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International Soccer Success and National Institutions

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Abstract

A growing literature has examined the characteristics that lead countries to succeed in international soccer. We build on this literature by constructing a model of international success, where we measure success by the number of "FIFA points" a national team has earned. From this model we generate testable hypotheses regarding the impact of a nation's political regime, colonial heritage, and institutions on its soccer performance. Using OLS and Poisson regressions, we corroborate previous results and find that success increases with income, population, and having hosted a World Cup competition. We also find that a country's colonial heritage and political and soccer institutions affect its soccer performance. In particular, the international success of a country's club teams is a good predictor of the national team's success.

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

Recently, several empirical works have examined how a nation's standard of living, institutions, and tastes affect the relative success of its national teams in international soccer competition (e.g., Hoffmann et al., 2002). Foer's (2006) descriptive contribution also lends itself to statistical analysis. Foer suggests that a nation's political structure and history plays a role in soccer success. Specifically, he claims that soccer teams from fascist and communist regimes perform differently from teams from social democracies: they can play very well, but they cannot win the World Cup. The most World Cup wins go to social democracies, which he thus considers the best regime for 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 forever weaker: colonizers are likely to defeat their former colonies. England, in particular, is not likely to meet its former colonies in a soccer tournament because it "planted rugby and cricket more firmly than soccer." Second, primarily within the 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 success of the domestic league does not affect a nation's international performance. Third, oil-producing nations exhibit poor soccer performance—this is an additional manifestation of the oil curse.

We build on this literature in four ways. We begin with an explicit model of how countries produce soccer programs. The model provides a formal structure that guides our estimation, 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. Fourth, we apply two different estimation techniques. These four contributions make our paper the most comprehensive work in this area so far.

In the following section, we provide a brief history of FIFA, the international body that governs international competition and computes points by which it ranks national teams.

We use FIFA points to define international soccer success. A review of the empirical literature on international soccer success follows in section three. We develop and explain our model in section four, and we present our results in section five. We find that both income and population have a positive, diminishing effect on success and that OECD members, which are predominantly social democracies, accumulate more points. The effect of colonial heritage is mixed, but oil-exporting countries do not have relatively weaker teams. Having hosted the World Cup is an excellent indicator of soccer success. Our proxies indicate that national institutions shape international success. Section six is a conclusion.

II. FIFA

In 1904, representatives of seven continental European soccer associations met in Paris. They founded the Fédération Internationale de Football Association (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 decided that the Olympic competition would serve as the world soccer championship, but after three successful competitions, it reversed itself and decided to stage its own championship—the World Cup—in 1930. The size of the field grew from the initial 13 countries to 16 in 1934, 24 in 1982, and 32 countries 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 is comprised of six confederations, two for the Americas and one each for the remaining continents. One function of the confederations is to organize intracontinental competitions, which we use in our estimations below. Table I lists all the confederations, their abbreviations, founding dates, and the number of members. CONMEBOL, the first confederation, was founded 12 years after FIFA, on the occasion of the 100th anniversary of Argentinean independence in 1916. Four countries fielded teams for a championship and started the confederation. 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 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 eight-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 three-year weighted average of previous annual performances. The annual performance is measured by average points per game, which are determined rather transparently by the

- outcome of the match
- importance of the match
- strength of the opponent
- strength of regional confederation

See Table II 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 explain FIFA points of each nation at one point in time, which is the more common method in the literature. The soccer success literature is derivative of the literature that explains Olympic success. (See Bernard and Busse (2004) and Johnson and Ali (2000).)

Only two 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 GDP per capita enter quadratically; GDP per capita also appears linearly. Because the population variable 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, the staging of the World Cup represents "cultural affinity toward football" and "financial capability." The equation has a relatively low adjusted R^2 of 0.3180.

Houston and Wilson (2002) apply OLS to 179 countries to explain the June 1999 FIFA points. GDP per capita again enters quadratically. 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. The adjusted R^2 is 0.5179.

Hoffman et al. (2006) expand their study 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 is a measure of gender equality. The adjusted R^2 is 0.667.

In a related paper, 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. A victory prior to 1990 enters as two points and a victory since then as three points (no justification provided). Sixty countries have played in a World Cup and 51 have nonzero rankings; the USA, for example, has 16 points. He treats the

generated historical averages as a simple cross-country regression, not as a panel, and his specification and results are very similar to Hoffman et al. (2002).

