SOCIETY OF ACTUARIES

UNSW SYDNEY

2022 SOA STUDENT RESEARCH CASE STUDY CHALLENGE

Building the Rarita Football Brand

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CONTROL CONSULTING

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Objective of Analysis

Football is a sport loved and played by billions worldwide. Beyond this, football can provide countries with opportunities for economic gain, global visibility and improved social outcomes.

In recognizing this, the country of Rarita has engaged our team to develop a strategy for entering the international Football and Sporting Association ("FSA") League and develop a Rarita Football brand.

This report dissects the process of team selection which involves identifying key selection criteria and then applying it through a predictive model to select the most competitive team. The revenues generated by the successful team can then be re-invested in local sporting programs and facilities and purchase of better players which then creates a cycle of improved future team performance.

Ultimately, through our team selection and implementation strategies, we expect Rarita to achieve the below three objectives and successfully develop a Rarita Football brand over the next ten years.

Figure 1: Key Objectives for the Rarita Football Team

Criteria for Selection

A variety of quantitative and qualitative criteria are utilized to select Rarita's national team. These criteria are applied to the league datasets, with averages of values taken across 2020 and 2021 should player data exist for both.

Soccer Power Index

The primary selection criteria is maximizing the Soccer Power Index (SPI), an international rating system compiled by ESPN. The SPI rating is designed to provide the best possible objective representation of a team's current overall skill level and aims to predict which teams will have the most success going forward (Silver, 2009).

To assign an SPI to each player, we have developed a model using current SPI and player data from the past 5 seasons of the English Premier League (EPL). This formed our training dataset, and the tournament data and results was used as a testing dataset. This is detailed in Appendix A1.

In constructing the model, we have selected the key metrics that measure a player's performance in each position (see Appendix A2). These are based upon the performance indicators listed below (Hughes, 2012):

Table 1: Player Performance Indicators

PERFORMANCE INDICATORS	GK	Full Backs	Centre Backs	HM	AM	WM	Strikers
Physiological	Height Strength Power Agility Coordination Reaction Time	Speed Power Stamina	Height Strength Speed Power Stamina	Stamina Speed Power Strength	Stamina Speed Power Strength	Speed Stamina Power Strength	Speed Agility Power Strength Stamina
Tactical	Vision Organisation Communication Distribution	Support play When to cross Passing Running off the ball Forcing offside	Vision Organisation Communication Passing	Vision Organisation Communication	Vision Organisation Communication	Vision Organisation Communication	Vision – awareness of space Anticipation Organisation Communication
Technical – Def	Shot stopping Coordination Recovery speed Save Punch	Tackle Pressing opposition Interception – anticipation Clearance Defensive header	Tackle Defensive header Pressing opposition Interception – anticipation Clearance	Tackle Pressing opposition Interception – anticipation Heading	Tackle Pressing opposition Interception – anticipation Heading	Tackle Pressing opposition Cover full-back Interception – anticipation Heading	Tackle Pressing opposition Interception – anticipation Heading
Technical – Att	Passing Throw Ball control with feet Kick Tackle	Tackle Interception – anticipation Dribbling Running with the ball Clearance Defensive header	Passing Heading Running with the ball Support play Dribbling Crossing Shooting	Passing Running with the ball Dribbling Support play Crossing Shooting Heading	Passing Running with the ball Dribbling Support play Crossing Shooting Heading	Passing Running with the ball Dribbling Support play Crossing Shooting Heading	Shooting Heading Reception Dribbling Passing Running with the ball Support play Crossing
Psychological	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language	Concentration Motivation Attitude Body language

GK – Goal Keepers; HM – Holding Midfield; AM – Attacking Midfield; WM – Wide Midfield.

Team Composition

The other primary selection criteria is the team composition, the lineup being 1 goalkeeper, 4 defenders, 4 midfielders and 2 forwards. This reflects the France national team who won the 2018 FIFA World Cup (Scott, 2018). To ensure sufficient substitutes, 28 players are selected (common number in EPL teams). This is composed of 2 goalkeepers, 10 defenders, 10 midfielders and 6 forwards.

