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SPORTS & EXERCISE | RESEARCH ARTICLE

How does team composition affect performance in continental tournaments?

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Abstract: There is a dearth of research on factors, which affect the composition of high performing teams in continental tournaments. Given the short time available for managers to prepare national teams for competitions, composing the right team will yield desirable outcomes. The paper traces the history of the African Cup of Nations (AFCON) tournament, investigates factors to consider in constituting national teams and determines how these factors affect team performance. We investigate team mix, young talent, team experience and international ranking as dimensions of team composition to determine their marginal effect on a team's ability to win medals in continental tournaments. Using panel data from AFCON competitions between 1990 and 2017, we study the performances of thirty-eight (38) African countries. This empirical study finds significant marginal effect of team mix, young talent, team experience and international ranking on performance in continental tournaments. We provide a model for composing winning teams. The study has implications for related disciplines in management science, which rely on teamwork, cohesion and diversity as well as recruiting the right personnel to achieve organizational objectives. Further research should consider a similar study in Europe and other parts of the world in a multivariate analysis.

ABOUT THE AUTHOR

Dr Ernest Yeboah ACHEAMPONG is a lecturer in the Department of Health, Physical Education, Recreation and Sports (HPERS) at the University of Education, Winneba and an Associate Researcher in the Laboratory of Sport and Social Environment at Université Grenoble Alpes, France. His research interests span from African football, footballers (male and female) migration and mobility, football management and coaching, youth football and education, sport for development and giving back phenomenon. In this research paper, we provide a framework as a guide for football managers or coaches to select a formidable national team with the right composition to yield the desired outcomes. We offer empirical suggestions for composing winning teams which consider elements like team mix, young talent, team experience and international ranking to improve teams' performance in continental tournaments.

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PUBLIC INTEREST STATEMENT

FIFA tournaments, UEFA competitions, and leagues have transformed global football with its popularity and viewership across the continents. African Cup of Nations (AFCON) tournament is the biggest Africa sporting event which allures media, foreign scouts, sponsors and viewership across the globe. Winning the overall tournament is prestigious and promote socioeconomic importance of players and coaches in the international football community. Considering the short time for managers to assemble medal-winning teams, it is crucial to have a framework as a guide. Some studies have identified components that promote team performance and winning of a tournament. From archival data on performance in AFCON events, the study reveals how active elite foreign and local players, a blend of young talents, team experience and familiarity with the terrain and nature of the tournament, and consistent high international ranking by FIFA guarantee higher medal-winning potential in continental tournaments.

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1. Introduction

We consider that a national team composed of more professional players from the elite leagues abroad and with the inclusion of quality local talents having age advantage tend to produce the needed outcomes in tournaments. There is a unifying element of the game which emanates from the individuals who come together to represent the group known as a "team". There is a paucity of empirical research on team characteristics, which affect team performance from the African setting. Managers of national teams have relative time-constraints to raise and prepare strong teams to excel in tournaments as compared to their club counterparts. It is therefore crucial for managers and football associations to rely on research-based frameworks to serve as a guide to compose winning teams. The question that comes to mind is; how does team composition maximize the probability of national teams winning medals in tournaments? We focus on hardly researched team characteristics that affect performance in tournaments.

The purpose of this study is to investigate team characteristics that maximize the medal-winning potentials of national teams. To do so, we provide a model testing the effect of (1) the presence of elite professional players from domestic and leagues abroad, (2) inclusion of quality young talents, (3) teams' international ranking, and (4) teams' experience in African continental tournaments. Considering the history of the African Cup of Nations (AFCON forthwith), we traced the trajectory of foreign-based players from the 1990s to 2017 because it depicts the period where football could offer socioeconomic opportunities through the shift of the European football market.

The current research contributes to existing studies by complementing the use of computer-based applications, algorithms and simulations in player recruitment (Filho, Lael, Basevitch, & Tenenbaum, 2014) and also previous studies which focused on socio-economic factors of team performance (Hoffmann, Ging Lee, & Ramasamy, 2002). The study contributes to theory and practice by abstracting from the concepts of teamwork, team building and diversity to achieve performance goals. The findings are also applicable beyond the limits of sports (football) extending to management disciplines, where teamwork is crucial to organizational performance. To the best of our knowledge, the interdisciplinary nature of this paper is a novelty in the area of sports from the perspective of Africa.

The remaining sections of the paper examine the history of AFCON and team performance. This helps to understand the past to date on how foreign-based players' participation for their national teams has shifted. This is followed by the relationship between team composition and performance, hypotheses development and conceptual framework. Data description and methodology, results, discussions and conclusions follow.

2. Review of literature and hypotheses development: history of AFCON and team performance

Competitions and other football-related activities are organized and managed by the Confederation of African Football (CAF, forthwith) formed in 1957 during the period of decolonization. It started with countries from Egypt, Sudan, Ethiopia and South Africa. They put together the statutes which were finally sealed on 8 June 1957, with Abdelaziz Abdallah Salem (engineer) as its first confederation president (see CAF website). The first competition was held in Sudan and won by Egypt, but South Africa could not take part due to their multiracial issues which deprived them of socioeconomic connections through sport. Until 1962, the tournament was divided into two levels, thus, the qualification and finals stages (direct elimination system). In 1992, participating countries increased to 12 through a direct elimination model. The number of participating nations

has since increased to 16 in 1996 and currently to 24 as Egypt prepares to stage the AFCON 2019 edition. AFCON, held biennially, is the biggest soccer event on the continent. The overall winner of AFCON represents the continent at the FIFA Confederation Cup. Currently, CAF has 55 member associations zoned into six (6) geopolitical regions comprising the Northern zone, West zones A and B, Central zone, Eastern zone, and Southern zone (see CAF website). Football has become part and parcel of many African countries ever since it was introduced in colonial times (Alegi, 2010). It has supported the integration of many communities in the new African nations by improving their feeling of belongingness.

CAF has figured out how to improve the domestic competitions leading to the introduction of the Championship of African Nations (CHAN) in 2009 to offer opportunities for domestic leagues' talents which is a novelty and creates socioeconomic benefits for participants. This could have contributed to improving the team performance of some nations at the AFCON tournaments (Alegi, 2010). Improvement in the standard of play, display of individual qualities and potentials that attract foreign media attention, scouts, football agents and foreign clubs during such tournaments are evidence enough (Acheampong & Bouhaouala, 2019).

