Managerial Performance and Team Composition in International Soccer: Evidence from Jamaica

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Abstract

This paper uses data from 188 international matches played by the Jamaica national senior soccer team between 1995 and 2014 to examine the role of a variety of different factors on match performance. The econometric analysis is conducted using two match performance variables – goal difference and match result – and the regression models control for the identity of the coach, the composition of the national team, the quality of the Jamaica and opposition teams, disciplinary sanctions, the venue of the match as well as the fixture type. The results provide evidence of a variation in team performance across different national coaches however the presence of domestic league players in the national side exerts no independent effect on match outcome. In addition, the issuing of a red card to an opponent improves both goal difference and match outcome in Jamaica's favour, as does playing lower ranked opponents on the basis of FIFA's country rankings.

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Introduction

Soccer is the second most popular team sport in Jamaica after cricket. Jamaica joined FIFA in 1962, however it played its first international soccer match against Haiti in 1925 resulting in a 2-1 victory for Jamaica.[2] During the period leading up to its Independence in 1962, Jamaica mostly played matches against its Caribbean neighbours drawing largely on playing talent from locally based clubs. The country embarked on its first attempt at qualifying for the FIFA World Cup in 1966 when it was staged in England under the Brazilian coach Jorge Penna. The attempt ended in failure at the qualifying group stages.[3] A combination of insufficient funds and poor team preparation prevented the island's participation in the qualifying stages of subsequent World Cup competitions in the late 1970s and 1980s.

The Jamaica national team returned to the qualifying rounds of the World Cup in the 1990s under the management of a Jamaican coach but qualification for the finals again eluded the team until the hiring of the Brazilian technical director Rene Simoes. Under his leadership, Jamaica's strategy for the 1998 'Road to France' campaign was to actively search for and attract professional football players of Jamaican extraction, primarily those based in professional English clubs. This approach was intended to enable the team to leverage the skills available from these more experienced professional players. The approach proved successful as Jamaica became the first English-speaking Caribbean country to qualify for the World Cup in 1998. However, it has not qualified for the finals since.

The empirical literature on the international performance of national soccer teams has exploited macroeconomic variables such as GDP per capita and various demographic indicators to identify possible cross-sectional determinants of team performance. The seminal work of Hoffman, Ging and Ramasamy (2012) stems from the observation that although football is a popular team sport both in terms of viewership and participation there are differences in the success of nations at international soccer tournaments. This is despite the resources typically allocated to the sport, as well as policy attempts to exploit the sport as a tool or expression of a country's nationalism. The authors highlight the

[2] This fixture was part of a three match competition between Jamaica and Haiti with Jamaica winning all three matches.

[3] Jamaica also attempted to qualify for the 1970 World Cup in Mexico. However, a team heavily depleted by the migration of the 1966 team's best players lost all its preliminary matches. In the 1974 qualifiers for the World Cup in West Germany, the team was forced to withdraw due to behavioural sanctions imposed by FIFA.

dominance of South American and European teams at the World Cup. They use a sample of 76 countries to analyse the role of population, GNP per capita[4], the popularity of football as proxied by language, and the country's record in staging the World Cup in explaining international football success. They find a quadratic relationship between football performance and GNP per capita indicating a decline in the contribution of wealth to soccer performance beyond a certain level of national income.

There is an emerging literature that has assessed team performance using match level rather than country-level data (e.g., Torgler (2004), Van Ours and Van Tuijl (2010), and Bachan, Reilly and Witt (2014)). Bachan et al. (2014) use match-specific variables, including the racial composition of the starting XI, to investigate the determinants of match outcomes for the English and French national soccer teams. The authors find no evidence that the racial composition of the team matters in determining these outcomes. The empirical methodology and the nature of the match-level data used in Bachan et al. (2014) are closest in spirit to that adopted in the current study.

The aim of this paper is to explore the determinants of match performance of the Jamaica men's senior national football team. The paper investigates two research questions. The first relates to the managerial performance of different national coaches to assess whether there are differences across coaches once the analysis controls for an array of match-level variables (including the quality of the opposition). Over the period covered by our data, there were nine different national coaches. Five of these were foreign reflecting a commonly held perception within Jamaica that foreign coaches have more to offer in terms of improving team performance.