- **Salary**
  - We have aimed to minimize salary costs where possible without jeopardizing the performance of the team to maximize economic gain.
- **National identity**
  - Players from Rarita and the Rarita Football League were prioritized due to the socio-economic impact a successful player can have on their nation (see Appendix A3).
- **Team chemistry**
  - Where possible, players from similar squads are selected to promote team chemistry in the early years of Rarita's national team.
- **Experience**
  - Football experience is critical for a well-rounded and realistic view of player performance. The main indicator of experience is minutes played and this was taken as the primary variable.
  - A player's position in the higher leagues increases competition which may offset lower performance indicators. As a result, A and B league players were prioritized in each position where possible.
  - Previous participation and success at a tournament level would provide experience in performing in a high-stake environments and handling pressure. We have prioritised players from the top 3 nations in previous tournaments, which were Sobianitedrucy, Dosqaly, People's Land of Maneau and Nganion.
- **Age**
  - To facilitate growth, we have still considered younger players with considerable talent to promote long-term success over the 10 years.

Using the selection criteria outlined, Rarita's National Team for the next 10 years is constructed. See the full Rarita's national team list in Appendix A3.

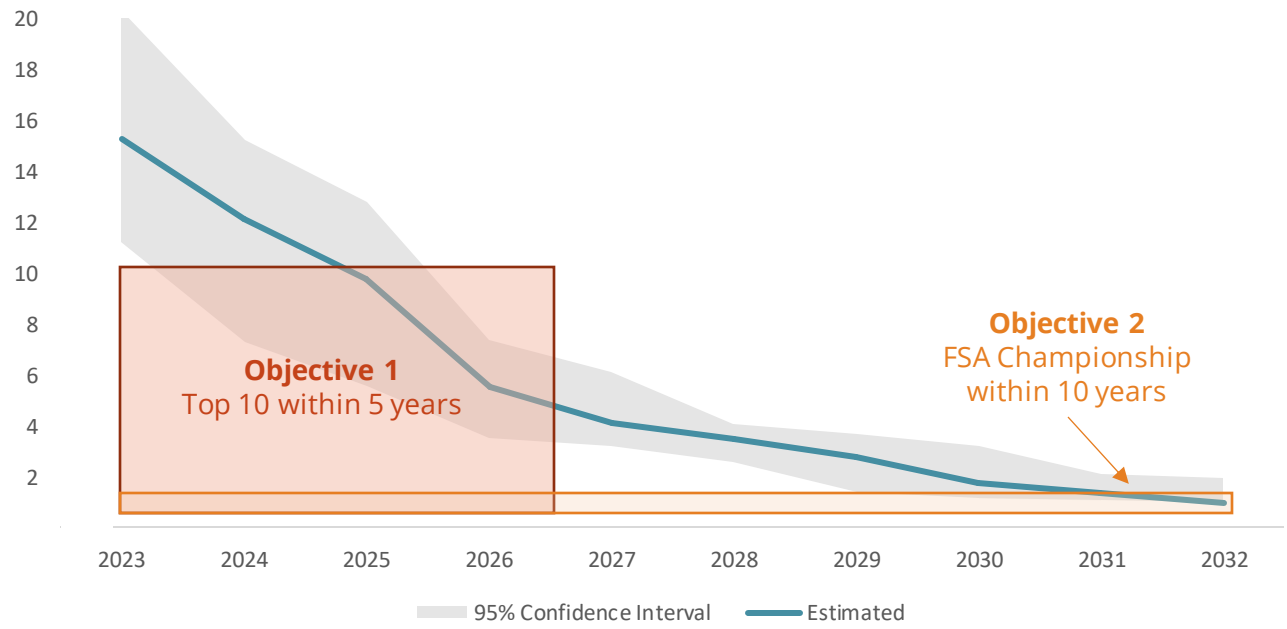
Probability of Success

Following the selection of Rarita's national team, it was assumed that remaining national teams remained the same for the following years. Using expected goals and assuming goal distributions follow a Poisson distribution, an international tournament was simulated. It was assumed that the international league was similar to the EPL, with each team playing every opponent twice, once on home grounds and once on international grounds. Furthermore, each match would award fixed points for wins, losses, and draws, with rankings determined by the point distribution at the end of the season.

Through a 10,000-fold Monte-Carlo simulation, we were able accurately estimate probability distributions for Rarita's end-of-season ranks. Finally, Rarita's objectives for the next 5 and 10 years were modelled using a Binomial distribution, which indicated that our chosen team has a 98% chance of placing within the top 10 in the next 5 years, and a 31.4% chance of placing first within the next 10 years.

However, it is important to note that due to limited data, it was assumed that all national teams, including Rarita remain constant over the 10-year period modelled. Thus, due to a limited budget and general lack of experience of our players, the estimated probabilities are conservative in nature and are expected to steadily improve over the years following the implementation of our football programs detailed in the following sections.