AFCON records indicate that the game has attracted a high ratio of foreign-based players which have improved the level of play for those countries' national teams (Darby, 2014) in domestic and international competitions. This trend was absent in the 1965 AFCON when CAF introduced a rule that only permitted two foreign-based players to feature for their national team, a step possibly to check the football labor migration (Radnege, 1998). After its adoption for eight successive AFCON competitions, the rule was canceled in 1982. The migration of African players started far back in the colonial era. Between 1882 and 1905, Arthur Wharton (Jenkins, 1990), born into a - wealthy Euro-African family in the Gold Coast, played in the English leagues (Vasili, 1998) but could not feature for the Gold Coast team. In their studies (Lanfranchi & Taylor, 2001) reported that by 1938 there were more than 140 Africans playing in the French leagues one and two, respectively, while between 1945 and 1962 nearly 120 North Africans played in the French professional league. Eventually, some of these African players became the nationals of their former colonizers (Darby, 2010). The beginning of the twenty-first century has seen AFCON tournaments attracting the participation of more foreign-based players than the home-based players (Acheampong, Bouhaouala, & Michel, 2013). This has positively impacted on the team performance of some African nations (Cameroun, Nigeria, Senegal and Ghana) at the AFCON tournament and FIFA World Cup competitions.

African football development is not without challenges. The evolution of European football continues to enchant football talents from Africa to their leagues. FIFA's meager financial and technical support to member associations in Africa has worsened football development and performance of national teams on the continent. National football associations and local football clubs are sometimes soaked in social canker such as corrupt leadership, insufficient training facilities, lack of funding, disputes between ethnic football clubs, and bias officiating (Eugene 'Gusty' Cooper, 2011) that tend to retard the progress of the game and its economy. That also spans to lack of professionalism and poor institutional and structural development which derails Africa's football development agenda should they want to catch up with the standard achieved by UEFA (Acheampong, 2017). This can demonstrate how ineffective national football governance can impact on teams' performance. Despite these challenges, Africa successfully hosted the 2010 FIFA World Cup in South Africa for the first time in its history where FIFA made significant economic gains from the competition.

At senior world cup competitions, an African country is yet to reach the semi-final, with the farthest a country has advanced being the quarter-final; credits to Cameroon (1990), Senegal (2002) and Ghana (2010). This feat is not encouraging for a continent with abundant raw talents whose players have been instrumental to foreign clubs and countries (Armstrong, 2004). The "tortoise" approach to Africa's football growth is a setback, intensifying its talents' migration to

other continents' leagues. The underlying factors are due to limited socioeconomic opportunities at home. Their return to participate in AFCON tournaments creates opportunities for them through visibility and exposure to the international football markets. Yet, it is significant to understand how players' inclusion in their national teams can have an influence on the overall team performance in continental tournaments.

2.1. Team composition and performance

There have been studies on player selection particularly, players' skills and performance statistics, physical fitness, psychological factors (Arnason et al., 2004). Player selection based on the position by the Fuzzi inference system was applied (Tavana, Azizi, F. Azizi, & Behzadian, 2013). Research on factors determining team performance was done from a cultural perspective at the club level where multicultural factors were seen as strong determinants of team performance (Maderer, Holtbrügge, & Schuster, 2014). A hardly researched area on the composition of national teams based on certain characteristics and assessment of their performance in continental tournaments is the focus of this study. This helps to understand the significance of putting together a balanced team that can produce the needed outcomes in international competitions by considering the blending of quality players from domestic and foreign leagues.

The composition of a team depends on several factors, but the ultimate goal is for them to achieve the desired results. A homogeneous team is more productive than emphasizing talent disparity (Franck & Nüesch, 2010). It was found that increasing the number of foreign talents in a local league had a positive impact on the national team which is dominated by local players (Alvarez, Forrest, Sanz, &Tena, 2011). To Bell and Brown (2015), the selection and placement of team members provide one avenue for influencing team cohesion. Indeed, the success of a team must consider the right mix of individuals with the enabling conditions or factors that can best be positioned to accomplish their outcomes (Hackman, 2012). This makes the team cohesion very important in team composition. Team cohesion thus focuses on the social and motivational forces that bind team members together (Beal, Weiss, Barros, & MacDermid, 2005) which is important for multicultural teams, virtual teams, sport teams, military teams, and astronaut crews among others.

In team's sport, particularly football, the right mix of players mostly yields the best results for managers because poor management of diversity becomes dysfunctional to performance. The question is; what practice describes how coaches or managers assemble the best crop of football talents to realize their expectations? In practice, the default team staffing strategies are the individual-based composition models that focus on an individual's role-related technical skills and at best some consideration of the individual's generic teamwork skills (Bell & Brown, 2015).

Extant literature on team composition suggests that the configuration or specific combination of team member's Knowledge, Skill, Abilities, and Other Characteristics (KSAOs) (i.e., the team's composition) affects team-level outcomes such as cooperation (Eby & Dobbins, 1997), shared cognitions (Fisher, Bell, Dierdorff, & Belohlav, 2012.), information sharing (Randall, Resick, & DeChurch, 2011), team performance and most relevant to a team cohesion (Molleman, 2005). The pursuit of factors that maximizes the probability of high team outcomes is crucial. Thus, providing a framework for individual-based and team-based composition models can be integrated into predicting team outcomes (Mathieu, Tannenbaum, Donsbach, & Allige, 2014).

Individual-based composition models "focus on either individual and job requirements, or on members' generic team-related KSAOs" (Mathieu et al., 2014). So, an individual-based model applied to select members for a cohesive team may focus on what it means to be a "good team player" in terms of traditional person-job fit (i.e., position-specific KSAOs), or in terms of working within a team-based environment (i.e., position-specific KSAOs plus the addition of generic teamwork competencies). In some studies, individual-based composition models used in team staffing tend to rely on a classic selection model, which utilizes job analysis and team task analysis to

identify individual skills that drive performance in team settings and rely on individual-level predictors of individual-level team member performance (Zaccaro & DiRosa, 2012). Examples of individual-based methods are teamwork knowledge tests (Morgeson, Reider, & Campion, 2005) and situational judgment test on team role knowledge (Mumford, Van Iddekinge, Morgeson, & Campion, 2008). Although these approaches have supported in terms of predicting individual team member performance, these and other individually focused team staffing efforts are incomplete as they do not account for how the combination of team member KSAOs affects valued outcomes (e.g., team cohesion, organizational performance) (Bell & Brown, 2015).

Team-based composition models take a holistic view of how team member KSAOs are distributed across the team members. This can promote the social integration of members working towards a common goal. A team's compositional profile can be represented via the team's distribution (e.g., team averages, team diversities) on a KSAO, or via more complex configurations such as faultline strength, which can take multiple attributes into account (Mathieu et al., 2014). The use of team-based composition models does not diminish the importance of individual-level selection (Bell & Brown, 2015). In these cases, knowledge of a team's composition can be used to inform the development of training or other interventions that can help the team succeed. Team goals are prioritized over individual goals even when doing this causes the individual to make sacrifices (Jackson, Colquitt, Wesson, & Zapata-Phelan, 2006). Teams composed of members' high on goal priority with little variability are most likely to perform well over time (Dierdorff, Bell, & Belohlav, 2011).