The second research question examines whether the composition of the national team in terms of the proportion of domestic league players in the starting XI exerts an independent effect on match performance. The Jamaican football authorities have continued a drive to recruit foreign-based Jamaican players to the national squad, and this is often criticised by supporters of the local domestic league who argue that domestic league players are able to contribute positively to Jamaica's match

[4] This is used as a proxy for the development of youth football, access to equipment and the availability of leisure time in which to learn and practice football.

outcomes. Berlinschi et al. (2011) find that the migration of players to foreign football leagues improves their home country's performance in international football.[5] It was previously thought that migrating sport professionals negatively impacted the sporting capacity of developing countries (Swinnen and Vandermortele (2009) as cited in (Berlinschi, Schokkaert, & Swinnen, 2011) and (Karaca, 2008)). Therefore, it is hoped that this particular research theme will inform this particular debate.

In addition, we also explore a number of sub-themes relating to team depletion, venue and fixture type. The impact of team depletion through the use of red card cautions is explored in the literature by Mechtel et al. (2011). The study assesses the impact of red cards on match outcomes using data at club level from the German Bundesliga. They find that red cards awarded to the home and visiting team impact the home team's performance negatively but exert no impact on the visiting team's performance. The current paper investigates whether this finding generalises to the international context by investigating if it has any resonance with the experience of Jamaica's national team.

The next section presents the econometric methodology and is followed by a section containing a description of the dataset employed. The empirical results are presented and discussed in section four with some concluding remarks contained in the final section.

Econometric Methodology

The empirical methodology uses two outcome metrics for team performance, in conjunction with two econometric modelling techniques, to explore the relationship between team performance and an array of team/match level variables.[6] The first measure of match performance is the goal differential between Jamaica and the opposition teams at full time, where a positive (negative) number indicates a Jamaican win (defeat), and a zero denotes a drawn game. The OLS technique is used to estimate the following relationship:

$$Goal\ Difference_i = \boldsymbol{x}_i'\gamma + e_i\ where\ e_i \sim N(0, \sigma^2) \qquad [1]$$

[5] A similar positive result was found by Alvarez et. al. (2008) in their analysis of basketball players in Europe.
[6] See Dixon and Coles (1997), Lee (1997), Maher (1982), and Rue & Salveshti (2000). .

In this model **x** comprises a vector of variables assumed to determine match performance and *i* is the subscript capturing the 1 to 188 matches played by the team over the sample period. An array of diagnostic tests[7] is conducted for regression model [1] to determine if the model is correctly specified. In order to cater for any potential outlier observations, a bootstrapped median regression is also estimated using the goal difference measure. This will permit an assessment of the degree to which the OLS estimates are sensitive to the presence of such outliers, which tend to be common when modelling goal difference outcomes.

This second model specification used is an ordered probit where the outcome variable ($Result_i$) is coded as an ordinal variable with 0, 1 and 2 representing a 'loss', 'draw' or 'win' match outcome respectively. If we assume $Result_i^*$ represents an unobservable (latent) dependent variable for the i^{th} match outcome, this can then be expressed as a function of a vector containing a set of explanatory variables, where **β** comprises a vector of unknown parameters:

$$Result_i^* = x_i'\beta + u_i \; where \; u_i \sim N(0,1) \qquad [2]$$

The $Result^*_i$ variable is related to an observable ordinal variable $Result_i$ such that:

$Result_i = 0$ ['loss'] if $-\infty < Result^*_I < \Theta_0$

$Result_i = 1$ ['draw'] if $\Theta_0 < Result^*_I < \Theta_1$

$Result_i = 2$ ['win] if $Result^*_I \geq \Theta_1$

The prob[$Result_i$=j] = $\Phi(\Theta_j - x_i'\boldsymbol{\beta}) - \Phi(\Theta_{j-1} - x_i'\boldsymbol{\beta})$ for j=0, 1, 2 where $\Phi(\cdot)$ represents the cumulative distribution function operator for the standard normal.[8] The log-likelihood function relating to this model, in its most general form, is given as:

[7] These tests include the Cook-Wiesberg heteroscedasticity test, Ramsey's misspecification test (RESET), the Jarque-Bera normality tests, and a non-parametric sign test for the randomness of the residuals.