IV. Model and Data

Starting with North (e.g., 1971), economists have recognized the importance of institutions, such as the rule of law, for economic development. Economists have moved from recognizing 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, as generated by 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, tastes, 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. The popularity of soccer remains to some extent a result of historical accident. Once established, the popularity of soccer--and the popularity of sport in general--brings more players into the fold and thus leads to more success. In summary, we have the following specification:

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

Our second contribution lies in estimating how politics and colonial history affect 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). 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 CAR of 5.5 to 7 not free (NF). If authoritarian regimes are less free and better for soccer, we should find a positive association between CAR and soccer success. In addition, we specify a dummy for former or current communist countries to account for state and private support of soccer. The communist regimes are recognized for supporting non-revenue generating sports. Finally, we use a dummy for a country's membership in the OECD. Since OECD countries are the most developed nations and are all democracies (Mexico being the only arguable one), the dummy variable reflects a combination of economic and political forces. It can also be interpreted as a proxy for what Foer (2006) calls "social democracies." We expect this variable to raise soccer success.

We test a variant of Foer's hypothesis that colonizers left only a weak mark on their colonies. 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 a series of 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 (France, the Netherlands, Portugal, Spain, and the United Kingdom, all of which were World Cup finalists in 2006). As Germany was stripped of its colonies after World War I, no country gained its independence directly from it. These variables also include quasi-nations, such as the Netherlands Antilles, that are not fully independent but have their own soccer federations.

To account for tastes, we use the length of time in FIFA. We assume that the longer the membership in FIFA, the more ingrained soccer becomes in a country's culture and the more success it will enjoy. We also include the hosting of the World Cup, which is a variable used in the literature to proxy both tastes and institutions. We assume that hosting the World Cup signifies a country's devotion to soccer and improves its success. We also use these variables as proxies for institutions—see below.

We use GDP per capita to capture the capital-labor ratio in each country, and we use total population to represent the size of the appropriate labor force. To account for diminishing returns to both variables, we take the natural log of both variables. We expect both rising income and population to make a country more successful.

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 (and/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 would directly measure the quality of the institutions, we need a proxy.

First, we use the proxies that previous studies have used, the length of time a nation's soccer association has belonged to FIFA and hosting the World Cup. Longer affiliation with FIFA and hosting the World Cup both reflect more mature soccer institutions, which bring greater soccer success. Foer claims that oil-exporting countries will have poorer soccer institutions. We denote the top 17 countries from Ross's (2001) list in his Table 1 as oil exporting nations and test his hypothesis. The ratio of oil exports to GDP for the countries we select exceeds 10%.

Second, we introduce a new proxy that we believe reflects the strength of soccer institutions, the success enjoyed by a nation's club teams in international competition. 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. Alternatively, 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 club teams and the national team, or between domestic and international competitions. Most nations have a league championship for their top club teams; these are domestic competitions. 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 or play in international tournaments.

In Section II, we described the six confederations listed in Table I. While 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, and Australia appears in two confederations. While Mexico is not a member of CONMEBOL, it now plays in Copa Toyota Libertadores, in addition to the CONCACAF Cup.

Each confederation stages its own hybrid championship. We assume that the number of teams from each country that qualify for this championship is a result of the soccer institutions of each country and that it can be used as a proxy for the quality of those institutions. In Europe, the club championship is called the Champions League. After three qualifying rounds, in which the weakest teams play first, sixteen clubs move up to the round of 32 ("group stage"), where they meet the 16 top-ranked European clubs. After a round-robin in 8 groups, 16 teams advance to the first knock-out round. 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, fifteen countries have provided teams for the Champions League in the 2007 competitions, but only twelve 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, twelve teams compete for six positions in the group stage of 32; 26 positions are predetermined. In 2006, each country in South America 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 knock-out stages. The remaining eight teams play in a two-group stage. The Champion's 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, as the other four are awarded to the US 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. This Championship has been expanded into a Champions League starting with the 2007 season.

In our regressions, we use the number of teams each country places in both the round of 32 and in the quarterfinals. In Asia, we do not have 32 teams, as the tournament began with only 24 (expanded to 28 in 2007). Both in CONCACAF and in Oceania, we have only the number of teams in the quarterfinals.

Variable definitions appear in Table III and variable statistics in Table IV.