Another school of thought investigated the pay–performance relationship in a direction where they considered the team performance as the dependent variable (Forrest & Simmons, 2002). Their studies identified a significant correlation between teams' pay and performance within the English football leagues (Szymanski & Kuypers, 1999). This demonstrates that the club's expenditure has a positive impact on team success. Using data from Italian, English and German football leagues, the authors find a strong team salary–performance relationship for the leagues in Italy and England (Forrest & Simmons, 2002). While in the German Bundesliga, only a marginal wage–performance relationship has been identified. This can also explain the situation that bonuses-performance relationship may not necessarily impact the overall team outcomes but one's ability to identify a suitable team composition.

Hypotheses: Based on the review of literature, the study seeks to test four hypotheses. These cover the thematic areas in the conceptual framework such as team mix, young talent, team experience and international ranking.

2.2. Team mix: players from foreign and local leagues

A teams' ability to integrate individual talent into collective efforts has a high probability of yielding the needed results. Players' international exposure and familiarity with the terrain hosting the tournament propels team performance. Players engaged in active football in top leagues offer enough experience that translates into high performance. Local players are familiar with the African environment and can survive the environment better. Teams with a good mix of these attributes may guarantee the probability of high performance. Empirical support is given to the effect that playing abroad and in stronger leagues makes a positive impact on performance (Allan & Moffat, 2014).

Poli, Ravenel, and Besson (2016) emphasize a high percentage of foreign-based players featuring for their national teams. On average, 68.9% of the minutes played by national teams were done by footballers playing abroad. This was revealed among some countries (Senegal, Northern Ireland, Ivory Coast, Iceland and Serbia) that do not have strong leagues from an economic point of view. In these countries, only footballers playing abroad have a real chance of being selected (Poli et al., 2016, p. 7) to represent their national teams at various international tournaments. Such

opportunities create social capital for players at the club, community and national levels. In short, they realized that those playing in top division leagues are a prerequisite to represent one of the top 50 national squads. The percentage of minutes played by footballers under contract with top division clubs is over 90% for both UEFA and non-UEFA member associations (Poli et al., 2016, p. 8). This can demonstrate how footballers in the elite leagues abroad are an important part of national teams. It was also observed that the majority of the footballers were playing with clubs in the big-5 European leagues (English Premiership, Spanish Liga, Italian Serie A, German Bundesliga and French Ligue 1),while only one country (Iran) did not field footballers in the wealthiest leagues in the world. Mourao. (2017) reported that clubs with more national team players perform better than those without such kind of players. The reverse of his study is seen in this current work where we propose that national teams with more players featuring frequently in elite clubs have better performance than those without such mix of players. A good team mix has a unique identity that transcends mere assembly of stars.

Team mix is measured by two variables. These are the ratio of foreign-based players to local-based players and the percentage of elite players. Foreign clubs have better training facilities which enable migrant players from low football countries to develop their talent and improve performance on the field when they play for their national teams (Berlinschi, Schokkaert, & Swinnen, 2013). We, therefore, hypothesize that:

H_1: There is significant positive effect of team mix on performance in tournaments.

2.3. Young talent

Individual performance depends on the ability of team handlers/managers to bring together players with complementary characters and characteristics (Poli, Ravenel, Besson, 2015a). They argued that it must match footballers' profile with the mental, physical, technical and tactical skills required to play in a given position per the style of team play of the coach/manager. In profiling of the squad performance of national A-teams from around the world, they considered players' age and employer clubs overseas (Poli, Ravenel, & Besson, 2015b, p. 1–2) and reports that these elements play a significant role in determining the performance of national A-teams in international competitions.

Poli et al. (2015b) identify an average age of players at 26.6 of 50 national squads studied. They identified that at age 27, players have sufficient experience to exploit their full potentials, whilst retaining a physical shape or stature that allows them to maintain sustained efforts. This adds value to players' quality and promotes international and national recognition. However, in their studies, they were skeptical about the average ages of three African countries (Nigeria, Ghana and Cameroun) seemingly suggesting that footballers born in Africa tend to be older than what they claim to be (Poli et al., 2015b, p. 2). It makes them counterproductive as players struggle to reach their full development of talent. This can be one of the reasons for which the real potential of African squads remains untapped as reported by Poli et al. They claimed that the youthfulness of national team squads suggests a promising future.

It is reported that athletes born in the first three months of the year perform better (in football) than their counterparts born in the last three months of the same year (Sierra-Díaz, González-Víllora, Pastor-Vicedo, & Serra-Olivares, 2017). The writers report that the relative age effect is prevalent in young and elite team sports including football. Significant relation is reported between age and performance in soccer (Augste & Lames, 2011) but this is yet to be confirmed in studies in Africa. Young talent is measured by the average of the team. We hypothesize that;

H_2: There is significant effect of young talents on team performance

2.4. Team experience

Player characteristics like age, origin, reputation, appearance, and position in a team influence players' salaries or estimated market value or transfer prices (Lucifora & Simmons, 2003). Experience and familiarity with a task have a positive effect on performance (Huckman, Staats, & Upton. 2009). In a different study, it is reported that consistent appearance in tournaments leads to fatigue and poor team performance (Scoppa, 2013). It is therefore not explicitly known how team experience affects performance. Team experience in particular tournaments makes the team more composed and less jittery and edgy during games. It is not out of place to conjecture that as teams make more appearances in a certain tournament, they stand a better chance of high performance than inexperienced ones.

Experience has been found to significantly affect team performance (Scelles & Andreff, 2015) but the current study uses a different approach to measure experience. In another study, a significant effect of team age (experience) on performance is reported (Mourao., 2017). He explains team age as the number of years the team has been in existence engaging in the game continuously which in this study is surrogate for team experience. Thus, having a team with a balanced structure in age and experience is a prerequisite to maintaining a satisfactory level of stability over the long term (Poli et al., 2015a). Team experience plays a critical role in tournaments since it relates to the number of matches an individual had played over a period. During the 2014/15 UEFA champions league, Bayern Munich, Barcelona and Real Madrid were the only clubs with the most experienced players that had played 37.6 games per player (Poli et al., 2015b). Such squad experience saw Barcelona finally winning the trophy in 2014/15. The same trend was observed in 2016/17 season with Real Madrid winning as it had more experienced players with over 37.6 games per player. We measure team experience by a number of appearances in the tournament and therefore hypothesize that:

H_3: There is significant positive effect of team experience on performance.