[8] The STATA econometric software used in this paper sets the constant to zero and estimates the two threshold parameters Θ_0 and Θ_1 given an identification problem.

$$L = \sum_{i=1}^{n} \sum_{j=0}^{2} \delta_{ij} \log_e [\Phi(\theta_j - \boldsymbol{x}_i'\boldsymbol{\beta}) - \Phi(\theta_{j-1} - x_i'\boldsymbol{\beta})] \quad [3]$$

where $\delta_{ij} = 1$ if the outcome of the i^{th} match falls within the j^{th} category and 0 otherwise. The operator $\log_e(.)$ denotes the natural logarithm. The model is estimated using conventional algorithms to obtain maximum likelihood estimates for the **β** parameter vector, two threshold parameters, and the asymptotic variance-covariance matrix for the model's estimated parameters. The pseudo-residuals from this model [2] are also computed and provide the basis for the construction of an array of LM diagnostic tests.[9]

Data

The dataset comprises 188 international soccer matches played between March 12, 1995 and May 29, 2014. The data have been collated from a number of soccer archiving sites such as RSSSF.com and FIFA.com. However, the start date for the data is determined by the earliest date for which FIFA country rankings are available for the Jamaica team and its opponents. The data span a period of nine national team coaches – from Rene Simoes to the current incumbent Winfred Schafer – and include both local and foreign coaches. During this period, the team played four types of fixture – friendlies, CONCACAF, World Cup matches and a variety of regional Caribbean Cup fixtures. As already noted, over the sample period the team qualified for just one of the five World Cup finals staged.[10]

<Table 1a here>

Table 1a provides a frequency distribution of match results by venue and indicates that the overall win rate for the Jamaica team is close to 40%. In addition, match outcomes are found to be dependent on venue with a win being more likely at home than elsewhere. In table 1b, the frequency distribution reports match outcomes by fixture type. It is evident from this table that the Jamaica team is more likely to win matches in Caribbean Cup and CONCACAF fixtures as opposed to friendlies and World Cup

[9] These diagnostic tests include efficient score tests for pseudo functional form (a version of the RESET), homoscedasticity and normality (see Machin and Stewart (1990) for the technical details). In addition, a non-parametric sign (or 'runs') test is also conducted to investigate for randomness in these residuals across time.
[10] The 'finals' refers to the matches played at the tournament staged on a quadrennial basis.

matches. CONCACAF fixtures (47%) represent the most frequent type of fixture played during the period.[11]

<Table 1b here>

Variable definitions and summary statistics are presented in table 2.[12] The average goal difference for the Jamaican team over the sample is 0.043 and 43% of the matches during this period were played at home. Thirty-eight red cards (a red card in 15.4% of the matches) were issued to Jamaican players in comparison to just 18 (a red card in 9% of the matches) for opposition teams. The mean difference in red card rates between Jamaica and opposing teams is statistically significant at the 5% level.[13]

<Table 2 here>

The opposing team FIFA rankings ranged from 1st (the highest) to 199th, while Jamaica's own ranking over this period ranged from 30 to 116. The average FIFA ranking of opponents was 66.[14] The variable capturing information on the national coaches reveal that Simoes and Whitmore were the two longest serving coaches over the sample period. In terms of the Jamaican team's composition, the team averaged a 22% starting eleven drawn from its own domestic league. On average, Jamaican players received 1.6 yellow cards per match in comparison with 1.3 for the opposition. The average difference in the number received is statistically significant.[15]

Empirical Results

[11] Table A2 in the appendix presents a qualitative view of the performance of the team in competition and demonstrates the relatively better performance of the team at Caribbean competitive fixtures than in the wider CONCACAF grouping.
[12] Definitions and means for the Coach dummy variables are presented in table A1.
[13] The t-statistic for this test is 2.2135 with df=187.
[14] These rankings at the time each match was played were obtained from www.fifa.com/worldranking/rankingtools/index.html .
[15] The t-statistic is -3.323 with df=187 and prob-value=0.000.