Figure 2: Projected Team Ranking – 95% Confidence Interval



Profit Analysis

The revenue and costs associated with the successful operation of the Rarita national football team is illustrated below. For further breakdown, refer to Appendix A9.

Figure 3: Average Annual Revenue and Costs Breakdown

Revenue

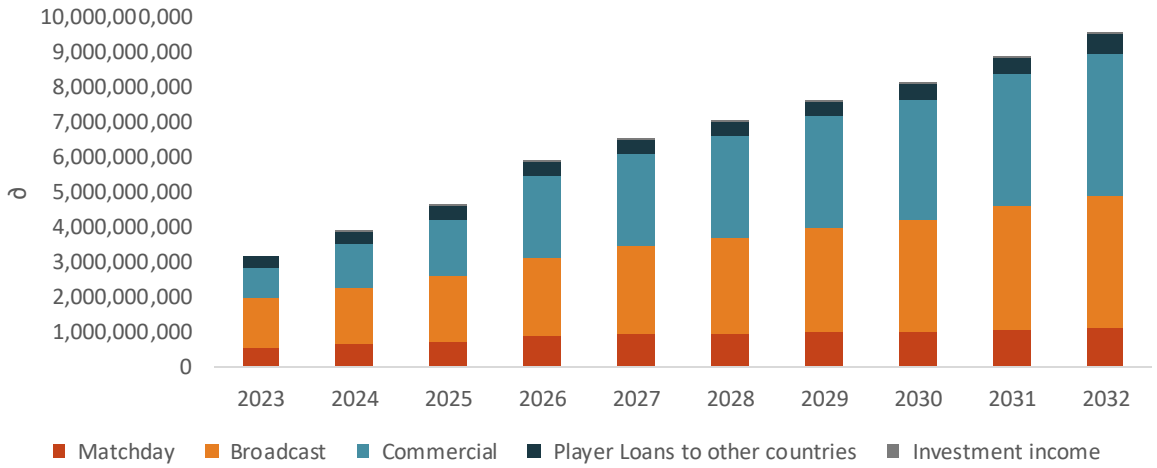
- Player Loan-out: 140,740,229 ð
- Matchday: 870,186,985 ð
- Broadcast: 3,250,175,926 ð
- Commercial: 2,397,934,645 ð
- Investments: 23,298,336 ð

Costs

- Football Players: 352,371,273 ð
- Support Staff: 761,859,652 ð
- Player Loans: 28,558,553 ð
- Facility: 410,600,000 ð
- Player Development: 243,968,834 ð

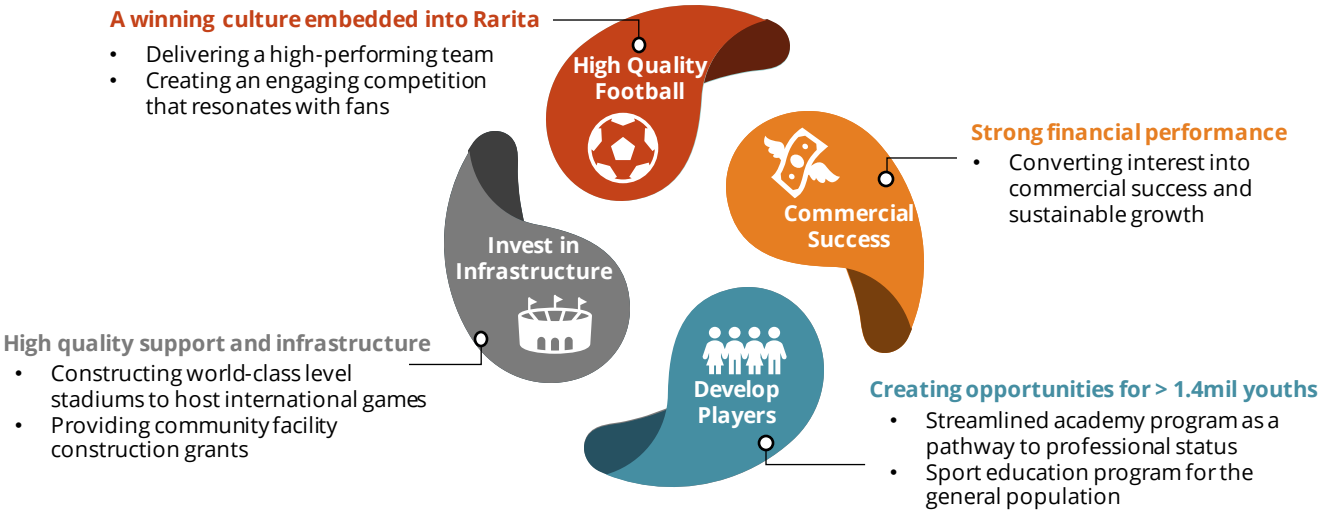
Our strategy generates a projected total revenue of approximately 69,729,968,394 ð over the next decade. Our projections are largely contingent on achieving the first two key objectives relating to the performance in the FSA league because as a country increases in ranking, greater publicity led to increases in tickets sold, commercial activity and broadcasting demand (Appendix A6). A portion of the difference between the profits and the following years' expected profits are passively invested in government bonds to generate safe additional revenue.