2.5. Team international ranking

Teams have got some pedigree or image to protect which also augment their winning potential against their opponents. FIFA ranking is a strong determinant to grouping national teams for tournaments. This ensures that those teams are seeded in international competitions due to their achievements via sporting successes. High international ranking promotes team value in their respective sporting, confederation and continental identity. It reflects the caliber of players the team had produced or continues to produce in the football sector. High-ranking teams enjoy socioeconomic value addition which serves as a catalyst for their sporting and national identity. Acknowledging contradictions in social identity theory and economic theory in explaining the effect of team reputation on performance, Luo, Ge, and Wang (2016) report that good team rank may result in over-complacency which leads to under-performance. We expect team international ranking to have a significant (positive or negative) effect on performance. Based on the teams' international ranking we hypothesize that:

H_4: Team international ranking significantly affects performance in tournaments

In sum, a model for constituting a performing team is built around certain factors which managers/coaches may consider. These indicators combination may contribute significantly to rethink teams' composition in order to achieve the expected performance outcomes in continental tournaments.

2.6. Conceptual framework

The study views team composition from four perspectives. These are; 1) team mix (elite footballers playing domestic and abroad), 2) young talents, 3) team experience, and 4) team international ranking. Figure 1 illustrates the conceptual framework for the study. Collins and Durand-Bush (2015) critically review various theories and frameworks for team processes in sports some of

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Figure 1. Conceptual framework.
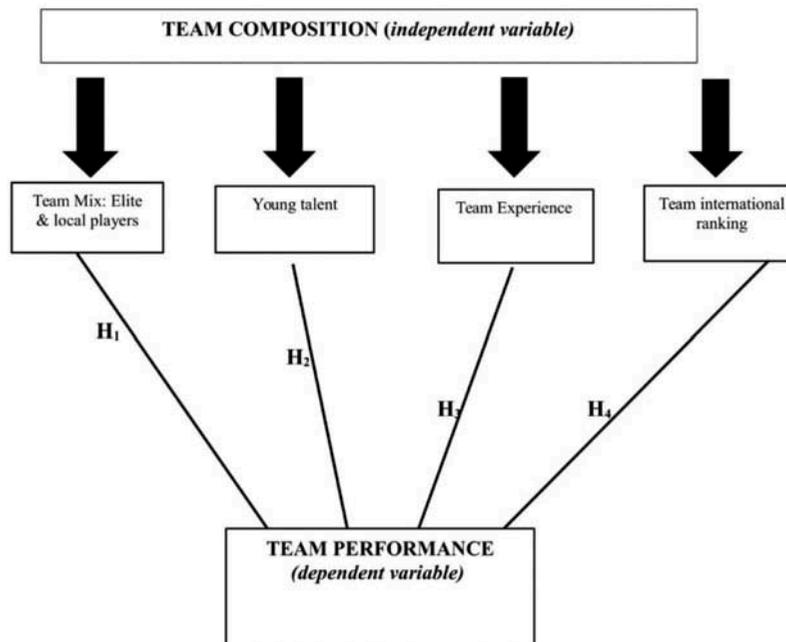
which include the theory of group productivity, the theory of group development and team building framework. They found that team characteristic is vital for performance-based team building. In this study, we argue that young team with foreign and local exposure in elite leagues, experience in the tournament and international ranking increase the probability of winning medals in tournaments. Tournament organizers consider team experience, past performance and international ranking when seeding and grouping teams. Such advantages may propel a team to advance and potentially win medals. For this reason, we suggest a framework that combines team mix, young talent, team experience and international ranking as key determinants of high team performance in continental tournaments.

3. Methods and materials
This is a quantitative study from a deductive approach through the formulation and verification of hypotheses leading to the conclusions of the study. The data, sample, variables, model and estimation techniques are covered under this section.

3.1. Data
The data cover African countries that have participated in the CAF tournaments from 1990 to 2017. National teams that appear in the tournaments have not been static over the period. Previously, the tournament was played in even-yearly intervals but was later changed to odd yearly intervals as a way of giving African teams enough preparation towards the senior World Cup competitions. Thus, 213 observations were made in an unbalanced panel data of countries and time period.

We initially classify Performance (the dependent variable) under four measures. These are winners of gold (1), silver (2), bronze (3) and non-medals (0). In the second stage, we regroup these outcomes into a binary response and re-code all the medal-winning teams as high-performance teams (coded as 1) and then those without medals maintained as zero (0). Teams play qualification series before they participate in tournaments. This enables some countries to make more appearances in the tournaments than others. We assign a discrete measure of the number of appearances made by various countries within the period under review. This measures team experience. Some

countries have made a single appearance, whereas the highest appearance is twenty-three (23) times. We classify average age of the teams into three: youthful (up to 22 years), matured (up to 26 years) and aging (27+ years) as reported by Poli et al. (2015b).

In some of the tournaments, some teams comprised only foreign-based players whilst others had local-based players. Others had equal proportions (perfect mix) or an unbalanced mix of foreign and local-based players. Some players play active football in elite leagues. The ratio of foreign to local-based players and the percentage of active players in elite leagues constitute team mix. We measure team international ranking by the FIFA rankings. The variability of this dataset is wide, so we classified teams into four categories. These are: 1st–30th = highest rank, 31st–60th = higher rank, 61st–90th = high rank and 91st + = low rank. Tables 1 and 2 illustrate the table of medals won by various teams a description of variable responses, respectively.

3.2. Methodology

The main purpose of this study is to investigate how team composition affects the winning potential of national teams in continental matches. The study uses a probit regression model to predict the likelihood of a team winning a medal in a tournament. Probit analysis is based on the cumulative normal probability distribution (Uzunoz & Akcay, 2012), which shows statistically significant estimators that increase or decrease the probability of a team winning a medal in an AFCON tournament. We employed a maximum likelihood estimation to predict whether a team wins a medal.

We propose in our model a binary distribution for performance where if a team won a medal (gold, silver or bronze), it was considered as high performance denoted by 1 and non-medal winning teams were considered as poor performance denoted by 0. The illustration of the model is as follows:

$$\Pr(\textbf{HighPerf} = \textbf{1}) = \Phi(\beta_0 + \beta_1 \textbf{Appear} + \beta_2 \textbf{Age} + \beta_3 \textbf{ForeLoc} + \beta_4 \textbf{ElitePlay} + \beta_5 \textbf{IntRank})$$

(1)

Where:

Pr(HighPerf) is the probability that a team has high performance (wins medal).

Φ is the cumulative normal distribution.

Appear is the number of appearances a team has made in the tournament.

Age is the team average age.

ForeLoc is the ratio of foreign players to local players in a team.

ElitePlay is the percentage of footballers playing in elite clubs abroad.

IntRank is the international FIFA ranking of a team prior to the tournament.

Transforming the binary distribution into an equation for the model to include the error term:

$$Y_{1,t} = \beta_0 + \beta_1 \textbf{Appear}_{1,t} + \beta_2 \textbf{Age}_{1,t} + \beta_3 \textbf{ForeLoc}_{1,t} + \beta_4 \textbf{ElitePlay}_{1,t} + \beta_5 \textbf{IntRank}_{1,t} + \varepsilon_{1,t},$$

(2)

where $Y_{1,t}$ represents performance that wins a medal (gold, silver or bronze).

