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How to predict the 2014 World Cup winner (in one simple equation): determinants of national football team results 2011-2013 - a new methodology

N Scelles, University of Stirling and W Andreff, University of Paris 1

I Introduction and background

This short note sets out an approach to predicting national football team results using a new, hybrid economics-based methodology. It draws on previous work in the field and was tested on almost 3,000 international football matches over the period 2011- 2013. The same methodology can be used in a predicative way and could be used, for example, to predict the result of the 2014 World Cup in Brazil. A forthcoming article to be published by the Fraser Economic Commentary will seek to predict Scotland's likely progress in the forthcoming Euro 2016 competition.

II   Methodology

The approach is to specify and estimate a score equation based on previous literature, plus some new determinants. Our variables depend on determinants already identified in previous literature:

- *Population difference* - the difference between the log of the populations for the two teams' nations, divided by the log of the smallest population among the two;

- *GDP per capita difference* - the difference between the log of the GDP per capita (in US dollars) for the two teams' nations, divided by the log of the smallest GDP per capita among the two;

- *Climate difference* - the difference between the square of (temperature - 14°C) for the two teams' nations, divided by the lowest square of (temperature - 14°C) among the two;

- *Experience difference* - the difference between the log of the number of matches played between the two teams, divided by the log of the smallest number of matches played between the two;

- *Share of players' difference* - the difference between the log of the number of players divided by the log of the population for the two teams' nations, divided by the smallest value for the log of the number of players divided by the log of the population among the two. We expect that a large population is not sufficient as the share of players among this population is also an important factor. It is worth noting that even though we are interested in men's football, data for population and share of players also, clearly, include females; this is consistent with previous research. The assumption is that the share of men in every population and the share of men's players in every number of national players are the same for every country. Obviously, this is not true but we can consider our data for population and share of players as good approximation of the difference between countries;

- Home advantage which is a dummy and is 1 if a team plays at home.

We then introduce our own, new determinants which are:

- *Quality of players' difference* - the difference between the numbers of players in the Top 10 most valuable clubs with at least 20 appearances during a season between the two teams. The Top 10 most valuable clubs are Real Madrid, Manchester United, FC Barcelona, Arsenal, Bayern Munich, AC Milan, Chelsea, Juventus, Manchester City and Liverpool (with more than $650m for every Top 10 team, as compared to $520m for the 11th placed one, Tottenham (Forbes[1], 2013). The assumption is that the best players have an incentive to play in the teams which have the best financial means to pay them;

- *Foreign managers' difference* - the difference between the two countries for foreign managers from the core group of western European countries that correspond to a dummy equal to 1 for countries with a foreign manager from either Belgium, France, Germany, Italy or Netherlands. This dummy is based on the elements developed by Kuper and Szymanski (2012, p. 329) in Soccernomics[2];

- *Technology transfer difference* - the difference between the two countries for managers having played for a club belonging to the core group of western European countries which is a dummy that is 1 for countries with a manager having played for a club or been trained by a manager belonging to Belgium, France, Germany, Italy or Netherlands (0.5 if the club was in the second division);

- *Prize* - is a dummy that is 1 for the favourite team (at least a difference of 0.1 between the two teams in betting odds) in a match with sporting prize for the two teams;

- *Prize difference in favour of the favourite* - is a dummy that is 1 for the favourite team when it has a sporting prize whereas the underdog has no sporting prize;

- *Prize difference in favour of the underdog* - is a dummy that is 1 for the underdog when it has a sporting prize whereas the favourite has no sporting prize;

- *No prize* which is a dummy that is 1 for the favourite in a match without sporting prize for the two teams.

Using the above, we selected a linear specification to predict the score in any international men's football match. We specify this as follows:

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[1] *Soccer's most valuable teams. Retrieved February 26, 2014, from* http://www.forbes.com/soccer-valuations/

[2] *"Western Europe has discovered the secret of football. More precisely, a core group of western European countries has: namely five of the six nations that in 1957 founded the European Economic Community, ancestor of the European Union. (We'll leave out the sixth founding nation, the pathetic minnows Luxembourg.) West Germany, France, Italy, Holland and even Belgium don't all play in exactly the same style. Holland and Italy, say, are rather different. But they all adhere to the basic tenets of rapid collectivised western European football." In the chapter 18 of their book, Kuper and Szymanski (2012) seem indicate that Spain is now connected to the core group of western European countries. Nevertheless, they only talk about the example of FC Barcelona and the influence of the Dutchman Johan Cruyff. This explains why we do not incorporate Spanish managers among foreign managers from the core group of western European countries;*

$$S_{ijtsd} = \beta_0 + \beta_X X_{ij} + \beta_Z Z_{ijt} + \beta_W W_{ijts} + \beta_K K_{ijtsd} + \varepsilon_{ijtsd}$$

Where:

S_{ijtsd} is the score for the match between the team i and the team j during the year t, the semester s and the day d;

β_0 is an intercept term;

β_X the coefficients of the explanatory variables **X_{ij}** which depend on the team i and the team j (Climate and Share of players differences);

β_Z the coefficients of the explanatory variables **Z_{ijt}** which depend on the team i and the team j during the year t (Population and GDP per capita differences);

β_W the coefficients of the explanatory variables **W_{ijts}** which depend on the team i and the team j during the year t and the semester s (Quality of players' difference);

β_K the coefficients of the explanatory variables **K_{ijtsd}** which depend on the team i and the team j during the year t, the semester s and the day d (Experience, Foreign managers and Technology transfer differences, Home advantage, Prize, Prize difference for the favourite, Prize difference for the underdog and No prize); and

ε is a stochastic error term.

We used the above equation to analyse a sample of game-specific data for all international men's football matches over the period from 2011 to 2013 (2,854 observations with Montenegro excluded due to data limitations on the number of players). Score, Experience, Share of players and Home advantage were found or calculated from FIFA sources. Population was sourced from the United Nations website, GDP per capita from the International Monetary Fund (IMF) and Temperature from the World Bank. Quality of players was sourced from ESPN and Wikipedia; Foreign managers and Technology Transfer from Wikipedia; and Prize / Prize difference for the favourite / Prize difference for the underdog / and No prize from BetBase1.

III   Forthcoming analysis of Scotland's predicted performance in the 2016 Euro competition

Using this methodology we could predict the outcome of the 2014 World Cup Finals in Brazil. However, we will present an article in the forthcoming Fraser Economic Commentary (October 2014) that will predict Scotland's success in the forthcoming Euro 2016 competition.

References
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Author details:

Dr N. Scellesa (Corresponding Author)
School of Sport
University of Stirling
FK9 4LA Stirling UK
E-mail: nicolas.scelles@stir.ac.uk

Professor W. Andreff
Department of Economics
University Paris 1
F-75647 Paris
France