The results of the OLS estimation of equation [1] are presented in column (1) of table 3. The research theme around coach performance is discussed separately below. However, we find no statistical evidence using the OLS procedure to suggest that the domestic composition of the starting XI impacts the goal difference in any way. We now move our discussion on to our other research sub-themes. The OLS estimates reveal that the effect of a disciplinary red card for the opposing team exerts a statistically significant effect on goal difference. In particular, the proposition that the depletion of the opponent's team increases the goal difference in Jamaica's favour by one goal cannot be rejected by the data (|t| = 0.017). The red card result is resonant of findings in the recent literature on international team performance (e.g., see Bachan et al. (2014)). However, it is in contrast to the results reported in Mechtel et al. (2011) who find, using club level data, that team depletion of the opposition has a negative impact on the home team.

The venue of the fixture and the FIFA ranking of the opponents are all found to be significant determinants of goal difference. The result in relation to the venue is supportive of the literature that playing at home provides an advantage to the home team arising from the presence of its own supporters and familiarity with playing conditions which acts to increase the Jamaican goal advantage by approximately 1.5 goals, on average and *ceteris paribus.* In addition, if the FIFA ranking of the opposition increases by 10 places relative to the average of 66 (i.e., falls to 56 representing the fact that the opponent is of superior quality), the goal difference in favour of Jamaica contracts by 0.27 goals, *ceteris paribus*.

The diagnostic tests reveal that the residuals are homoscedastic, though the null hypothesis of no omitted variables (or alternatively a linear specification) is rejected. The Jarque-Bera normality test reveals evidence of non-normality in the distribution of the residuals. This is confirmed by the kernel density plot of the OLS residuals reported in Figure 1, which indicates that the residuals are skewed to the left reflecting the higher tendency for Jamaica to lose matches. As a result, a bootstrapped quantile regression was estimated (see column (2) in table 3) to address issues relating to outliers. The substantive results obtained are invariant to the use of this alternative estimator suggesting that the key OLS findings do not reflect the impact of outlier observations. However, the trend estimate now

achieves statistical significance in the quantile regression model at a conventional level and suggests a declining *ceteris paribus* trend over time in the score differential favouring Jamaica.

<Table 4>

Table 4 reports the ordered probit estimates for the match result variable[16] (see column (1)) as well as the marginal effects of a 'win' (see column (2)). The efficient score (or LM) diagnostic tests reveal no evidence of non-normality or functional form mis-specification, but heteroscedasticity is detected as a potential problem. The latter violation impacts the consistency of the maximum likelihood mean estimates. However, we take a pragmatic view of this and are unconcerned whether the estimated effect observed is mediated through the mean or the ordered probit's variance function. All that concerns us here is that there is an impact on match result being mediated through the set of included variables.

The ordered probit estimates again suggest no significant effect for the domestic league composition of the starting XI. However, fixtures played at home increase the likelihood of a win by 37 percentage points, *ceteris paribus*, and an opposition red card increases the likelihood of a Jamaica win by 26 percentage points. If the fixture is a World Cup match, the win rate is six percentage points higher compared to a Caribbean fixture. Finally, a ten place increase in the FIFA ranking of the opposition team (reflecting a team of higher quality) decreases the likelihood of a Jamaican win by just under one percentage point.

We now explore the extent to which coaches improve/reduce the performance of the team with respect to the sample average performance. This is implemented using the deviation from the mean approach suggested by Haisken-DeNew and Schmidt (1997). This involves the computation of a set of normalized effects on the match outcome for the coach dummies and then re-expressing these as deviations from an overall weighted average outcome. This transformation has the advantage of expressing each

[16] This variable is coded 0 for a 'loss', 1 for a 'draw' and 2 for a 'win'.

estimated coach effect in relation to an average rather than to an arbitrarily selected base group in regression estimation.

<Table 5>

Column two of table 5 reports national coach effects in terms of deviations relative to the average goal difference (based on OLS estimates), while column three of this table provides deviations in terms of the outcome performance (based on ordered probit estimates). The unit of measurement for the deviations in the first case is goal difference, while in the second it is standard deviations. The OLS procedure yields no evidence that any of the nine coaches either improved/reduced the goal difference of the team relative to the average. However, in the case of ordered probit match performance model, the Jamaican born Whitmore is found to be the most successful national coach. The match outcome is 1.01 standard deviations above the sample average in his case. Rene Simoes and Clovis de Oliveira were found to have reduced the match result by 0.570 and 0.741 standard deviations *ceteris paribus*, respectively despite the success of the former in leading Jamaica into the World Cup finals in 1998. Taken together, these results indicate that an expectation of better results under foreign coaches is not supported by the data despite the presumption of greater experience and managerial skills at international level.

