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International Soccer Success and National Institutions

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A growing literature has examined the causes of success in international soccer. We build on this literature by constructing a model of international success, as measured by the number of “Fédération Internationale de Football Association (FIFA) points” a national team has earned and by the resulting rank. We generate testable hypotheses about the impact of a nation’s political regime, colonial heritage, and institutions on its soccer performance. Using ordinary least squares (OLS) and negative binomial regressions, we show that our proxies for these variables affect soccer performance. Specifically, we find that the international success of a country’s club teams positively affects the national team’s success.

Keywords: *soccer; FIFA rankings; institutions*

I. Introduction

A broad literature has arisen about the impact of a nation’s culture on soccer. Contributions have appeared both in the popular press and in more scholarly sources. The best-known popular account, *How Soccer Explains the World* (Foer, 2004), claims that a nation’s soccer teams reflect the particular social and political climate of that country, from the ethnic hatreds of soccer hooligans in the former Yugoslavia to the vague philo-semitism of the followers of Amsterdamsche Football Club (AFC) Ajax in the Netherlands. The growing globalization of the world economy also affects soccer. To be successful, club teams must now look beyond national boundaries for their players. Competitive pressure has thus forced the once fiercely anti-Catholic Glasgow Rangers to employ Catholic players from Italy and Latin America. The

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historical and sociological forces behind Foer's claims are explored in such books as Armstrong and Giulianotti (1999) and Finn and Giulianotti (2000).

Several recent empirical works have examined how a nation's standard of living, institutions, and culture affect the success of a nation's teams in international soccer competition (e.g., Hoffmann, Ging, & Ramasamy, 2002). Foer's (2006) descriptive contribution also lends itself to statistical analysis. Foer suggests that a nation's political structure and history play a role in soccer success. Specifically, he claims that soccer teams from communist regimes can play very well, but they cannot win the World Cup. The most World Cup wins go to social democracies, which he considers the best regime for promoting soccer success. He then lists a series of "iron laws," of which we consider three: first, while colonizers left behind a trail of their sports preferences, their colonies remain weaker: colonizers are likely to defeat their former colonies. England, in particular, is not likely to meet its former colonies in the World Cup because it "planted rugby and cricket more firmly than soccer." Second, oil-producing nations exhibit poor soccer performance, which is a manifestation of the resource curse. Third, primarily within the European Union (EU), a nation without a good domestic league can export its best players and then use them to build a strong national team. This implies that the quality of the domestic league does not necessarily affect a nation's international performance.

We build on this literature in three ways. We begin with an explicit model of how countries produce soccer programs. The model provides a formal structure that guides our choice of variables and interpretation of empirical results. Second, we look more closely at how politics and colonial heritage affect soccer performance, and we quantify and test the claims made by Foer (2006). Third, we stress the role of national institutions in explaining international soccer success. Because we cannot measure the quality of institutions directly, we construct a unique set of proxies. These three contributions make our paper the most comprehensive work in this area.

In the following section, we provide a brief history of Fédération Internationale de Football Association (FIFA), the international body that governs international competition and computes points by which it ranks national teams. A review of the empirical literature on international soccer success follows in section III. We develop and explain our model in section IV, present the results in section V, and conclude in section VI. We find that both income and population have a positive, diminishing effect on success. Formerly communist countries have better teams, but currently communist countries have worse teams. The effect on soccer of having been a colony is weak, but oil-exporting countries have relatively stronger teams. Most importantly, our proxies indicate that national institutions shape international success.

II. FIFA

In 1904, representatives of seven continental European soccer associations met in Paris. They founded the FIFA to set and unify rules for international matches. For

example, FIFA ruled that players could play for only one national team at a time. Five more national associations joined FIFA the following year, including England, which won the matches organized in conjunction with the 1908 and 1912 Olympic Games. The first non-European members to join FIFA were South Africa in 1910, Argentina and Chile in 1912, and the United States in 1913. In 1914, FIFA designated the Olympics as the world soccer championship, but after three successful competitions, it decided to stage its own championship—the World Cup—in 1930. The field grew from the initial 13 countries to 16 in 1934, 24 in 1982, and 32 in 1998. “As of mid-2000, FIFA has grown to include 204 member associations, thus making it one of the biggest and certainly the most popular sports federation in the world” (FIFA, 2007).

Today, FIFA consists of six confederations, one for each continent. One function of the confederations is to organize intracontinental competitions, which we use in our estimation below. Table 1 lists all the confederations, their abbreviations, founding dates, and the number of members. Confederación Sudamericana de Fútbol (CONMEBOL), the first confederation, was founded 12 years after FIFA, on the occasion of the 100th anniversary of Argentinean independence in 1916. The last country to join CONMEBOL was Venezuela, in 1952, two years before the creation of the second and third confederations, AFC in Asia and Union des Associations Européennes de Football (UEFA) in Europe (“Conmebol History,” 2006). The newest confederation was created in Oceania in 1966 after the AFC rejected Australia’s and New Zealand’s application for membership (Dempsey, 2002).

In 1993, FIFA launched a ranking system for its members. The members were ranked by their accumulated points, which were simple 8-year averages of annual performances in “A” matches, which were determined in a complex calculation by the average points per game. In 2005, in response to much criticism of the ranking system, FIFA simplified the calculations. The new ranking method, launched in July 2006, is the sum of the current year performance and a 3-year weighted average of previous annual performances. Annual performance is measured by average points per game, which are determined rather transparently by the following:

- outcome of the match,
- importance of the match,
- strength of the opponent, and
- strength of regional confederation.

See Table 2 for a sample calculation (“The New FIFA/Coca Cola World Ranking,” 2006). We return to the strength of regional confederations in the Results section.