Figure 4: 10-year projection of revenue



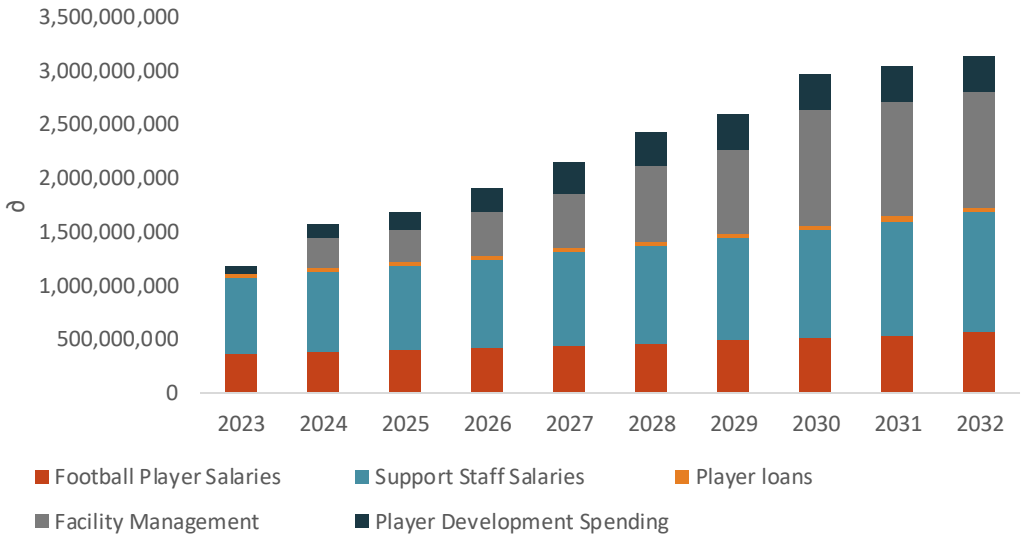
The appropriate expenditure of the revenue generated by the successful performance of the Rarita national football team can create positive socio-economic impact for all stakeholders, support risk mitigation strategies and further improve the quality of the Rarita players, thus forming a continuous cycle of growth.

Figure 5: Cycle of Strategic Growth



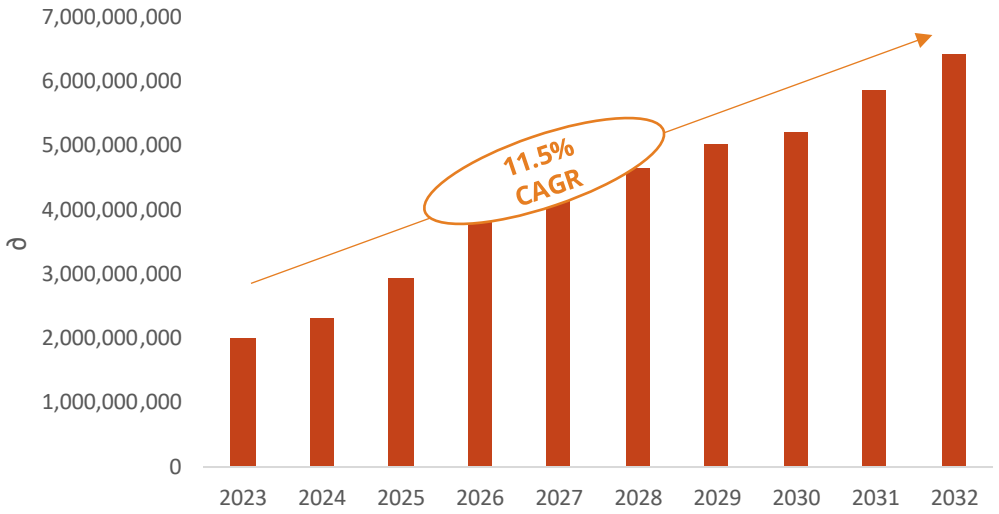
Our strategy generates a projected expense of roughly 27,828,954,388 ∂ over the next decade through two expenditure programs, 'Football for All' and 'Home of Football', whose implementation is outlined in the following sections. Much of the spending is discretionary and can be adjusted based on the team's performance and community demand. Allocation of expenses will focus on regions with lower GDP and GNI such as West Rarita (Appendix A7) by distributing investment on an equal and needs-assessed basis.