β represents coefficients of parameters to be estimated.

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Table 1. AFCON medal table					
Country	Appearances	Performance (*number of medals*)			Best FIFA ranking
		Gold (1st)	Silver (2nd)	Bronze (3rd)	
Algeria	17	1	0	0	18
Angola	7	0	0	0	46
Benin	3	0	0	0	59
Botswana	1	0	0	0	94
Burkina Faso	7	0	1	1	35
Cameroun	18	3	1	0	11
Cape Verde	2	0	0	0	32
Congo Demo Republic	18	0	0	2	37
Congo Zaire	7	0	0	0	42
Cote D'Ivoire	22	2	2	1	12
Egypt	23	4	1	0	9
Equatorial Guinea	2	0	0	0	49
Ethiopia	10	0	0	0	93
Gabon	7	0	0	0	31
Ghana	21	0	3	1	16
Guinea Bissau	1	0	0	0	68
Guinea	11	0	0	0	22
Kenya	5	0	0	0	70
Libya	3	0	0	0	36
Liberia	2	0	0	0	73
Mali	10	0	0	2	23
Malawi	1	0	0	0	74
Morocco	16	0	1	0	10
Mozambique	4	0	0	0	68
Namibia	2	0	0	0	68
Nigeria	17	2	2	5	9
Niger	2	0	0	0	93
Rwanda	1	0	0	0	97
Sierra Leone	2	0	0	0	51
Senegal	14	0	1	0	26
South Africa	9	1	1	1	16
Sudan	8	0	0	0	93
Togo	8	0	0	0	46
Tunisia	18	1	1	0	19
Uganda	6	0	0	0	72
Zambia	17	1	1	2	15
Zimbabwe	3	0	0	0	44

4. Results and discussion

4.1. Descriptive statistics

A mean number of appearances was 9.5 with a standard of deviation of 5.5. The least number of appearances was 1 while the highest was 23. The average age of 24.9 approximately 25 years which is within the second category of age group described as a matured group (23–26 years) according to

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Table 2. Description of variable responses			
Variable	Response category	Frequency	Percentage (%)
International ranking	No data	21	9.5
	Highest rank	63	28.4
	Higher rank	78	35.1
	High rank	46	20.7
	Low rank	14	6.3
Age group	Youthful (up to 22years	37	16.7
	Matured (23–26years)	99	44.6
	Ageing (27years +)	86	38.7
Team Performance	Low performance	178	80.2
	High performance	44	19.8
Total		**222**	**100**

Table 3. Descriptive statistics						
Variable	Observations	Mean	Standard deviation	Standard error (mean)	Min	Max
Performance	222	.1981982	.3995432	.0268156	0	1
No of appearances	222	9.5	5.514891	.3701353	1	23
Average age	222	24.91014	1.598151	.1072608	20.8	29.9
Foreign/Local	213	2.823297	4.519501	.3096711	0	22
% of elite players	222	52.39581	27.11002	1.819505	0	100
FIFA rank	222	1.86036	1.052193	.0706185	0	4

Poli et al. (2015b). The minimum and maximum ages are 20.8 and 29.9 years, respectively. National teams from Africa are relatively younger and have low variability as can be seen from the standard deviation and standard error of the mean. Yet, African teams have failed to take advantage of this affecting their performance at the senior FIFA world cup competitions. This creates doubt about their 'true ages' since they tend to be older than they claim to be in leagues abroad (Poli et al., 2015b). We cannot rule out the possibility of other factors impeding team performance such as the history of national teams with regard to the previous AFCON tournaments.

Mean number of foreign to local player ratio is 2.82 (Table 3) which indicates that most teams have a high proportion of foreign players as compared to local ones. Interestingly, some teams are absolutely made up of local players and others solely foreign, while perfect mix (balance) also exists. The mean percentage of elite players is 52.4% with some teams having all their players feature in elite leagues whilst others have none (from the minimum and maximum values). The standard deviation for a percentage of elite players is very high thus indicating the wider variability of the dataset. Majority of elite players' inclusion in a national team promotes individuals' social status and national recognition. This also brings socioeconomic benefits from sponsors that often want to associate with the team's colorful brand.

The correlation matrix (Table 4) shows the association between the variables. Apart from average age, which is not significant with performance, percentage of elite players and foreign/local players, all other correlation coefficients are significant at 95% confidence interval. There is a weak correlation between the independent variables with the highest being less than 0.5 thus indicating no multi-collinearity. Possibly the absence of multicollinearity suggests the independent variables do not

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Table 4. Correlation matrix						
	Performance	Appearances	Average age	% of elite players	FIFA ranking	Foreign/ local players
Performance	1					
Appearances	0.2619*	1				
Average age	−0.0608	0.1642*	1			
% of elite players	0.2964*	0.4512*	0.0357	1		
FIFA ranking	−0.3975*	−0.3112*	−0.1725*	−0.3692*	1	
Foreign/local players	0.1489*	0.3081*	0.0689	0.2723*	−0.153*	1

influence themselves, which is a vital assumption for multivariate analysis. Problems of multicollinearity lead to inflation of standard errors of coefficient estimators resulting in large confidence intervals and smaller t-statistic (Wonsuk, Mayberry, Bae, Karan, Qinghua, & Lillard Jr., 2014).

4.2. Regression analysis

Among the five estimators in the model, four show the significant marginal effect on the performance of national teams. Those that increase the probability of a team winning a medal are the number of appearances and percentage of elite players while the estimators that have a significant inverse relation with the probability of a team winning a medal are average age and FIFA ranking.

On the relationship between team experience and performance, the results of the probit regression indicate that the probability of a team winning medals in continental tournaments is significantly ($p < 0.05$) increased by the number of appearances made. The average number of appearances that increase a national team's chances of winning a medal in a tournament is at least nine (9) times. Apart from Burkina Faso that has made seven (7) appearances and has won two medals (silver and bronze each), all other medal winning countries have made at least nine (9) appearances. Countries such as Egypt, Cameroun, Cote D'Ivoire and Nigeria that have won most gold medals (from 1990–2017) have made between 17 and 23 appearances in the tournament since its inception. It engenders the national identity of those countries and qualification to AFCON tournaments may guarantee medals. Between 1957 and 1988, countries like Egypt, Ghana, Congo and Cameroun won most gold medals but only Egypt has been able to sustain their performance to the present. Regular participation in tournaments promotes social interactions and networks of players and further generates sympathizers and fan to rally behind those teams.