III. Literature

There are at least two ways to quantify international soccer success. One way is to summarize a nation’s success in World Cup competitions over time. Another is to

Table 1
List of FIFA Confederations and Their Leagues

Confederation	Foundation Date	Membership/ Sample
Asian Football Confederation (AFC): Champions League	1954	46/39
Confédération Africaine de Football (CAF): Champions League	1957	53/51
Confederation of North, Central American and Caribbean Association Football (CONCACAF): Champions Cup	1961	40/24
Confederación Sudamericana de Fútbol (CONMEBOL) Copa Toyota Libertadores	1916	10/10
Oceania Football Confederation (OFC): OFC Club Championship	1966	11/7
Union des Associations Européennes de Football (UEFA): Champions League	1954	52/48
Countries not in our sample		
Europe		
Andorra; Faroe Islands; Liechtenstein; San Marino		
Asia		
Iraq; Guam; Macao; Myanmar; North Korea; Palestine; Timor-Leste		
Africa		
Comoros; Somalia		
Central America and Caribbean		
Anguilla; Aruba; Bermuda; British Virgin Islands; Cuba; Cayman Islands; French Guyana; Guadeloupe; Martinique; Montserrat; the Netherlands Antilles; Puerto Rico; Saint-Martin; Sint Maarten; Turks and Caicos Islands; US Virgin Islands		
Oceania		
American Samoa; Cook Islands; New Caledonia; Tahiti		

Notes: <http://www.fifa.com/en/organisation/confederations/index.html>.

explain FIFA points of each nation at one point in time, which is the more common method in the literature. The soccer success literature, in its choice of data and variables, is derivative of the literature that explains Olympic success (see Bernard & Busse, 2004; Johnson & Ali, 2004).

Only three papers have studied the determinants of FIFA points. Hoffmann et al. (2002) examine the performance of 76 countries that won medals at the 2000 Sydney Olympics, as measured by the January 2001 FIFA points. (The authors exclude Scotland, Wales, and Northern Ireland.) They use five independent variables: annual average temperature and gross domestic product (GDP) per capita enter quadratically; GDP per capita also appears linearly. Because the population coefficient is insignificant, the authors multiply it by a dummy that equals one for all Latin countries in Central and South America and Portugal and Spain. Finally, staging the World Cup represents “cultural affinity toward football” and “financial capability.”

Houston and Wilson (2002) apply ordinary least squares (OLS) to 179 countries to explain the June 1999 FIFA points. GDP per capita again enters quadratically.

Table 2
The FIFA Coca-Cola World Ranking

Basic Criteria	Factors for World Ranking
Matches	All international "A" matches
Result	Win—Draw—Defeat (3—1—0 points)
Importance of match	1 (friendly match) to 4 (FIFA World Cup)
Strength of opponent	Position in world ranking (no. 1 = 2.00, no. 30 = 1.70, no. 118 = 0.82, and so on) Formula: $[200 - \text{Position}] / 100$
Regional strength	Based on results in last three FIFA World Cups (wins per confederation per match)
Period assessed	Last 4 years, gradual decline in importance of results: 100%—50%, 30%, and 20%
Number of matches considered per year	Average points gained from all matches in last 12 months (minimum: 5 matches)
Example	Calculation of ranking points for a single match (embedded in a total)
Win	3 points
(a) Points	
Match status	×2.5
Opponents	×1.8
Regional weighting	×1.0
Multiplication factor	×100
Total	1,350
(b) Ranking points total for 12 months	
Match 1	1,350
Match 2	0
Match 3	1,630
Match 4	1,710
Match 5	1,080
Match 6	0
Match 7	530
Average	900
(c) 4-year team total	
Year 1	900
Year 2	760
Year 3	600
Year 4	1200
(d) Weighting of points for each year	
100%	900
50%	380
30%	180
20%	240
Total	1,700

Note: IP590_02E_WRshort.doc_06/07 1/1 on FIFA website.

Population represents the size of the “available talent pool” and enters as a natural logarithm. Years in FIFA capture a nation’s tastes—the popularity of soccer. The number of World Cup appearances represents historical excellence, and the number of appearances in Youth World Cup is a proxy for youth training. All variables, except Years in FIFA, are statistically significant with the expected sign.

Macmillan and Smith (2007) rerun Hoffmann et al. (2002) using a larger sample to reduce the bias inherent in the nonrandomly selected smaller sample. They confirm the earlier results and add a variable that records the year of the first international soccer match in each country, which is equivalent to the foundation year of the national football association. It has a negative and statistically significant effect. Another new variable, a dummy for each former Soviet republic except Russia, has a negative effect, which the authors interpret as the interruption caused by Soviet domination. This interpretation applies only to the Baltic countries, because other former Soviet republics played their first international matches only after the fall of the Soviet empire. The negative impact could reflect a variety of factors, ranging from the inefficient use of resources to preference for other sports. It could also result from omitted variable bias.

The FIFA rankings, despite their recent overhaul, are still criticized on many fronts. For example, some countries might be much more successful in a neighboring confederation. FIFA tries to account for the differences in confederation strength by effectively giving a bonus to countries in what it regards as tougher confederations, but no system can completely offset the impact of geography. Others point to what they regard as the excessive variability of the top teams’ rankings. Macmillan and Smith (2007) claim that the FIFA rankings are unreliable because they include friendly matches, which are not subject to the same incentives as competitive games. They rerun all equations using the Elephant ranking, which excludes friendly matches, but they find that the effect of the independent variables is very similar.

Hoffmann, Ging, Matheson, and Ramasamy (2006) apply their model to women’s FIFA soccer points. They find that only two of their previous variables have a significant impact: linear GDP per capita and hosting of the World Cup. In a separate regression, they find a significant impact of four additional variables: population, men’s FIFA points, a dummy for former and current communist countries, and the ratio of female to male earnings, which they regard as a measure of gender equality.