Using OLS regression, the model becomes:

$$Points_i = \beta_1 + \beta_2\, lngdpc + \beta_3\, lnpop + \beta_4\, FIFAyears + \beta_5\, CAR + \beta_6\, D_{com} + \beta_7\, D_{oecd} +$$

$$\beta_8\, D_{host} + \beta_9\, D_{oil} + \Sigma\, \gamma_{col}\, D_{colonizer} + \Sigma\, \delta_{Conf}\, D_{Conf} + \Sigma\, \theta_{Champ}\, Champ + \varepsilon_i, \qquad (2)$$

Our fourth contribution to the literature lies in using an additional estimation technique. Because points is an integer and violates the assumption of normal error distribution, OLS is not the best estimation method. Our last improvement is the application of the Poisson estimation. Using the Poisson regression, the model becomes:

$$Points = \exp(\beta_1 + \beta_2\, lngdpc + \beta_3\, lnpop + \beta_4\, FIFAyears + \beta_5\, CAR + \beta_6\, D_{com} + \beta_7\, D_{oecd} +$$

$$\beta_8\, D_{host} + \beta_9\, D_{oil} + \Sigma\, \gamma_{col}\, D_{colonizer} + \Sigma\, \delta_{Conf}\, D_{Conf} + \Sigma\, \theta_{Champ}\, Champ) + \varepsilon_i, \qquad (3)$$

To estimate both equations, we use cross section data for the year 2006, except where noted below. Points come from the FIFA's website (September 2006), and income and population come from the Penn World Tables. We use income and population data from 2003 because that is the most recent year for which data for most countries are available.

Of the 188 countries surveyed by the Penn World Tables (PWT), four do not have a soccer association (Kiribati, Micronesia, Palau, and the United Kingdom) and Comoros has no FIFA ranking. The UK has four separate associations, which were the first four in the world: England, Northern Ireland, Scotland, and Wales. (PWT provides neither income nor population for these regions. We got the population figures from The Intute Consortium (2006). We obtained 2002 income for the UK, Northern Ireland, Scotland, and Wales, but not for England, from an EU list of regional incomes ("Regional GDP," 2002). We assumed that income for England is the same as for the UK, and we used the UK PWT data for it. For the remaining regions, we computed the ratio of their income to the UK income, and we multiplied each region's ratio by the UK PWT income and used the resulting figure as their 2003 income.) Thus, there are 187 potential FIFA members in our sample (Australia is now a member of both the Asian and Oceanic Conference). Since the Penn World Table does not have 2003 income figures for six countries, we

have only 181 observations in our OLS regression. Freedom House has no rating for Bermuda, Hong Kong, and Macao, so the Poisson regression has only 178 observations.

V. Results

Although we believe that the Poisson specification is more appropriate because points are a count variable (Wooldridge, 2002), we present the results of both equations (2) and (3) because they complement each other. We start with the OLS results because of their simplicity and ease of interpretation. We conclude that the variables that have a statistically significant effect in both specifications are very robust. To reconcile the two sets of estimates, we compute and report below the marginal effects of the variables that are significant in both specifications, as well as the marginal effects of all of the quarterfinal proxies. The marginal effects are similar, which means that the two specifications reinforce one another.

OLS: FIFA Points

Table V contains two sets of estimates of equation (2). The first column lists the estimates that result from using the number of teams from each country that qualify for the quarterfinals in each conference as an explanatory variable. We explain these results below and note when they deviate qualitatively from the second column, which lists the estimates that result from the number of teams each country has in the round of 32.

Many variables have a significant effect with the expected sign of the coefficients. As in previous studies, income and population raise FIFA points. Their effects are almost identical: A unit increase in the natural log of income adds about 52 points and a unit increase in the natural log of population adds 54.64 points. At the mean value of the natural log of income (8.62--see Table IV), a unit increase translates into $9,427 dollars, which means that an extra $1,000 generates 5.51 points. Analogously, at the mean population value of 8.65, a unit increase represents 9.812 million people. A country with one million more people than an otherwise identical country gains only 5.57 points. (We record the marginal impacts in Table VII.)

Members of OECD have 110 more points than other countries, which confirms Foer's hypothesis that social democracies are best for soccer. (This effect is significant only in the quarterfinal equation.) Neither communist heritage nor the current state of freedom has a significant impact on points, so we drop them from the OLS regression.