Making more appearances guarantees some experience and familiarity with the terrain and nature of the tournament. This reflects exactly the past times of Cameroun, Egypt and Nigeria. From the AFCON history, Egypt has won the most gold medal (seven out of the 31 competition organized so far). Practice over a long period of time increases team and individual performance (Ericsson, 2006). Even though Ericsson explains further a non-linear relationship between experience and performance, he emphasizes a strong relationship between the variables. Teams need to obtain some optimal level of experience before they can translate into positive returns on performance. It is reported that more familiar teams exhibit good teamwork and better performance than less familiar agents who seem new to the terrain of performance (Bel, Smirnov, & Wait, 2015). It is not just a matter of mere accumulation of years but also deliberate engagement in the activity of practice that produces high performance. In the case of continental football tournaments, this study finds an average of at least nine years' participation in the tournaments, beyond which a team can begin to see results (winning of medals).

From Table 5, the results show that young talent (team average age) significantly determines the probability of a team winning a medal in continental tournaments. An inverse relationship is

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Table 5. Probit regression results						
Performance	**Coef.**	**Std. Err.**	**z**	**p > z**	**[95% conf. interval]**	
					Min	**Max**
Appearances	0.0543668	0.024108	2.26	0.024**	0.007116	0.1016175
Average age	−0.3622813	0.1704719	−2.13	0.034**	−0.6964	−0.0281626
Foreign/local players	0.0094262	0.0221623	0.43	0.671	−0.034011	0.0528635
% of elite players	0.0101093	0.0050764	1.99	0.046**	0.0001597	0.0200589
FIFA ranking	−0.7294809	0.1514618	−4.82	0.000***	−1.02634	−0.4326213
_cons	−0.1645755	0.5673114	−0.29	0.772	−1.276486	0.9473345
Log likelihood		−75.410101				
LR Chi^2 (5)		57.84				
Prob > Chi^2		0.000				
Pseudo R^2		0.2772				
Number of observations		213				

Iteration 0: log likelihood = −104.32973
Iteration 1: log likelihood = −77.460021
Iteration 2: log likelihood = −75.430721
Iteration 3: log likelihood = −75.410108
Iteration 4: log likelihood = −75.410101

*** = $p < 0.001$, ** = $p < 0.05$.

reported from the probit regression which explains 36% of the probability of high team performance and significant ($p < 0.05$). This means that team performance diminishes as its average age increases. The overall average for the distribution is peaked around the second category (25 years) which is described by Poli et al. (2015b) as a matured group which covers the ages of 23–26 years.

Young talent tends to have an influence on the overall team performance in competitions. This also supports team chemistry as significant in team performance (Bel et al., 2015). In addition to players' sporting characteristics, their cultural values and norms are essential as they can help in enhancing the collective team effort. Young talent can serve as a useful indicator for managers/coaches to target players with different characteristics to fit into the scheme of operations and team playing philosophy.

One of the two variables of team mix (percentage of elite players) significantly ($p < 0.05$) increases the probability of teams' high performance in tournaments (see Table 5). The dominance of elite clubs is evident in all major leagues thus reflecting players who have more playing time in such elite leagues (Carmichael, Thomas, & Ward. 2000). It is not enough to play in a foreign club, but regular playing time in elite leagues is essential. We confirm earlier research by Allan and Moffat (2014) that teams benefit from recruiting players plying their trade in stronger leagues. A kind of social stratification of clubs is revealed in this study which significantly increases team performance in competitions (Poli et al., 2015b).

Team mix analysis was based on putting individual talents at the service of the collective effort. This according to Poli et al. (2015b) gives key significance to the human qualities of players during the assembling of a team which often impact positively on team performance. Thus, building a national team around elite players abroad adds quality and international experience to the team which can also improve their team performance at competitions. Thanks to the revocation of the CAF 1982 rule paving way for more participation of foreign-based players. This benefitted national teams with foreign-based players in the elite leagues of France, England, Germany, Spain and Italy. Also, it ensures that the various departments of the game are strengthened to produce the most effective outcomes for teams in competitions. Team mix prepares players to have social

interaction to fully integrate (Briner, 1999) and this can positively affect performance, because the sociocultural dimensions of players are relevant since they contribute to improving individual performance within the team.

In effect, coaches/managers must consider the key indicators that contribute to pitch performance for teams (Poli, Ravenel, & Besson, 2014). This constitutes a major part of professional players' competencies particularly those in elite leagues by making them attractive to clubs, scouts, sporting directors, and coaches or managers. It increases players' economic earnings and social status in their communities and beyond. This provides useful information for coaches/managers in selecting players by considering their technical capabilities, tactics adaption and technical profile to complement collective team efforts.

The results from Table 5 show that international ranking by FIFA significantly ($p < 0.01$ at 95% confidence interval) affects the probability of a team winning a medal in a tournament. This adds to the team's international recognition and social attraction to society that massively patronizes their matches. From the history of the game, the international ranking was not prominent in the early stages of AFCON until 1993 and has since played a significant role in teams' performance. There is no low-ranked team that has ever won a medal in continental tournaments during the period under review. At least all teams that have won medals are in the Tier II ranking domain. Apart from Burkina Faso and CDR (ranked in Tier II), all the others are highly ranked by FIFA. Sporting success of a team reflects a formidable team composition, which contributes to their team ranking build-ups.

Further, international ranking helps to identify their positions on the FIFA ranking which explains the overall best performance of national teams for the period. Sometimes, the position of teams in international ranking tends to influence their performance and also put a sort of fear in their opponents. High ranking can also be dysfunctional (as reported in this study) if a team becomes complacent. There is a significant negative marginal effect of team international ranking on team performance as can be seen in Table 5. This is contrary to earlier findings where Bel et al. (2015) report that a team of journeymen will beat a team of champions because of higher incentives to perform at training and games.

5. Conclusion

The study sought to answer the question of which team composition factors affect the chances of national teams' performance in tournaments. Tracing the history of the tournament since its inception and using data from 1990–2017 of AFCON when international football transformed with its associated socioeconomic opportunities, we analyzed how national teams' managers or coaches can assemble formidable winning teams in continental tournaments. All four hypotheses stated in the conceptual framework were supported. Overall, team composition has a 28% marginal effect on the probability of a team winning a medal in a continental tournament.

A winning team has more to its composition along four dimensions. Team experience is acquired by more appearances in the tournament which guarantee familiarity with the terrain and nature of the tournament. This coupled with considerable practice time increases individual and collective efforts of teams. It is useful for the team to achieve some level of experience since it has positive effects on performance. The objective value of team experience is an average of at least nine years of participation, beyond which a team stands a better position to win a medal in such continental tournaments. Team mix goes beyond mere assembly of foreign and local players. Active participation in elite leagues is vital. Teams with players who feature in elite clubs have better medal winning potential than otherwise. Facilities and training regimes in such clubs put players ahead of their peers and are able to brace themselves up for tournaments given the relatively shorter camping periods. Young talent determines the medal-winning prowess of a team for continental tournaments. An age group described as matured (less than 26 years) has strength and stamina to ensure high performance, while aging teams (27 years and above) have minimal chances of winning medals. International

ranking contributes significantly to a team's chances of winning medals in tournaments. Teams highly ranked by FIFA are better medal winners in tournaments than low-ranked teams but complacency can ruin such potential. This makes the international ranking of teams not completely an asset to team performance. Those identified characteristics promote national team identity and create socioeconomic opportunities for both players and managers with enhanced national recognition.