Torgler (2004) constructs a World Cup Final Tournament Ranking by noting all games a country has won during all World Cup tournaments since their inception in 1930. He counts a victory prior to 1990 as two points and a victory since then as three points. Sixty countries have played in a World Cup and 51 have nonzero rankings; the United States of America, for example, has 16 points. He treats the generated historical averages as a simple cross-country regression, not as a pooled time series and cross-section, and his specification and results are very similar to Hoffmann et al. (2002).

Finally, Milanovic (2003) generalizes Foer’s third law. He develops a model in which increased labor mobility raises inequality in the performance of domestic soccer clubs but lowers the inequality in the performance of national soccer teams.

He uses the model to explain the increasing concentration of teams in the European Champions' League and the disappearance of South Italian teams from the Italian Serie A. On the international scene, the model explains the appearance of more "unheard of" countries in the World Cup and the decreasing goal difference by which elite teams win in the World Cup. Milanovic believes that these effects are caused by the free movement of soccer players following the Bosman ruling and by the restriction that players can represent only one country during their careers in international competition. Because the most talented players can play and practice on the strongest teams, even poor countries without good soccer leagues may produce good national teams.

IV. Model and Data

Starting with North and Davis (1971), economists have recognized the importance of institutions, such as the rule of law, for economic development. Economists have moved from acknowledging the role of institutions to focusing on institutions as the key element for economic growth and development. We apply this general framework to analyze how national institutions matter for international soccer performance.

Our first contribution to the literature lies in modeling success in international soccer matches, S , using a basic production function: $S = f(A, K, L)$. Total factor productivity, A , reflects how well each nation mobilizes its resources, which consist of capital, K , and labor, L . The richness of our model comes from recognizing that total factor productivity is linked to each nation's political regime, history, and soccer institutions. National soccer institutions provide facilities, hire coaches, and train athletes to generate human capital. The quality of institutions, in turn, is linked to the political regime that determines their effectiveness. Foer (2006) claims that fascist regimes, through inspiration, intimidation, and diversion of resources into sports programs, provide an almost ideal climate for soccer excellence. This claim is supported by Martin (2004) who documents Italy's rise to soccer prominence under Mussolini. In summary, we have the following specification:

$$\text{Soccer success} = f\{A(\text{political regime, history, soccer institutions}), K, L\}. \quad (1)$$

Our second contribution lies in estimating how politics and colonial history affect soccer performance and in testing Foer's suggestions and iron laws. Although communist regimes generously subsidized many sports, Foer claims that they stifled "individuality and risk-taking" that are prerequisites for victory. The two opposing forces make the impact of communism on soccer ambiguous. We specify a dummy variable, D_{com} , for current communist countries (Cuba, China, North Korea, and Vietnam) to test what effect communist regimes have on soccer success.

If communist regimes built lasting institutions to support sports, then formerly communist countries—which no longer have the stifling effect on their athletes—should

have relatively stronger soccer teams. We construct a dummy variable, *Dfcom*, for formerly communist countries.¹ If communism has a lingering positive effect on the performance of those countries, then the effect of this variable should be positive, too.

We then formalize Foer's description of how political regimes affect soccer. If political freedom translates into individual freedom and creativity, then freer regimes should exhibit better soccer performance. To characterize a country's political regime, we choose the Freedom House combined average rating (CAR). Freedom House reports two indexes, one for political rights (PR) and one for civil liberties (CL). (The correlation coefficient of the two components is 0.95.) $CAR = (PR + CL)/2$. Freedom House considers countries with a CAR of 1 to 2.5 free (F), CAR of 3 to 5 partly free (PF), and those with a CAR of 5.5 to 7 not free (NF). If freer regimes are better for soccer, we should find a negative association between CAR and soccer success.

The last political factor we examine is whether freedom has a compounding effect on wealth in fostering soccer success. If the democratic spirit is a force that can glow only in the presence of good physical facilities, then the richest democracies should exhibit the greatest soccer success. The richest democracies are members of Organisation for Economic Co-operation and Development (OECD), so we use a dummy, *Doecd*, for a country's membership in OECD. Membership in OECD represents the interaction of freedom and income per capita, which we expect to have a positive impact. (Mexico is the only OECD country with a CAR of 2.)²

Next, we test a variant of Foer's hypothesis that, in soccer, colonizers left only a weak mark on their colonies. Because rugby and cricket became more popular than soccer in British colonies, South Asian countries and Australia now dominate those sports.³ To assess the impact of colonial history, we record the colonial power from which a country obtained its independence after 1900. We choose this date because it roughly coincides with the spread of soccer beyond the United Kingdom. Many countries had several occupying powers, but we take into account only the last one. Because each former colonial power might have had a unique impact on its former colonies, we used a separate dummy variable for each of the major colonial powers—*Dfrance* for France, *Dneth* for the Netherlands, *Dport* for Portugal, and *Duk* for the United Kingdom—all of which were World Cup finalists in 2006. (Only two countries gained independence from Spain after 1900: Cuba and Equatorial Guinea. Because we have no income data for them, we cannot assess the impact of Spanish heritage.) As Germany was stripped of its colonies after World War I, no country gained its independence directly from it. If Foer is right, all the colonial dummies should have a negative effect.

There may be another reason why colonizers are much stronger than their former colonies: the colonizers excel in soccer. To test the hypothesis, we use a corresponding dummy, *Dcp*, for former colonizing powers, England, France, the Netherlands, Spain, and Portugal. If the former colonizers excel in soccer, the dummy variable will have a positive effect.

Foer claims that oil-exporting countries perform poorly at soccer. Resource-driven economies generally have relatively low levels of development; Foer assumes that their citizens get lazy as they expect the riches to flow indefinitely. “[T]hese countries lack a winning temperament and an innovative mindset.” He singles out “Nigeria, Russia, Mexico, Norway, the Gulf states, [and] Iran.” We define the Gulf states as Bahrain, Kuwait, Iraq, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, and we assign a value of one to the dummy variable, *Doil*, for these 12 countries. We also develop a quantitative variable to test the hypothesis of oil influence and discuss it in the results section.