Figure 6: 10-year Projection of Expenses



In the first year, expenses are 1,063,005,000∂ which is close to the 995,000,000∂ initial grant to ensure financial viability. As expenses are incurred over the year, we expect revenues from operations and sponsorships to make up for the shortfall between expenses and the initial grant. Profits are ensured to be positive and sufficient to cover expenses. Hence, our strategy is expected to be financially sustainable and generate significant profits of 41,786,460,433 ∂ over the next decade.

Figure 7: 10-year Projection of Profits



Socio-Economic Impact

Beyond just a sport, football has the capacity to generate significant economic and social returns for participating countries.

For our analysis, we have used the GROW SROI model developed by the Union of European Football Associations (UEFA) which has been applied to over 60 countries' national and local football programs (UEFA, 2020 – for methodology and modelling, refer to Appendix A12).

The Rarita national football program is estimated to generate an average annual benefit of ∂11,640 mil to Rarita (Appendix 12). The SROI ratio of ~4.7 indicates that for every 1∂ invested, there is more than ∂4.7 worth of socio-economic benefits for the wider Rarita community. We aim to distribute these benefits evenly across the Rarita regions and bridging socio-economic inequality through resource allocation and policy development.

Figure 8: Average Annual Socio-Economic Impact

The economic benefit stems from the economic value of football consumption and employment, economic activity associated with facility management and tax contribution from football staff and players. This results in an average annual ~1.2% GDP uplift. The construction and tourism industry are expected to receive notable boosts in economic activity, 379mil ∂ and 492mil ∂ respectively (refer to Appendix A13 for a detailed breakdown).

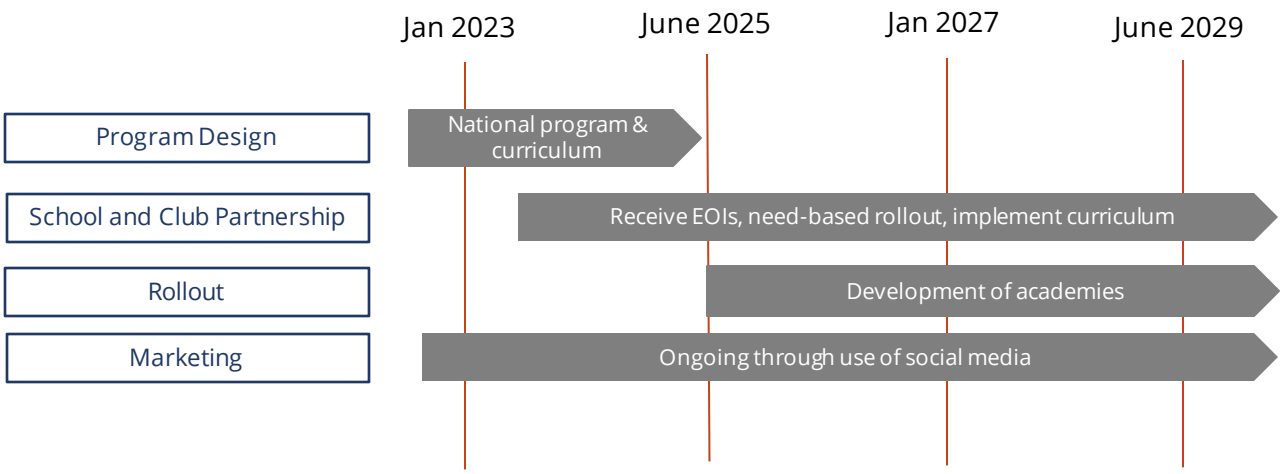
The health benefits represents the personal benefits for participants as increased sporting activity is linked to lower probability of health conditions. This shows the benefits of a healthier population and the health system savings.

The social benefits highlights increased human capital with sport participation, reduced crime and broader community benefits of football. This demonstrates the potential uplift of personal and community benefits that can arise from greater football activity.