Our study adds to the literature on the subject and concurrently, provides team managers, performance analysts and match pundits with useful information on some elements to consider when inviting players to form a national team for continental tournaments. We do not refute the role of motivation in team performance but uncover a neglected area which is team composition.

Our approach developed in this empirical evaluation has a diverse impact for stakeholders of the game. Stakeholders can rely on these identified dimensions that support team composition to affect the winning potential of national teams. The study opens a grey area for further research which focuses on holistic determinants of high team performance, selection of players based on physiological factors and socio-cultural factors.

Decision-making problems in sports management (such as team formation) which is a major headache in the discipline are addressed by this write-up. From the statistical description and theoretical models, we concluded that a team composition of more professional players from elite leagues abroad provides a good team balance capable of achieving desirable results in continental tournaments. Thus, the probability of a team winning a medal in continental tournaments must consider the number of appearances in international competitions, international ranking, young matured talent and more active professional players in elite leagues abroad.

6. Limitations
The generalisability of the findings is not doubtful even though there are few limitations. Data were unavailable for certain variables in some years, which reduced the number of observations and made the panel unbalanced. There was no concrete data on professional migrant players for the periods before the 1990s since most Africa communities had then not seen football as a professional activity. However, these do not cast any doubt on the findings and their generalizability because the model satisfied all the necessary assumptions and tests.

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References
Acheampong, E. Y. (2017). *Socioeconomic Analysis of the Give Back Phenomenon: Professional Footballers in Europe and their assistance to the communities of origin in Africa* (Doctoral dissertation), Université Grenoble Alpes, France.
Acheampong, E. Y., & Bouhaouala, M. (2019). African footballers' life cycles according to the analysis of transfer value along their career path: A case study of Ghanaian players. *Sport in Society*, 1–21. doi:10.1080/17430437.2018.1551366.
Acheampong, E. Y., Bouhaouala, M., & Raspaud, M. (2013, October). *Influence of African professional players on AFCON tournaments*. Paper presented at the 15th ACAPS congress in Grenoble, France.
Alegi, P. (2010). *African soccerscapes: How a continent changed the world's game*. Athens: Ohio University Press.
Allan, G. J., & Moffat, J. (2014). Muscle drain versus brain gain in association football: Technology transfer through player emigration and manager immigration. *Applied Economics Letters*, 21(7), 490–493. doi:10.1080/13504851.2013.870641
Alvarez, J., Forrest, D., Sanz, I., & Tena, J. D. (2011). Impact of importing foreign talent on performance levels of local co-workers. *Labour Economics*, Elsevier B.V. 18(3), 287–296. doi:10.1016/j.labeco.2010.11.003
Armstrong, G. (2004). The migration of the black panther: Interview with Eusebio of Mozambique and Portugal. In G. Armstrong & R. Guilianotti (Eds.), *Football in Africa: Conflict, Conciliation and Community* (pp. 247–266). New York: Palgrave Macmillian.

Arnason, A., Sigurdsson, S. B., Gudmundsson, A., Holme, I., Engebretsen, L., & Bahr, R. (2004). Physical fitness, injuries, and team performance in soccer. *Medicine and Science in Sports and Exercise*, *36*, 278–285. doi:10.1249/01.MSS.0000113478.92945.CA

Augste, C., & Lames, M. (2011). The relative age effect and success in German elite U-17 soccer teams. *Journal of Sports Sciences*, *29*, 983–987. doi:10.1080/02640414.2011.574719

Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology*, *90*, 1054–1068. doi:10.1037/0021-9010.90.6.1054

Bel, R., Smirnov, V., & Wait, A. (2015). Team composition, worker effort and welfare. *International Journal of Industrial Organization*, *41*, 1–8. Elsevier B.V doi:10.1016/j.ijindorg.2015.04.002

Bell, S. T., & Brown, S. G. (2015). *Selecting and composing cohesive teams*. Bingley, UK: Emerald Group Publishing Limited.

Berlinschi, R., Schokkaert, J., & Swinnen, J. (2013). When drains and gains coincide: Migration and international football performance. *Labour Economics*, *21*, 1–14. doi:10.1016/j.labeco.2012.12.006

Briner, M. (1999). *Learning theories*. Denver: University of Colorado.

Carmichael, F., Thomas, D., & Ward, R. (2000). Team performance: The case of English premiership football. *Managerial and Decision Economics*, *21*, 31–45. doi:10.1002/(ISSN)1099-1468

Collins, J., & Durand-Bush, N. (2015). Frameworks of team processes in sport: A critical review with implications for practitioners. *International Journal of Human Movement and Sports Sciences*, *3*, 46–59. doi:10.13189/saj.2015.030304.

Darby, P. (2010). 'Go Outside': The history, economics and geography of ghanaian football labour migration. *African Historical Review*, *42*(1), 19–41. doi:10.1080/17532523.2010.483793

Darby, P. (2014, January). International football migration and Africa: Feet drain or feet exchange. In *More than a game, sport, society and politics* (pp. 71–78). Panorama Insights into Asian and European Affairs.

Dierdorff, E. C., Bell, S. T., & Belohlav, J. A. (2011). The power of "we": Effects of psychological Collectivism on team performance over time. *Journal of Applied Psychology*, *96*, 247–262. doi:10.1037/a0020929

Eby, L. T., & Dobbins, G. H. (1997). Collectivistic orientation in teams: An individual and group level analysis. *Journal of Organizational Behavior*, *18*, 275–295. doi:10.1002/(ISSN)1099-1379

Ericsson, K. A. (2006). The influence of experience and deliberate practice on the development of superior expert performance. In *The Cambridge handbook of expertise and expert performance* (Chapter 38) (pp. 683–704). Cambridge: Cambridge University Press.

Eugene 'Gusty' Cooper, A., Jr. (2011).The African football development model. *The Interdisciplinary Electronic Journal of African Sport*, *7*. Ohio University.

Filho, E., Gershgoren, L., Basevitch, I., & Tenenbaum, G. (2014). Profile of high-performing college soccer teams: An exploratory multi-level analysis. *Psychology of Sport and Exercise*, *15*(5), 559–568. doi:10.1016/j.psychsport.2014.05.008

Fisher, D. M., Bell, S. T., Dierdorff, E. C., & Belohlav, J. A. (2012). Facet personality and surface-level diversity as team mental model antecedents: Implications for implicit coordination. *Journal of Applied Psychology*, *97*, 825–841. doi:10.1037/a0027851

Forrest, D., & Simmons, R. (2002). Team salaries and paying success in sports. A comparative perspective. *Zeitschrift für Betriebswirtschaft*, *62*, 221–237.