Our third contribution lies in highlighting the role of soccer institutions in generating soccer success. The soccer institutions in each country consist of the national soccer association and private or public soccer clubs and of the resources at their disposal. Because we do not have access to the budgets of any associations or clubs and have no variables that directly measure the quality of the institutions, we need a proxy.

We start by using proxies from the previous studies, hosting the World Cup, *Dhost*, and the length of time a nation’s soccer association has belonged to FIFA, *FIFA-years*.⁴ Both variables reflect the maturity of soccer institutions, which might affect soccer success. We believe that membership in FIFA is a better measure than the date of the first recorded match (used by Macmillan & Smith, 2007) because it captures institutional commitment to soccer better than the date of a single match. Both of these variables could also proxy tastes. Longer membership means that soccer is more ingrained in a country’s culture, and hosting the World Cup signifies a country’s devotion to soccer.

In section II, we described the confederations listed in Table 1. They were founded at different times and represent different numbers of countries with different interests. Thus, these confederations are of different quality as well. We generate a dummy variable for each confederation as a proxy for institutions within each confederation (*Dasia*, *Dafrica*, *Deuro*, *Doceania*, and *Dsam*).⁵ We choose the North American confederation, Confederation of North, Central American and Caribbean Association Football (CONCACAF), as the default.

We next introduce a proxy to reflect the strength of soccer institutions: the success enjoyed by a nation’s club teams in international competition. This variable also represents the strength of the domestic soccer league. According to one of Foer’s “iron laws,” a strong domestic league is not necessary for international success because club teams in the wealthier, largely European, leagues often employ many foreign players who can then form a strong national team in their home country. Milanovic (2003) makes the same claim. In contrast, we believe that internationally successful club teams reflect the country’s commitment to soccer. If a nation’s citizens are interested in soccer and willing to expend resources to develop a successful program for their local club teams, they are also ready to do so for the team that represents their country.

Our proxy is based on the distinction between the club teams and the national team or between domestic and international competitions. Most nations have a domestic league championship for their top club teams. For example, there is the British Premier League, the Serie A in Italy, and the Bundesliga in Germany. Each nation also fields a national team for international competitions, such as the Olympic Games and the World Cup. We base our proxy on “hybrid competitions,” in which club teams from different countries compete against each other in international tournaments.

Each confederation stages its own hybrid championship. We use the number of teams from each country that qualify for this championship as a proxy for the quality of those countries’ soccer institutions. In Europe, the club championship is called the Champions League. After three qualifying rounds, 16 weaker clubs move up to the round of 32 (“group stage”), where they meet the 16 top-ranked European clubs. After a round-robin in eight groups, 16 teams advance to the first knockout round. Because the UEFA tournament spans two calendar years, we use the clubs that competed in the 2005-2006 season. For all other conferences, except for Oceania, we use data from the 2006 season.

In Asia, 15 countries provided teams for the Champions League in 2007, but only 12 countries provided teams during the 2006 season, which is relevant for our study. China, Iran, Iraq, Japan, Korea Republic, Kuwait, Qatar, Saudi Arabia, Syria, United Arab Emirates, Uzbekistan, and Vietnam provided two teams each. This is a small fraction of all Asian teams, but the AFC allows only countries it considers “mature” to play in the League (“Event Information,” 2007).

The South American championship, Copa Toyota Libertadores, honors South American liberators and has been named for its sponsor since 1998. In a brief preliminary round, 12 teams compete for six positions in the group stage of 32; 26 positions are predetermined. In 2006, each South American country and Mexico had at least two teams in the group stage.

There is a smaller group stage in Africa. After a single preliminary round, 32 teams are selected for two successive knockout stages. The remaining eight teams play in a two-group stage with the top two teams in each group moving on to the semifinals.

The Champions Cup of CONCACAF is a smaller tournament than all the preceding ones. The elimination stage is a competition of the Caribbean and Central American teams for four spots; the other four are awarded to the United States and Mexico.

Oceania, the smallest confederation, has a relatively minor tournament, the Oceania Club Championship. After a qualifying tournament, eight clubs remain in the championship; we list the countries represented in the 2005 season, as the 2006 data were not available. In 2007, the championship expanded into a Champions League.

In our regressions, we use the number of teams each country places in both the round of 32 (Africa32, Euro32, and Copa32) and in the quarterfinals (Africa8, Asia8, Euro8, Copa8, Oceania8, and NAMCup8) as proxies for the quality of national

institutions. In Asia, the tournament began with only 24 (expanded to 28 in 2007) teams, so we have Asia24. Both CONCACAF and Oceania report only the number of teams in the quarterfinals.

The remaining variables in Equation (1) are capital and labor. We use GDP per capita to capture the capital-labor ratio in each country because higher output per worker results from more and better capital, and we use total population to represent the size of the labor force. We expect both rising income and population to make a country more successful. To account for diminishing returns to both variables, we take their natural logarithms. We discuss the data for these variables, along with the resulting sample size, below.