We use two variables that have a positive impact in two different papers reviewed above: hosting the World Cup and the length of time the country's soccer association has belonged to FIFA. In our specification, the effect of the number of years in FIFA is not significant, but the effect of hosting the World Cup is. Having hosted a World Cup adds about 216 points.

Our data do not support Foer's hypothesis that oil-exporting countries perform poorly in soccer. The oil dummy has a positive, significant effect in the quarterfinal equation (it

adds 129 points) and a statistically insignificant effect in the other equation. While oil-exporting countries are not strong soccer performers, the other independent variables in the regression already account for that fact.

We find that the impact of colonial heritage is insignificant in the OLS regression, and so we leave the colonial dummies out. At first glance, it is surprising that the birthplace of soccer does not have a more pronounced impact. But the insignificance of the UK dummy is consistent with Foer's claim that the British spread the love of other sports in their colonies.

The set of confederation dummies has the effects that soccer aficionados would expect. In part, this is caused by the construction of the ranking system. As seen in Table II, matches in different confederations carry different weights. The European confederation is the strongest, and so its points enter in full. South American points are multiplied by 0.98 and all other confederations points by 0.85. We account for Europe, Asia, Africa, and South America with confederation dummies; we choose the North American confederation, CONCACAF, as default. (Oceania is not significant and does not appear in Table V.)

Countries in the European confederation have 254.56 more points than countries in CONCACAF, and the countries that qualify for the Champions League have an additional 210.75 points per qualifying team. Countries in South America have 277.84 more points than countries in CONCACAF, and the countries that qualify for the Copa Toyota Libertadores have an additional 233 points per qualifying team. We leave the South American dummy out of the broader equation because each country has at least two teams in the championship and thus the team effect already includes and accounts for the country effect. African conference countries have 96.34 more points than countries in CONCACAF (with very weak significance), but a team in the African quarterfinals adds 260 points. Having an additional team in the CONCACAF Champions Cup has no significant impact on points.

Countries in the Asian conference have 122.24 fewer points, but appearing in the Champions League has no effect. 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 desires to keep the quarterfinals from being dominated by East Asian teams. Whatever the reason, the East Asian teams that make the quarterfinals are typically much 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.

Our more detailed specification results in a good overall fit of the regression. The adjusted R^2 of 0.7 is much larger than those of previous alternative specifications.

Poisson: FIFA Points

In the Poisson regression, all our variables have statistically significant impacts. In Table VI, we report the results with the number of teams from each country that qualify for the quarterfinals in each conference. The equation with the number of countries that advance to the group of 32 has very similar the results, but we report the quarterfinals because we have consistent data across the six confederations. The results confirm that countries with higher income and population have more FIFA points. Since we use the natural logarithms of income and population, their coefficients are FIFA-point elasticities. The income elasticity is 0.17 and the population elasticity is 0.15. The marginal impact of income at the sample means of points (411) and income (5486) is 12.78 points per $1000. The marginal impact of population at the sample means of points (411) and population (5710) is 11.10 points per 1 million people.

The effect of an additional point on the CAR scale (increasing autocracy) raises a country's points by only 1 percent. OECD and communist status have a larger effect, as they increase points by 22 and 16 percent, respectively. This implies that OECD countries and former and currently communist countries choose to support soccer beyond what their incomes and populations dictate. The effect of OECD membership is larger than the communist effect at close to 5% level of significance, so it is better to be rich and free. Formerly communist countries that have become OECD members enjoy the benefit of both effects. The marginal effect of being an OECD country at the sample mean of 411 points is about 90 points, which is rather close to the OLS marginal estimate of 110 points (see Table VII).

In the Poisson regression, both hosting the World Cup and the number of years in FIFA have a significant impact and raise a country's points by 16 and 0.2 percent, respectively. These variables represent enthusiasm for soccer, maturity of soccer institutions, and the willingness and ability to fund soccer tournaments, all of which improve performance. For many countries, for example the Baltic states, the soccer institutions are much older than the countries themselves. The marginal impact of hosting the Word Cup, computed at the sample mean of 411 points, is 67.34, somewhat less than the OLS impact.

Oil-exporting countries have 25 percent more points than other countries, which refutes Foer's hypothesis that oil-producing countries perform worse in soccer. The marginal impact of this variable, again at the sample mean, is 103. 25, which is very close to the OLS estimate.