Conclusions

There is a widespread view in Jamaica that the inclusion of domestic league players and the employment of foreign coaches can ameliorate the performance of the senior football team. The findings in this paper question both these perceptions in that superior match outcomes were achieved by a domestic coach, *ceteris paribus*, and the composition of the team in terms of domestic league players is found to exert no independent effect on match outcome. The former result is not entirely supportive of the findings of Baur and Lehmann (2007) who emphasize the importance of recruiting foreign-based players in order to enhance match outcome performance of the national team. In addition, care should be exercised in employing foreign coaches based purely on their 'foreignness' as

the empirical analysis suggests that, in the past, they have offered little (and sometimes less) value added compared to their domestic counterparts.

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Table 1a: Frequency Distribution of Jamaica's Performance by Venue

	Win	Draw	Loss	Total	Win Rate
All Fixtures	74	44	70	188	0.394
Home Venue Fixtures	45	23	13	81	0.556
Away Venue Fixtures	21	18	50	89	0.236
Neutral Venue Fixture	8	3	7	18	0.444

Notes to Table 1: (a) Chi-squared test of independence of match outcome with respect to venue location gives a test statistic of 31.087 (df=4 And prob-value=0.00)

Table 1b: Frequency Distribution of Jamaica's Performance by Fixture Type

	Win	Draw	Loss	Total	Win Rate
All Fixtures	74	44	70	188	0.394
Friendly Fixtures	20	20	35	75	0.267
CONCACAF Fixtures	37	22	30	89	0.416
Caribbean Fixtures	16	2	3	21	0.762
World Cup Fixture	1	0	2	3	0.333

Notes to Table 1: (a) Chi-squared test of independence of match outcome with respect to fixture type gives a test statistic of 31.087 (df=4 And prob-value=0.00)

Table 2: Variable Description and Selected Summary Statistics

Variable Name	Variable Description	Minimum	Maximum	Mean
Goal Diff	The difference in the number goals scored between Jamaica and the opposing	-9	10	0.043
Result	= 0 for a loss;= 1 for a draw; = 2 for a win by Jamaica	0	2	1.021
Venue	=1 if game played at home; =0 otherwise	0	1	0.431
Yellow Card Jamaica	Total number of yellow cards received by the Jamaican team	0	6	1.654
Yellow Card Opponent	Total number of yellow cards received by the opposing team	0	6	1.319
Red Card Jamaica	=1 if a Jamaica player received a red card; =0 otherwise	0	1	0.154
Red Card Opponent	=1 if an opponent's player received a red card; =0 otherwise	0	1	0.090
Opponent's FIFA ranking	The opposing team's FIFA ranking prior to the match	1	199	66.005 (41.677)
Jamaica's FIFA ranking	The Jamaican team's FIFA ranking prior to the match	30	116	58.154 (19.722)
Friendly	=1 if International Friendly match; 0 otherwise	0	1	0.399
CONCACAF	=1 if CONCACAF match; 0 otherwise	0	1	0.473
WC	=1 if World Cup match; 0 otherwise	0	1	0.016
Caribbean	=1 if Caribbean Regional match; 0 otherwise	0	1	0.112
DBP	Proportion of domestic based players on starting eleven	0	72.73	21.72
Simoes[f]	=1 if team coached by Rene Simoes; 0 otherwise	0	1	0.271
Brown	=1 if team coached by Carl Brown; 0 otherwise	0	1	0.181
de Oliveira	=1 if team coached by Clovis de Oliveira; 0 otherwise	0	1	0.085
Lazaroni	=1 if team coached by Sebastio Lazaroni; 0 otherwise	0	1	0.037
Downswell	=1 if team coached by Wendell Downswell; 0 otherwise	0	1	0.080
Milutinovic	=1 if team coached by Bora Milutinovic; 0 otherwise	0	1	0.032
Whitmore	=1 if team coached by Theodore Whitmore; 0 otherwise	0	1	0.218
Barnes	=1 if team coached by John Barnes; 0 otherwise	0	1	0.053
Winfred Schafer	=1 if team coached by Winfred Schafer; 0 otherwise	0	1	0.043