Variable definitions appear in Table 3 and variable statistics in Table 4. Using OLS regression, the model becomes

$$\begin{aligned} \text{Points}_i = & \beta_0 + \beta_1 \ln \text{gdpc} + \beta_2 \ln \text{pop} + \beta_3 D_{\text{ecom}} + \beta_4 D_{\text{fcom}} + \beta_5 \text{CAR} + \beta_6 D_{\text{oecd}} \\ & + \sum \gamma_{\text{col}} D_{\text{col}} + \beta_7 D_{\text{oil}} + \beta_8 D_{\text{host}} + \beta_9 \text{FIFAyears} + \sum \delta_{\text{Conf}} D_{\text{Conf}} + \sum \theta_{\text{Champ}} \text{Champ} + \varepsilon_i. \end{aligned} \quad (2)$$

As noted above, FIFA uses accumulated points to rank countries. In addition to using FIFA points to quantify success for each country, as has been done in the literature so far, we also use a country's rank. We recognize that ranking destroys some of the information provided by points: the rank difference between any two consecutive countries is one no matter how much better the higher-ranked team is. But we analyze the nations' ranks using the same variables to confirm the robustness of the above estimates. Because rank is a count variable, the natural functional form is a Poisson regression

$$\begin{aligned} \text{Rank} = & \exp(\beta_0 + \beta_1 \ln \text{gdpc} + \beta_2 \ln \text{pop} + \beta_3 D_{\text{ecom}} + \beta_4 D_{\text{fcom}} + \beta_5 \text{CAR} + \beta_6 D_{\text{oecd}} \\ & + \sum \gamma_{\text{col}} D_{\text{col}} + \beta_7 D_{\text{oil}} + \beta_8 D_{\text{host}} + \beta_9 \text{FIFAyears} + \sum \delta_{\text{Conf}} D_{\text{Conf}} + \sum \theta_{\text{Champ}} \text{Champ}) + \varepsilon_i. \end{aligned} \quad (3)$$

The Poisson regression is based on the assumption that the dependent variable follows a Poisson distribution (Wooldridge, 2002). A basic feature of the Poisson distribution is that the mean equals the variance. Regression results not presented here, however, showed excess dispersion in the rank variable, indicating that the variance of rank exceeded the mean and rendering the Poisson inappropriate. We therefore used a negative binomial regression instead. The functional form of the negative binomial is the same as that of the Poisson, but the negative binomial allows the mean and variance of the dependent variable to differ.

To estimate both equations, we use cross-section data. Points come from the FIFA website (September 2006), and income and population data come from the World

Table 3
Variable Definitions

Dependent variable

Points = FIFA points in September 2006

Capital and laborln_{gdpc} = natural log of 2005 income (IMF: World Economic Outlook)ln_{pop} = natural log of 2005 population (IMF: World Economic Outlook)**Seven variables for political and institutional effects**

CAR = Freedom House combined average rating for 2005

Dccom = 1 for currently communist countries (Cuba, China, North Korea, and Vietnam)

Dfcom = 1 for formerly communist countries (Note 1)

Doecd = 1 for all countries that are members of OECD (Note 2)

Doil = 1 for countries listed by Foer (2006)—see text

Dhost = 1 for countries that have hosted the World Cup (Note 4)

FIFAyears = the number of years since joining FIFA

Five dummy variables for colonization (Dcol)

Dcp = 1 for England, France, the Netherlands, Portugal, and Spain

Dfrance = 1 if a country gained independence from France after 1900

Dneth = 1 if a country gained independence from the Netherlands after 1900

Dport = 1 if a country gained independence from Portugal after 1900

Duk = 1 if a country gained independence from United Kingdom after 1900

Five dummy variables for confederation membership in 2006 (Dconf)

Dafrica = 1 if a country belonged to CAF (Africa)

Dasia = 1 if a country belonged to AFC (Asia)

Deurope = 1 if a country belonged to UEFA (Europe)

Doceania = 1 if a country belonged to OFC (Oceania)

Dsam = 1 if a country belonged to CONMEBOL (South America)

Ten variables for the number of teams in the quarterfinals or in the round of 32 (Champ)

Africa8; Africa32 = the number of teams a country has in the African Champions League

Asia8; Asia24 = the number of teams a country has in the Asian Champions League

Euro8; Euro32 = the number of teams a country has in the European Champions League

Oceania8 = the number of teams a country has in the OFC Club Championship

Copa8; Copa32 = the number of teams a country has in the Copa Toyota Libertadores

NAmCup8 = the number of teams a country has in the Champions Cup

Notes: AFC = Asian Football Confederation; CAF = Confédération Africaine de Football; CAR = combined average rating; CONMEBOL = Confederación Sudamericana de Fútbol; FIFA = Fédération Internationale de Football Association; IMF = International Monetary Fund; OFC = Oceania Football Confederation; UEFA = Union des Associations Européennes de Football.

Economic Outlook Database of International Monetary Fund (IMF, August 2008). Income is GDP per capita in current prices (expressed in dollars). We use 2005 data because they precede the date of the dependent variable.

The United Kingdom has a special standing in FIFA. The United Kingdom comprises four separate associations (England, Northern Ireland, Scotland, and Wales), which were the first four in the world but do not represent independent countries. Thus, international sources, such as the IMF, provide neither income nor population

Table 4
Summary Statistics for Selected Variables

Variable	Mean	<i>SD</i>	Minimum	Maximum
Points	423.49	365.25	0	1574
Ingdpc	8.0374	1.640	4.67	11.30
Inpop	8.7807	1.907	3.91	14.08
CAR	3.208	1.914	1	7
FIFAyears	51.68	28.48	6	102
Africa32 ^a	.174	.485	0	2
Asia24	.124	.483	0	2
Euro32	.180	.665	0	4
Oceania8 ^b	.028	.166	0	1
Copa32	.180	.775	0	6
Africa8	.0449	.233	0	2
Asia8	.0449	.233	0	2
Euro8	.0449	.297	0	3
Copa8	.0449	.297	0	3
NAmCup8	.0449	.278	0	2

Note: CAR = combined average rating.

^a We record only 31 teams, as one is from Zanzibar.