A country's immediate colonial heritage influences its points in this regression. The French and Spanish effects are relatively large: French colonial heritage raises points by 22 percent and Spanish heritage raises points by 43 percent. The latter is not a South American effect because all countries in South America were independent before 1900. Gaining independence from Portugal has a negative impact on points; it lowers them by 61 percent. While this result seems counterintuitive, the Portugal heritage dummy does not pick up the effect of Brazil, which gained in dependence in 1822. Since our heritage dummies exclude South America, our results say nothing about the success of Latin American countries in international soccer competition.

Despite the popularity of cricket and rugby in former British colonies, British colonial heritage raises points by 7 percent. While this result does not directly refute Foer's claim that the colonies lose against their colonizers, it indicates that British heritage lifts their points. The effect of the Netherlands dummy is very strong: Dutch heritage lowers a country's points by 72 percent. (This effect is a result of only two countries' gaining independence from the Netherlands in the 20th century: Indonesia has 131 points and Netherland Antilles have 55 points.)

The remaining dummy variables account for each confederation so that we can separate the confederation effect from a country's playing in its own champions league. Since we omit the confederation dummy for North America, the confederation dummies are interpreted with respect to it. Playing in Africa and Europe raises points by 50 and by 74 percent, respectively, and playing in South America raises points by 96 percent. Playing soccer in the remaining conferences lowers points. Playing in Asia lowers points by 23 percent and playing in Oceania lowers them by 82 percent.

Playing in the quarterfinals has a uniformly positive effect. In Europe and Africa, each team that qualifies raises the country's points by 13.43 and 45.75 percent, respectively. In Asia, it raises points by 28.26 percent and in Oceania by 91.07 percent. The effect in North America is stronger than in South America: 24.77 versus 17.81 percent respectively. The team effects are stronger in the quarterfinal equation than in the round-32 equation, as one would expect. For Africa and Asia, the effect is statistically stronger at the 5% level of significance. We interpret these results as showing that the willingness and ability to create strong private soccer institutions leads to a successful national soccer team.

We compute the marginal effect of the preceding coefficients based on the average conference FIFA points. In Europe, the average points are 686.85, so that a 13.43 percent increase results in 92 additional points: placing a team in the quarterfinals brings 92 more points. Analogously, in Africa and South America, placing a team in the quarterfinals generates an extra 158 and 152 points. The large percentage effect for Oceania (91) results in a smaller absolute increase in points (142) than for the preceding conferences because the average points for Oceania are very low (155.88). Asia and North America have similar percentage increases and similar mean points (230.57 and 256 respectively) so that placing a team in the quarterfinals adds a similar number of points: 65.25 and 63.49. The marginal effects are summarized in Table VII.

While the pseudo R^2 is 0.6615, it is of limited value in evaluating a Poisson regression. More importantly, the χ^2 statistic of 36,799 reflects an extremely strong degree of significance of the equation.

VI. Conclusion

Previous studies have found that nations with higher incomes and larger populations perform better in international soccer competition. Using FIFA's new ranking system,

we confirm this basic finding. FIFA points rise with (the natural logarithm of) GDP per capita and population. We also confirm that hosting the World Cup is associated with more FIFA points, which indicates that this form of institutional and popular support of soccer contributes to success. We find less clear evidence regarding the impact of the length of time in FIFA. In the OLS regression, the number of years the nation's federation is affiliated with FIFA does not have a statistically significant impact.

In his recent essay, Foer (2006) suggests that, while nations with authoritarian and totalitarian governments can readily marshal resources to succeed in international competition, social democracies have been more successful in World Cup competitions. Our Poisson findings broadly support Foer. Being in OECD positively affects performance as does being a former or current communist country, and the latter effect is smaller than OECD membership. Our measure of infringements on political rights and civil liberties, the Freedom House ranking, also improves performance, but the effect is extremely small. Our OLS results show that members of OECD, the world's most prosperous democracies, perform better in international soccer and that being more autocratic or having a communist past does not add to soccer performance. In sum, as is generally the case, it pays to be a prosperous democracy.

While we do not directly test Foer's claim that colonizers outperform their former colonies, our results from the Poisson regressions indicate that a nation's colonial history affects its performance. Why former Spanish colonies outperform former English colonies, or why former Dutch or Portuguese colonies perform worse than colonies that gained independence from other countries, is beyond the scope of this paper. Our OLS results show no statistically significant impact of colonization. Both sets of estimates contradict Foer's other claim that oil-exporters have relatively poorer teams.