Franck, E., & Nüesch, S. (2010). The effect of talent disparity on team productivity in soccer. *Journal Of Economic Psychology*, *31*(2), 218–229. doi:10.1016/j.joep.2009.12.003

Hackman, J. R. (2012). From causes to conditions in group research. *Journal of Organizational Behaviour*, *33*, 428–444. doi:10.1002/job.1774

Hoffmann, R. L., Chew, G., & Ramasamy, B. (2002). The socio-economic determinants of international soccer performance. *Journal of Applied Economics*, *5*, 253–272. doi:10.1080/15140326.2002.12040579

Hoffmann, R. L., Ging, L. C., & Ramasamy, B. (2002). The socio-economic determinants of international soccer performance. *Journal of Applied Economics*, *5*, 253–272. doi:10.1080/15140326.2002.12040579

Huckman, R. S., Staats, B. R., & Upton, D. M. (2009). Team familiarity, role experience, and performance: Evidence from Indian Software Services. *Management Science*, *55*(1), 85–100. doi:10.1287/mnsc.1080.0921

Jackson, C. L., Colquitt, J. A., Wesson, M. J., & Zapata-Phelan, C. P. (2006). Psychological collectivism: A measurement validation and linkage to group member performance. *Journal of Applied Psychology*, *91*, 884–899. doi:10.1037/0021-9010.91.4.884

Jenkins, R. (1990). On the renaissance of Arthur Wharton's sporting career in England: Salvation for the fittest? A west African sportsman in Britain in the age of the new imperialism. *International Journal for the History of Sport*, *7*, 23–60. doi:10.1080/09523369008713711

Lanfranchi, P., & Taylor, M. (2001). *Moving with the ball: The migration of professional footballers*. Oxford: Berg.

Lucifora, C., & Simmons, R. (2003). Superstar effects in sport: Evidence from Italian soccer. *Journal of Sports Economics*, *4*, 35–55. doi:10.1177/1527002502239657

Luo, X., Ge, L., & Wang, L. (2016). The impact of team ranking on team lending performance: An empirical study on Kiva. *Aisel.Aisnet.Org*. Pacific Asia Conference on Information Systems.

Maderer, D., Holtbrügge, D., & Schuster, T. (2014). Professional football squads as multicultural teams. *International Journal of Cross Cultural Management*, *14*(2), 215–238. doi:10.1177/1470595813510710

Mathieu, J. E., Tannenbaum, S. I., Donsbach, J. S., & Allige, G. M. (2014). A review and integration of team composition models moving toward a dynamic and temporal framework. *Journal of Management*, *40*, 130–160. doi:10.1177/0149206313503014

Molleman, E. (2005). Diversity in demographic characteristics, abilities and personality traits: Do faultlines affect team functioning? *Group Decision and Negotiation*, *14*, 173–193. doi:10.1007/s10726-005-6490-7

Morgeson, F. P., Reider, M. H., & Campion, M. A. (2005). Selecting individuals in team settings: The importance of social skills, personality characteristics, and teamwork knowledge. *Personnel Psychology*, *58*, 583–611. doi:10.1111/peps.2005.58.issue-3

Mourao., P. R. (2017). Dissecting the survivors - how the age of a club contributes to the ability of a team to maintain the top position in the European soccer leagues. *Science and Sports*, *32*(4), e163–e171. doi:10.1016/j.scispo.2017.01.008

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Mumford, T. V., Van Iddekinge, C. H., Morgeson, F. P., & Campion, M. A. (2008). The team role test: Development and validation of a team role knowledge situational judgment test. *Journal of Applied Psychology, 93*, 250–267. doi:10.1037/0021-9010.93.2.250

Poli, R., Ravenel, L., & Besson, R. (2014). Paths to club's sustainability. *CIES Football Observatory Monthly Report Issue*, 9 December.

Poli, R., Ravenel, L., & Besson, R. (2015a, September 7). How to build up a team for long term success? The CIES football observatory approach. *CIES Football Observatory Monthly Report Issue*.

Poli, R., Ravenel, L., & Besson, R. (2015b, May 5). Performance analysis: Best clubs and players of the Big 5 leagues season. *CIES Football Observatory Monthly Report Issue*.

Poli, R., Ravenel, L., & Besson, R. (2015c, April 7). Squad Analysis: Who will win the Champions league? The CIES football observatory approach. *CIES Football Observatory Monthly Report Issue*.

Poli, R., Ravenel, L., & Besson, R. (2016, January 11). Squad profile of the best performing national A-teams. *CIES Football Observatory Monthly Report Issue*.

Radnege, K. (1998). *The complete encyclopedia of football*. London: Colour Library Direct.

Randall, K. R., Resick, C. J., & DeChurch, L. A. (2011). Building team adaptive capacity: The roles of sense giving and team composition. *Journal of Applied Psychology, 96*, 525–540. doi:10.1037/a0022622

Scelles, N., & Andreff, W. (2015). Determinants of national men's football team performance 2011– 2013 : What impact of sporting prizes ? In The *64th Association*

Française de Science Economique Congress (pp. 1–20). Rennes, France.

Scoppa, V. (2013). Fatigue and team performance in soccer: Evidence from the FIFA World Cup and the UEFA Championship. *Journal of Sports Economics, 16* (5), 482–507. doi:10.1177/1527002513502794

Sierra-Díaz, M., González-Víllora, S., Pastor-Vicedo, P., & Serra-Olivares, J. (2017). Soccer and relative age effect: A walk among elite players and young players. *Sports, 5*(1), 5. doi:10.3390/sports5010005

Szymanski, S., & Kuypers, T. (1999). *Winners and Losers: The business strategy of football*. London: Penguin.

Tavana, M., Azizi, F., Azizi, F., & Behzadian, M. (2013). A fuzzy inference system with application to player selection and team formation in multi-player sports. *Sport Management Review, 16*(1), 97–110. doi:10.1016/j.smr.2012.06.002

Uzunoz, M., & Akcay, Y. (2012). A case study of probit model analysis of factors affecting consumption of packed and unpacked milk in Turkey. *Economics Research International*, 1–8. doi:10.1155/2012/732583

Vasili, P. (1998). *The first black footballer, Arthur Wharton,1886–1930. An absence of memory*. London and Portland: Frank Cass.

Wonsuk, Y., Mayberry, R., Bae, S., Karan, S., He Qinghua, P., & Lillard, J. W., Jr. (2014). A study of effects of multicollinearity in the multivariable analysis. *International Journal of Applied Science Technology, 4* (5), 9–19.

Zaccaro, S. J., & DiRosa, G. A. (2012). *The processes of team staffing: A review of relevant studies*. London: John Wiley & Sons, Ltd.