^b We record only five teams, as one is from Caledonia and two are from Tahiti.

for these regions. We used 2005 population figures from National Statistics Online (2006). We obtained 2005 per capita income for the United Kingdom, Northern Ireland, Scotland, and Wales, but not for England, from an EU list of Regional GDP in the European Union ("Regional GDP," 2008). Because England is so much larger than the other regions, we assumed that income for England is the same as for the United Kingdom. For the remaining regions, we computed the ratio of their income to the UK income, and we multiplied UK IMF income by each region's ratio to obtain their 2005 income.

Of the 180 countries surveyed by the IMF, two do not have a soccer association (Kiribati and the United Kingdom), and Comoros has no FIFA ranking. We had excluded Myanmar and Timor-Leste from our initial data set, but added the four UK regions, thus obtaining a sample of 179 countries. Because Freedom House has no rating for Hong Kong, our regression has 178 observations.

V. Results

FIFA Points: OLS

Because we use cross-country data, we checked for heteroskedasticity. We reject the null hypothesis of constant variance at the 1% level. Thus, we ran OLS regression

Table 5
OLS Results

Variable	Quarterfinals		Round of 32	
	Coefficient	<i>t</i> Statistic	Coefficient	<i>t</i> Statistic
lngdpc	41.79	2.97***	39.81	2.73***
lnpop	50.97	3.48***	40.96	2.82***
Dccom	-125.27	-1.99**	-188.55	-2.30**
Dfcom	128.96	1.62	168.50	2.21*
CAR	12.05	1.03	14.18	1.21
Doecd	100.79	1.27	41.49	0.55
Dfrance	83.58	1.35	77.04	1.27
Dneth	-97.62	-2.38**	-81.41	-1.77**
Dport	18.82	0.27	46.52	0.52
Duk	30.98	0.90	64.14	1.80*
Dcp	444.54	4.11***	324.07	2.72***
Doil	185.56	2.52**	136.22	1.67*
Dhost	218.38	2.71***	191.51	2.53**
FIFAyears	0.73	0.67	1.33	1.21
Dafrika	30.40	0.57	-4.21	-0.08
Dasia	-187.97	-3.09***	-186.61	-3.18***
Deurope	115.21	1.44	87.51	1.14
Doceania	-148.09	-1.74*	-175.53	-1.94*
Dsam	264.65	2.85***		
Africa8—Africa32	266.21	3.87***	147.52	3.49***
Asia8—Asia24	16.82	0.45	59.60	2.05**
Euro8—Euro32	117.26	1.61	127.23	3.28***
Oceania8	104.39	0.88	150.97	1.21
Copa8—Copa32	215.41	4.26***	145.02	5.92***
NAmCup8	1.00	0.01	13.06	0.17
Constant	-574.50	-3.41***	-528.03	-3.13***

Notes: CAR = combined average rating; OLS = ordinary least squares.

$n = 178$; $F = 43.25$, $R^2 = .7605$; $F = 27.00$, $R^2 = .7605$.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

in STATA with robust standard errors that are corrected for the bias resulting from heteroskedasticity. Table 5 contains two sets of estimates of Equation (2). In the left coefficient column, the Champ variable is the number of teams from each country that qualify for the quarterfinals in each confederation; in the right coefficient column, the Champ variable is the number of teams from each country that qualify for the round of 32 in each confederation. The *t* statistics for each appear in the adjacent columns.

Half the coefficients in the left column have a significant effect with the expected sign. As in previous studies, income and population raise FIFA points. A one-unit

increase in the natural log of income adds about 42 points, and a one-unit increase in the natural log of population adds 51 points. At the mean value of the natural log of income of 8.046 (see Table 4), a unit increase translates into \$5,363, which means that an extra \$1,000 generates 7.8 points. Analogously, at the mean value of the natural log of population of 8.757, a unit increase represents 10.920 million people. A country with one million more people than an otherwise identical country gains 4.6 points.

Although communist regimes used to support sports in general and soccer in particular, we find that the four remaining communist countries have 125 fewer points than other countries. This statistically significant negative impact could reflect a combination of doctrinal communism and low interest in soccer, as well as the lack of individualism in the four countries. Formerly communist countries, in contrast, have more points; this effect is marginally significant. Our result contradicts Macmillan and Smith (2007), who find a strong negative effect for former Soviet Republics. We interpret the positive impact as indicating that the institutions that the communist built, or good institutions that they did not dismantle, continue to promote the practice of soccer.

The effect of an additional point on the CAR scale is small and statistically insignificant, which indicates that freedom by itself does not affect soccer success. In a separate regression not shown here, we replaced the CAR variable with a dummy of one for countries whose CAR was one and zero for the others, but the dummy was still insignificant. The effect of OECD membership is also insignificant, which means that freedom does not have a compounding effect on wealth and that OECD countries do not enjoy a special advantage in soccer.

We find that the impact of colonial heritage as captured by the country dummies is generally insignificant. Only the countries that gained independence from the Netherlands (after 1900) perform more poorly, which can be explained by their small numbers. This effect is a result of only three countries' gaining independence from the Netherlands in the 20th century: Indonesia, Netherlands Antilles, and Surinam. Netherlands Antilles is not in our sample, and both Indonesia and Surinam have weak national teams. Indonesia has 131 points, while Suriname has 72 points and is ranked 163. This general insignificance of the effects indicates that the colonies are normal performers in soccer, which provides weak evidence for Foer's claim that the colonizers did not imbue their colonies with an appreciation for soccer.

The dominance of former colonists in soccer is confirmed by the effect of the five-country dummy, *Dcp*: England, France, the Netherlands, Portugal, and Spain have, *ceteris paribus*, 445 more points than other countries. This effect is highly statistically significant. This is not conclusive evidence that colonizers perform better than their colonies, but it is consistent with the hypothesis.

Because being an empire does not directly explain excellence in soccer, we also ran the equation without this dummy. The results are qualitatively unchanged—only two variables switch significance. The effect of former communism, which was marginally significant, is now insignificant. But the influence of the European

association dummy is significant at the 10% level and the effect of placing a team in the European quarterfinals is significant at the 1% level.