Football for All

The Football for All program aims to train future players and create opportunities for all. We will develop a streamlined national program that supports all ages through training, funding support and equal access across regions. This involves establishment of professional academies and a curriculum-linked football education program in partnered Rarita schools.

Figure 9: Football for All Implementation Plan



Metric	Frequency	Targets
Number of participants	Annually by survey – to determine number to fund	8000 schools, 200 clubs
Engagement	Annually by survey – to identify any necessary changes to program	70% participation rate, 80% satisfaction
Expenditure	Monthly – to control costs and maintain budget	Within budget as outlined in Financials

The outcome of the program is to develop football academies that promote competition within Rarita and improve the competitiveness of the national team. Similarly, the program will promote football across the nation to increase the economic benefits of a competitive football team.

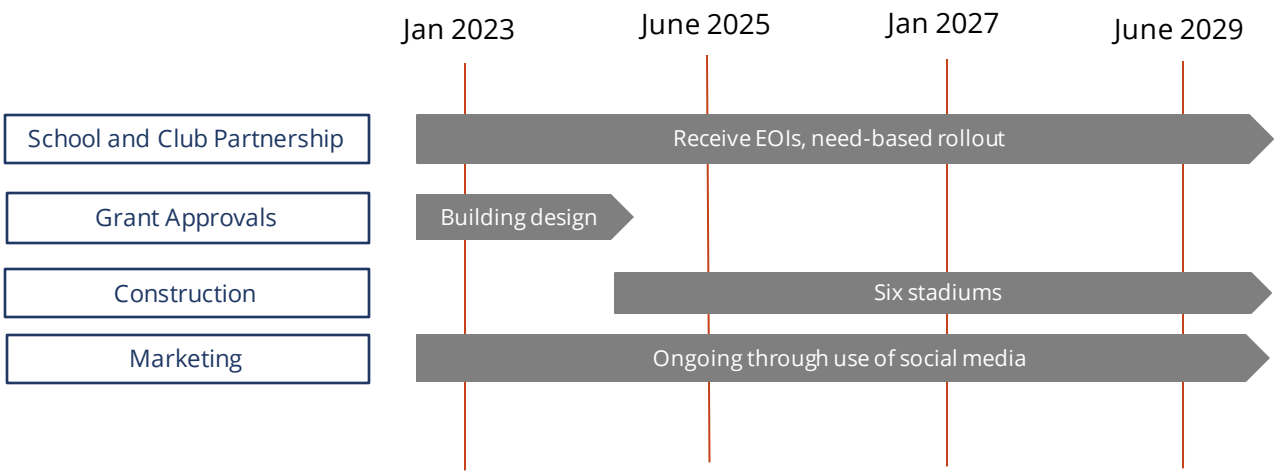
Home of Football

The Home of Football program involves two parts.

Local football communities will be able to develop infrastructure for player devleopment through a grant system. A needs-based approach will be employed to ensure parity across the regions of Rarita.

The program also aims to develop six world-class football stadiums (construction schedule in Appendix A9) in all four regions to improve neighboring hospitality and transport infrastructure with an opportunity to uplift poorer regions of Rarita. The objective is to host the FSA tournament within the next 10 years, with further revenue opportunities through renting out the stadiums and hosting future matches.

Figure 10: Home of Football Implementation Plan



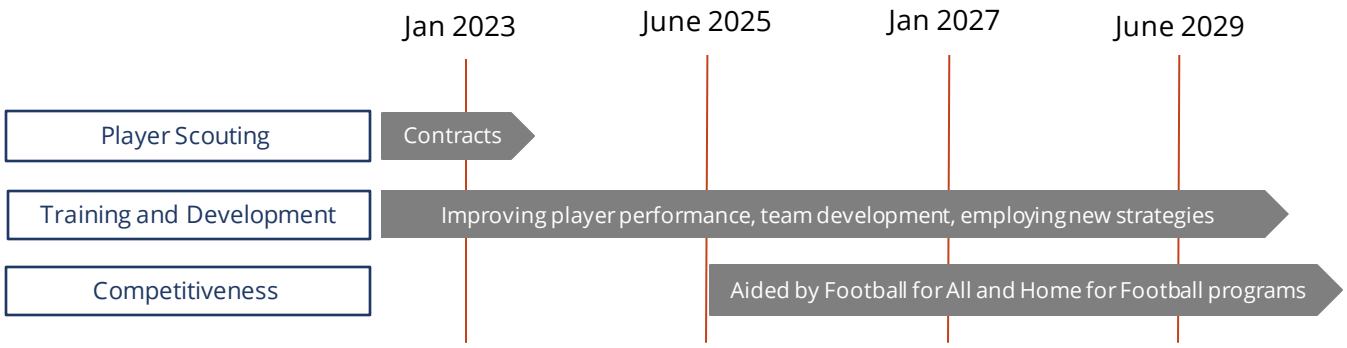
Metric	Frequency	Targets
Utilisation rate	Annually by survey – to determine number to fund	8000 schools, 200 clubs
Demand for infrastructure	Annually by survey – to identify any necessary changes to program	70% participation rate, 80% satisfaction
Tournament bid success	Biannually – to identify missing criteria to be met for the bid	Win bid by 2026
Expenditure	Monthly - to control costs and maintain budget	Within budget as outlined in Financials