Notes to Table 2: (a) The sample size of 188 refers to international matches staged between 12 March 1995 and May 29, 2014. (b) Standard deviations are reported in parentheses for continuous variables only. (c) *f* refers to the variable used as the base category in econometric estimation. (d) The t-statistic for the test of a difference in the mean number of red cards between Jamaica and the opposing side is 2.2135.

Table 3: Determinants of Jamaica's National Soccer Team Performance (Dep. Var. Goal Difference)

	(1)	(2)
Constant	-0.991	-0.358
	(0.941)	(0.822)
Venue	1.460***	1.052***
	(0.278)	(0.245)
Yellow Card Jamaica	0.014	0.014
	(0.105)	(0.108)
Yellow Card Opponent	-0.087	-0.017
	(0.124)	(0.135)
Red Card Jamaica	-0.128	0.222
	(0.378)	(0.424)
Red Card Opponent	0.992**	1.088**
	(0.459)	(0.457)
Opponent's FIFA ranking	0.027***	0.018***
	(0.004)	(0.004)
Jamaica's FIFA ranking	0.006	0.008
	(0.008)	(0.009)
Friendly	-1.21***	-1.266**
	(0.453)	(0.558)
CONCACAF	-0.196	-0.693
	(0.467)	(0.539)
WC	-0.606	-1.885
	(1.150)	(2.158)
DBP	-0.013	-0.011
	(0.010)	(0.012)
Time Trend	-0.005	-0.007**
	(0.003)	(0.003)
LM Diagnostic Tests	**Prob-Value**	
RESET – Correct Functional Form	0.002	
White Test – Homoscedasticity	0.283	
Normality	0.000	
Test for Randomness in OLS Residuals		
Runs Test	0.460	

Notes to Table 3: (a) The dependent variable is the goal difference between Jamaica and its opponent. (b) The model results labelled (1) is estimated using OLS for the international matches played by the Jamaica national team between March 12, 1995 and May 29, 2014. (c) The model results labelled (2) is estimated using a bootstrapped quantile regression with 200 replications in response to a concern that the errors are non-normal. (d)The model includes dummy variables for the nine coaches of the Jamaica national team during the time period (see Notes to Table 2 for the list of Coaches).

Table 4: Determinants of Jamaica's National Soccer Team Performance – Ordered Probit Model

	Result	Marginal Effect for a 'Win"
Venue	1.007***	0.371***
	(0.207)	(0.072)
Yellow Card Jamaica	0.040	0.015
	(0.075)	(0.028)
Yellow Card Opponent	-0.030	-0.011
	(0.088)	(0.033)
Red Card Jamaica	-0.055	-0.020
	(0.263)	(0.097)
Red Card Opponent	0.671**	0.262**
	(0.325)	(0.125)
Opponent's FIFA ranking	0.017***	0.006***
	(0.003)	(0.001)
Jamaica's FIFA ranking	0.005	0.002
	(0.006)	(0.002)
Friendly	-0.862**	-0.304***
	(0.349)	(0.114)
CONCACAF	-0.265	-0.099
	(0.265)	(0.136)
WC	0.151	0.058
	(0.834)	(0.325)
DBP	-0.003	-0.001
	(0.007)	(0.003)
Time Trend	-0.005**	-0.002**
	(0.003)	(0.001)
$\widehat{\theta_1}$	0.391	
	(0.595)	
$\widehat{\theta_2}$	1.238	
	(0.598)*	
McFadden-R^2	0.234	
Maximised Log Likelihood Value	-154.845	
Number of Observations	188	
LM Diagnostic Tests	**Prob-Value**	
RESET	0.361	
Normality	0.361	
Heteroscedasticity	0.002	
Test for Randomness in Pseudo-residuals		
Runs Test	0.770	

Notes to table 4: (a) The dependent variable is the Result between Jamaica and its opponent. (b) The model is estimated using the ordered probit technique and includes dummy variables for eight of the nine coaches employed during the period. (c) The Wald test for no difference between the two threshold parameters is rejected with a test-statistic of 56.19 (prob-value=0.000), supporting the use of the ordered probit model over a univariate probit.