Our data do not support Foer's hypothesis that oil-exporting countries perform poorly in soccer. The oil dummy for the 12 states that he lists has a significant effect, adding 186 points. This indicates either that these oil-rich countries provide much financial support for soccer or that the oil-induced malaise does not filter down to soccer participation. We tried to generalize the effect of oil exports by computing the percentage of fuel exports in a country's GDP (following Ross, 2001), but the impact was statistically insignificant.

Turning to the institutional factors that are the focus of this article, we start with the two variables that have appeared in the literature, hosting the World Cup and the number of years the country's soccer association has belonged to FIFA. We find that the length of time in FIFA has an insignificant effect (which is consistent with Houston & Wilson, 2002), but the effect of hosting the World Cup is significant. Having hosted a World Cup adds about 218 points to a country's FIFA score. The effect of these two variables indicates that participation alone does not breed excellence; the deeper commitment and leadership exhibited by hosting the Cup is associated with superior performance.

The confederation dummies have the effect that soccer aficionados would expect. In part, this is caused by the construction of the point system. As seen in Table 2, matches in different confederations carry different weights. The European confederation is the strongest, so its points enter in full. South American points are multiplied by 0.98 and all other confederations points are multiplied by 0.85.

The effect of the European confederation is only marginally statistically significant because of the presence of the colonizer dummy of England, France, the Netherlands, Portugal, and Spain, as indicated above. The colonizer dummy weakens the overall European impact, which is 115 points, but the residual influence of the European confederation dummy attests to the strength of UEFA. Even after removing four of the strongest European powers (England, France, Spain, and the Netherlands), the impact of the European confederation is large and almost significant.

The effect of Africa is not statistically significant, which means that the African confederation is not different from CONCACAF. Countries in the Asian confederation have 188 fewer points than in North America and countries in Oceania (from which we have excluded Australia) have 148 fewer points. Countries in CONMEBOL have 265 more points. This large effect is strongly significant and confirms the preeminence of the South American teams. We interpret these point differences as representing the impact of the institutional structure on the typical country in each confederation.

The impact of placing a club in the confederation championship quarterfinals has a different impact across confederations. The quarterfinals in three confederations, Asia, Oceania, and North America, have no impact. The insignificance of making the

AFC's quarterfinals might be due to the structure of the tournament itself. The brackets for 2006 kept Middle Eastern teams away from East Asian teams until the quarterfinals. The brackets might reflect the transportation costs of sending teams from Japan to Saudi Arabia, for example. Alternatively, they might reflect political desire to keep the quarterfinals from being dominated by East Asian teams. Whatever the reason, the East Asian teams that make the quarterfinals are typically stronger than the Middle Eastern teams they play. Thus, making the quarterfinals might not be as meaningful for the AFC as it is for other confederations. Placing an additional team in the quarterfinals adds 266 points to a country in Confédération Africaine de Football (CAF), 117 points to a country in UEFA, and 215 points in CONMEBOL.

We rerun Equation (2) with the number of teams a country places in the round of 32. Because there is no round of 32 in Oceania or North America, we use the number of teams a country places in the quarterfinals for Champ. We leave the South American dummy out of the equation because each country has at least two teams in the championship. Thus, the team effect already accounts for the confederation effect.

We generally confirm the above results, and four more coefficients become significant. First, countries that have gained their independence from the United Kingdom now have statistically more points—64, which suggests that the United Kingdom had a positive impact on its colonies, even in soccer. Second, placing a team in the Asian round of 24 also has a significant impact—it adds 60 points. This confirms the criteria used to select teams for this round. Moreover, the effect of former communism is now statistically significant, as is the effect of placing a team in the European 32. The latter adds 127 points—despite the fact that we have already accounted for the effect of the five colonists. Thus, the institutional effect is strong. Both the confederation and the domestic league help determine the international success of national teams.

Our specifications, which are more detailed than in the previous literature, fit the data very well. The Wald statistics indicate that the equations are statistically significant at the 1% level of significance. The statistic for the quarterfinals equation, however, is much greater than for the round of 32. The robust estimate of OLS does not report the adjusted R^2 , but the R^2 is .7605 in both regressions.

FIFA Rank: Negative Binomial

In Table 6, we report the results of estimating Equation (3) with the same two sets of variables we used for the OLS. The left coefficient column again presents the estimates with the number of teams from each country that qualify for the quarterfinals; the right coefficient column has the estimates for the round of 32 in each confederation (except for Oceania and North America). The results are broadly similar to the OLS equations, which confirms the robustness of our specification. Half of our variables have statistically significant impacts.

Table 6
Negative Binomial Results

Variable	Quarterfinals		Round of 32	
	Coefficient	<i>t</i> Statistic	Coefficient	<i>t</i> Statistic
lngdpc	-.079	-2.79***	-.080	-2.61***
lnpop	-.109	-3.56***	-.092	-3.20***
Dccom	.216	2.04**	.469	2.62***
Dfcom	-.394	-2.56***	-.489	-3.26***
CAR	-.015	-0.61	-.017	-0.70
Doecd	-.240	-1.59	-.111	-0.76
Dfrance	-.109	-0.93	-.145	-1.28
Dneth	.153	1.90*	.081	0.96
Dport	-.040	-0.27	-.088	-0.48
Duk	-.121	-1.65*	-.209	-2.77***
Dcp	-1.54	-4.13***	-1.28	-2.89***
Doil	-.443	-3.13***	-.304	-1.88*
Dhost	-.176	-0.52	-.115	-0.34
FIFAyears	-.002	-0.78	-.002	-1.08
Dafrica	-.103	-0.98	-.053	-0.51
Dasia	.368	2.99***	.357	3.01***
Deurope	-.150	-0.94	-.113	-0.71
Doceania	.286	1.59	.317	1.66*
Dsam	-.693	-3.06***		
Africa8—Africa32	-.624	-3.43***	-.293	-3.13***
Asia8—Asia24	-.156	-1.59	-.213	-2.88***
Euro8—Euro32	-.447	-1.61	-.354	-2.50***
Oceania8	-.149	-0.59	-.245	-0.95
Copa8—Copa32	-.857	-4.60***	-.454	-5.11***
NAmCup8	-.158	-1.05	-.200	-1.28
Constant	6.437	18.65***	6.413	17.85***

CAR = combined average rating.