To assess the impact of national institutions, we hold constant the confederation effect. As suggested by their play on the international stage, North and Central America produce middling national soccer teams. With CONCACAF as our default category, the dummy variables for countries that belong to the South American, European, and African confederations were positive, while the dummy variables for the Asian and Oceanic confederations were negative (or, in the case of the OLS estimates for Oceania, insignificant). In part, this result reflects FIFA's scoring policy, which puts greater weight on points of teams from stronger confederations and less weight on points of teams from weaker ones.

We introduce a proxy variable for national institutions that reflects a nation's willingness and ability to pursue soccer: the success of the nation's club teams in a Champions League or Champions Cup competition. Having one more club team advance to the round of 32 or the quarterfinals of each confederation's competition had a uniformly positive impact on the performance of the national team. (The only exception is the Asian quarterfinals in the OLS regression, as explained above.) Having another team advance to the quarterfinals had at least as large an effect on international performance as advancing to the round of 32. Sometimes, this effect was significantly larger. The size of the effect varies by confederation: we present the marginal impacts in table VII. In the

quarterfinal equations, the AFC and CONCACAF had consistently the smallest impact, while CAF had consistently the largest impact across both specifications.

We conclude from the impact of the institutional proxy that countries with stronger club teams have the desire and resources to create a strong national team as well. This is not a tautology. The success of nation's club teams does not automatically reflect the quality of a national team's players and thus the national team: the best national players may work abroad. For example, the top two players from France's recent World Cup team played for club teams in England (Thierry Henri played for Arsenal) and Spain (Zinedine Zidane played for Real Madrid). Our results also refute Foer's suggestion that (European) teams do not have to develop strong domestic leagues and that they can create strong national teams by letting their best players play and train abroad.

This study provides a more systematic approach to specifying the determinants of soccer performance than previous studies. Our findings are broadly consistent with earlier findings, but expand and improve upon them in four ways. First, we build and estimate a comprehensive theoretical model. The richer specification results in a superior overall fit when explaining international soccer success. Second, we add measures of political structure and history that allow us to test Foer's claims that such factors affect international soccer performance. Third, we create a new, original measure of soccer institutions and show that it is important for international soccer success. Finally, we introduce Poisson regression, which is more appropriate than OLS for explaining FIFA points.

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Table I
List of FIFA Confederations and Their Leagues

Confederation	Foundation Date	Membership/Sample
Asian Football Confederation --AFC: Champions League	1954	46/42
Confédération Africaine de Football --CAF: Champions League	1957	53/53
Confederation of North, Central American and Caribbean Association Football --CONCACAF: Champions Cup	1961	40/28
Confederación Sudamericana de Fútbol --CONMEBOL Copa Toyota Libertadores	1916	10/10
Oceania Football Confederation --OFC: OFC Club Championship	1966	12/8
Union des Associations Européennes de Football --UEFA: Champions League	1954	52/48

Source: http://www.fifa.com/en/organisation/confederations/index.html

Countries not in our sample:

<u>Europe</u>
Andorra
Faroe Islands
Liechtenstein
San Marino

<u>Asia</u>
Guam
Myanmar
Palestine
Timor Leste

<u>Central America & Caribbean</u>
Anguilla
Aruba
British Virgin Islands
Cayman Islands
French Guyana
Guadeloupe
Martinique
Montserrat
Saint-Martin
Sint Maarten
Turks and Caicos Islands
US Virgin Islands

<u>Oceania</u>
American Samoa
Cook Islands
New Caledonia
Tahiti

Table II

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 etc.)* *Formula: [200 - Position] / 100*
Regional strength	*Based on results in last three FIFA World Cups* *(wins per confederation per match)*
Period assessed	*Last four years, gradual decline in importance of results:* *100% - 50%-30%-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)

a) Points

Win	3 points
Match status	x 2.5
Opponents	x 1.8
Regional weighting	x 1.0
Multiplication factor	x100
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) Four-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**

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

Table III
Variable Definitions

Dependent variable:

Points = FIFA points in September 2006

Capital and labor:

lngdpc = natural log of 2003 income (rpgdpch from Penn World Tables)
lnpop = natural log of 2003 population (from Penn World Tables)

Five variables for political and institutional effects:

CAR = Freedom House Combined Average Rating for 2005
Dcom = 1 for formerly and currently communist countries
Doecd = 1 for all countries that are members of OECD
Dhost = 1 for countries that have hosted the World Cup
Doil = 1 for countries whose ratio of oil exports to GDP is more than 10% (Ross, 2001)
FIFAyears = the number of years since joining FIFA

Five dummy variables for colonizers:

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

Five dummy variables for confederation membership in 2006:

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 and in the round of 32:

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

Table IV
Variable Statistics – Dummies Excluded

Variable	Obs	Mean	Std. Dev.	Min	Max
Points	187	410.861	362.198	0	1574
lninc	186	8.615451	1.204669	5.836	10.805
lnpop	192	8.646238	2.012192	2.982	14.068
CAR	189	3.21164	1.961782	1	7
FIFAyears	188	51.41489	28.11756	1	102
Africa32*	192	.1614583	.4689009	0	2
Asia24	192	.125	.4853886	0	2
Euro32	192	.1666667	.6417689	0	4
Oceania8**	192	.0260417	.1596756	0	1
Copa32	192	.1666667	.7473046	0	6
Africa8	192	.0416667	.2249685	0	2
Asia8	192	.0416667	.2249685	0	2
Euro8	192	.0416667	.2863991	0	3
Copa8	192	.0416667	.2863991	0	3
NAmCup8	192	.0416667	.2674944	0	2

*We record only 31 teams, as one is from Zanzibar.
**We record only 5 teams, as one is from Caledonia and two are from Tahiti.

Table V
Determinants of Points in OLS (n = 181; t-ratios in parentheses)

Independent Variable	Points (8)	Points (32)
constant	-675.40	624.22
	(-3.16***)	(-2.95***)
lngdpc	51.97	53.28
	(2.65***)	(2.79***)
lnpop	54.64	48.16
	(5.14***)	(4.54***)
Doecd	110.09	41.21
	(1.87*)	(0.70)
Dhost	215.57	180.78
	(2.70***)	(2.36**)
Doil	129.37	82.86
	(2.12**)	(1.35)
Deurope	254.56	220.16
	(4.43***)	(4.17***)
Euro8/Euro32	210.75	220.16
	(3.45***)	(5.04***)
Dsam	277.84	---
	(2.94***)	---
Copa8/Copa32	233.10	155.82
	(3.59***)	(6.01***)
Dasia	-122.24	-129.95
	(-1.99**)	(-2.31**)
Asia8/Asia32	41.08	62.11
	(0.55)	(1.74*)
Dafrica	96.34	49.41
	(1.65*)	(0.85)
Africa8/Africa32	259.95	140.35
	(3.56***)	(3.34***)
NAmCup8	46.55	---
	(0.72)	---
	Adj. $R^2 = 0.6884$	Adj. $R^2 = 0.7006$

*significant at the 10% level
**significant at the 5% level
***significant at the 1% level

Table VI Poisson Regression Results for the Determinants of Points		
Variable	Coefficient	t-statistic
lngdpc	0.1710	29.02
lnpop	0.1543	48.42
CAR	0.0112	3.32
Dcom	0.1641	10.81
Doecd	0.2180	13.40
Dhost	0.1639	10.74
Doil	0.2513	16.87
FIFAyears	0.0021	11.29
Dfrance	0.2208	13.52
Dneth	-0.7198	-11.25
Dport	-0.6089	-11.72
Dspain	0.4328	10.70
Duk	0.0673	5.40
Dafrica	0.5040	22.12
Africa8	0.4575	29.86
Dasia	-0.2339	-10.42
Asia8	0.2826	15.74
Deurope	0.7454	34.56
Euro8	0.1343	15.43
Dsam	0.9636	39.43
Copa8	0.1781	18.60
Doceania	-0.8165	-9.73
Oceania8	0.9107	10.34
NAmCup8	0.2477	16.26
Likelihood Ratio (χ^2)	36,799.07	

Table VII

Marginal Effects in OLS and Poisson Estimations

Independent Variable	OLS	Poisson
lngdpc*	5.51	12.78
lnpop**	5.57	11.10
Doecd	110.09	89.57
Dhost	215.57	67.34
Doil	129.37	103.25
Africa8	259.95	157.74
Asia8	0	65.25
Euro8	210.75	92.04
Oceania8	0	142.00
Copa8	233.10	152.72
NAmCup8	0	63.49

*The marginal effect is per $1000

**The marginal effect is per 1 million people