Table 5: Deviations from the Mean in Jamaica's National Team Managerial Performance

Manager	Goal Differential	Match Result
Simoes	0.061	-0.570*
	(0.384)	(0.301)
Brown	0.060	-0.283
	(0.289)	(0.223)
de Oliveira	-0.548	-0.741*
	(0.499)	(0.379)
Lazaroni	-0.493	-0.590
	(0.660)	(0.419)
Downswell	-0.234	0.613
	(0.504)	(0.393)
Milutinovic	-0.823	-0.517
	(0.759)	(0.607)
Whitmore	0.487	1.012***
	(0.439)	(0.352)
Barnes	-0.714	0.082
	(0.625)	(0.474)
Schafer	0.338	0.783
	(0.796)	(0.602)

Notes to Table 5: (a) ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 levels respectively using two-tailed tests.

Figure 1 Kernel Density Plot of OLS Residuals

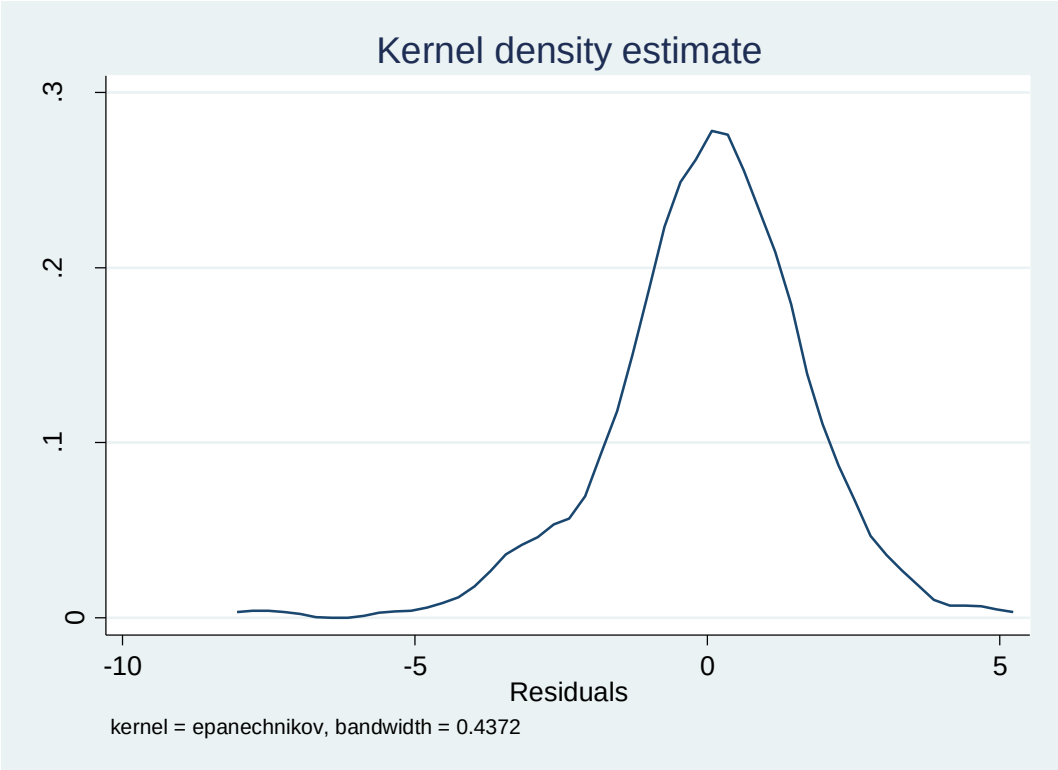

Table A1: Competitive Record 1962 – 2014

Competition	No Entry	Withdrew	Did Not Qualify	Round 1	Round 2	Quarterfinals	Winners
World Cup	2	2	6	1	-	-	-
CONCACAF	3	2	7	4		3	-
Caribbean	-	-	1	5	1	2	5