Note: $n = 178$; $\chi^2 = 1095.66$; $\chi^2 = 481.34$.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

The political and economic variables have a similar impact as in Table 5. Currently communist countries have a lower (worse) rank, but formerly communist countries have a higher (better) rank. The impacts of freedom and of belonging to OECD remain insignificant.

The effect of having gained independence from France and Portugal remains insignificant, but the impacts of the Netherlands and United Kingdom change in different directions. The negative effect of the Dutch heritage weakens, as it now has a significant impact in only one equation, but the positive effect of British heritage

grows. It is significant in both equations, thus indicating that their British soccer heritage “has rubbed off.”

Oil exporters have better rank in soccer performance, which confirms our OLS result and refutes Foer’s hypothesis that oil-producing countries perform worse in soccer. But the effect of the host dummy becomes completely insignificant, which indicates that the some of the effect of having hosted the cup may have dissipated over time.

The remaining dummy variables account for the effect of each confederation, so we can separate the confederation effect from a country’s playing in its own champions league. The effect of these variables is virtually the same as in the OLS version. UEFA membership again has an insignificant effect, which indicates that the other factors that we have used account for the rank of European countries.

Playing in the quarterfinals and in the round of 32 has the same effect as in the OLS version. In the quarterfinals, the effect is again strongly significant in Africa and in South America, marginally significant in Europe and in Asia, and insignificant in Oceania and North America; in the round of 32, the effect is again significant in the four strongest confederations. We interpret the results as showing that the willingness and ability to create strong private soccer institutions improve the national soccer team.

Both regressions are statistically significant at the 1% level. Analogous to the OLS results, the chi-square for the regression using the quarterfinal variables is far greater than for the round of 32.

VI. Conclusion

Our study uses a production function framework to examine political, historical, and institutional factors that affect countries’ success in international soccer. We confirm the central findings of previous work and build on this literature to provide new insights into what factors lead some nations to perform at a higher level than others. In so doing, we test three of Foer’s claims regarding soccer success.

The basic insight of the soccer literature, which it shares with research on Olympic success, is that it helps to be big and rich. All else equal, countries with larger populations and higher GDP per capita outperform less populous and poorer countries. Our findings strongly confirm this basic result.

We find some evidence that a country’s political structure affects its international soccer performance. Current communist regimes, a small idiosyncratic group, do not perform as well as noncommunist regimes, perhaps because soccer is no longer a political or an athletic priority. Former communist countries perform better, which reflects synergy between old support for soccer and new-found freedom. Our results for CAR suggest, however, that the degree of freedom alone has no direct impact on soccer performance. When we test for the interaction of freedom and wealth, the results are insignificant.

We find some support for only one of Foer's "iron laws." Foer observes that former colonies have difficulty defeating their former colonizers. The FIFA point evidence suggests that this result reflects the strength of the colonizer rather than any weakness among the colonized. Only former Dutch colonies (of which there are two in our sample) underperform, *ceteris paribus*. In contrast, our results weakly indicate that former British colonies, despite their devotion to cricket and rugby, overachieve in soccer.

Contrary to Foer's claim, we find that oil production helps countries' soccer performance. The average number of FIFA points for countries that Foer identifies as oil producers (570) exceeds that of nonoil producers (400). More importantly, our results show that oil producers outperform nonproducers by a similar margin, even when holding other factors constant.

Recently, international soccer competition has experienced a more level playing field. The strongholds now work harder for their victories, but our results show that they remain victorious. Except in Oceania and North America, countries that have good leagues, as measured by the success in international club tournaments, also have stronger national teams.

This last result is particularly important because it is the one policy instrument that countries are likely to use to improve soccer performance. Countries cannot readily become large or rich, and finding large oil deposits depends more on natural endowments than it does on government sports policy. When countries contemplate how best to advance in international soccer rankings, they should not be afraid to import players for their domestic league. They should increase public funding or seek private sponsorship for the domestic league because the stronger the structure and performance of the domestic league, the greater the country's international success. Investing in domestic soccer leagues is the one avenue open to countries that wish to improve on the international stage.

Notes

1. Formerly communist countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Romania, Russia, Serbia and Montenegro, Slovak Republic, Slovenia, Ukraine, and Uzbekistan.

2. OECD countries: Australia, Austria Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States of America.

3. Former British colonies have dominated both rugby and cricket. Since 1987, Australia (2), South Africa (2), and New Zealand (1) have accounted for five of the six Rugby World cups; England won the sixth. In cricket, Australia has won four of the six World Cups since 1987, while Pakistan and Sri Lanka won the two others.

4. Argentina, Brazil, Chile, England, France, Germany, Italy, Japan, Korea, Mexico, Spain, Sweden, Switzerland, United States of America, and Uruguay have all hosted the World Cup.

5. Although most countries in each confederation are from the continent of the confederation, there are three exceptions. Israel and Kazakhstan are both members of the European confederation. Australia played in two confederations, AFC and Oceania Football Confederation (OFC), in 2005, but left the Oceania for the Asian confederation in 2006. Although Mexico is not a member of CONMEBOL, it now plays in Copa Toyota Libertadores, in addition to the CONCACAF Cup.

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