Team Selection

The initial phase will be signing contracts with our chosen players. The training and development of the team will be an ongoing process to work towards our objectives, and is aided by a selection of both experienced and talented players and investing into high quality staff. The 28-player squad will also open opportunities to determine the most optimal lineup and variations across the decade.

The Football for All and Home for Football programs will also directly impact the competitiveness of the national team through a more developed football culture and enhanced facilities. Furthermore, the introduction of various academy programs will provide future sources of players and promote player development.

Figure 11: Team Selection Implementation Plan



Metric	Frequency	Targets
Objectives	Annually – tournament results	Top 10 within 5 years, high probability of winning within 10 years
Competitiveness of national team	Annually – league results	Players of Rarita national team increase in performance indicators from year-to-year
Competitiveness of academy programs	Annually – tryouts for national team	Players from Football for All's academies are comparable to national players

Several risks which may negatively affect the game and financial performance of the team, including financial, operational, strategic and assumption risks. The list of risks have been compiled in the below matrix:

Figure 12: Matrix of Identified Risks

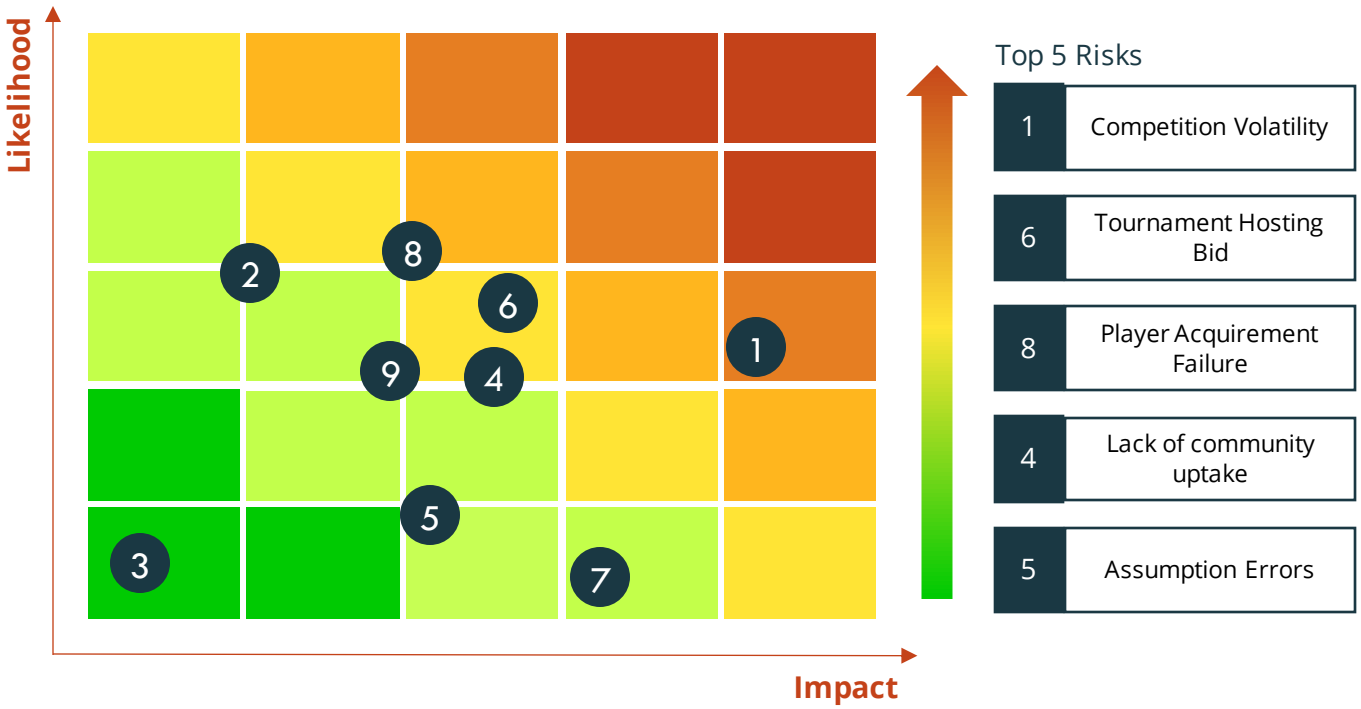


Table 2: Risk Assessment

No.	Risk	Description	Impact	Mitigation
1	Competition Volatility	• Operational risk • Rarita fails to achieve ranking goals in the FSA	• Impacts revenue predictions • Affects infrastructure investment	• Rarita team has high probability of success over next 10 years • Monitor competition and trends
2	Injury, Disablement or Reputation Damage	• External factors (I.e. injuries) affecting players or staff that prevent participation	• Potentially impact team performance • Further effects on team's financial success	• Invested into comprehensive support staff • Promote safe and healthy environment

No.	Risk	Description	Impact	Mitigation
3	Market Risk	• Poor performance of financial instruments	• Impacts revenue and cashflows projections • Subsequent impacts on team performance	• Diversify investment profiles to minimize systematic risk • Invest in safer investments (I.e. bonds)
4	Lack of community uptake	• Overestimate community engagement	• Hinder programs that will reduce future domestic talent and decrease community perception of football	• Programs aimed at raising awareness • Regular surveys to identify any needed changes
5	COVID and Economic Risk	• Large scale economic events (I.e. COVID-19)	• Prevent regular activities • Impacts income streams • Uncertainty for future cashflows • 2020 revenues fell by 15% on average for all countries	• Diversify investment profiles • Vaccinations of players and staff • Digital infrastructure investment
