us of the current state of African soccer and the factors that are important in affecting its performance. Further studies should utilize panel data to better understand not just the overall determinants of performance, but also what explains the trends in performance. The panel data can also increase the sample size and thus provide more accurate estimates. This will become easier as more data become more available on Africa.

The literature is in need for more direct discussion of corruption and soccer in Africa. However, in order to benefit the policy design process, two steps should be taken. First, to further the accuracy of analysis, a measurement of soccer association institutional performance should be established. This will record any irregularities in administration of soccer as well as make soccer association administrators accountable for their actions. Additionally, it will aid the needed analysis of the relationship between soccer and corruption. This leads me to the second step, to come up with a comprehensive model in testing the relationship between corruption and soccer that minimizes statistical issues such as endogeneity.

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