6	Tournament Hosting Bid	• Fail to host FSA tournament at Rarita in 10 years	• Reduce value of 'Home of Football' infrastructure investment program	• Invest in quality stadiums • Infrastructure provides other economic benefits
7	Budgeting Errors	• Errors in budgeting estimations	• Impact future actual cashflows • Overall spending schedule is mismanaged and profit is lost	• Monitor actual vs expected • Make regular adjustments
8	Player Acquirement Failure	• Unable to secure selected players • Inability to perform as expected	• Overestimate team performance	• Competitive contracts with player benefits • Improve talent programs and scouting
9	Assumption Errors	• Incorrect team and financial assumptions	• Over/underestimate profitability	• Revise assumptions based on monitoring experience

For each risk discussed in the table above, there has been a detailed assessment of the impact and mitigation techniques available to help control any monetary or personal issues over the 10-year investment horizon.

Data Limitations and Assumptions

Limited data in modelling and analysis required assumptions to be set. Significant deviations to our set assumptions can have an impact on projections and analysis.

Table 3: Data Limitations and Assumptions

Area	Limitation	Assumptions
Team Selection	• Tournament results limited to 16 (2020) and 24 (2021) countries • Tournament player data incomplete for 2020 (missing passing & defense)	• EPL data over past 5 years used to increase datapoints (exact variable match) • However, EPL is one of the top leagues and might misrepresent players in lower leagues • Risk of over-predicting player SPI

Team Selection	• Data errors:
	  • Negative values
	  • Missing values
		• Imputation methods used including removing data points or setting values to zero
		• However, incorrect data can severely skew the model outputs, particularly since data is scarce

Team Selection	• No data on external factors:
	  • Home-ground advantage
	  • Team chemistry
	  • Coaching team
		• External factors are captured in an individual player's statistics and have limited impact

Probability of Success	• Data was provided for 2 years and no information regarding changes over time • No data provided for other national teams and their agendas	• Assume teams remain constant over next 10 years in the Monte-Carlo simulation • Major deviations could significantly change the outcome of the matches and the future tournament results

Economic Impact	• Limited socio-economic data such as:
	  • Costs of programs and infrastructure
	  • Participation rates
		• International or large regional sources of data are applied assuming similar circumstances
		• Complete list of data sources and their applications found in appendix
		• Deviations can heavily impact our economic impact projections

Economic Impact	• Lack of data for estimating revenue and expenses including:
	  • Indication of specific economy activity
	  • Details on revenue sources (e.g., ticket prices, sponsors, sponsorship amounts, merchandise demand, broadcasting)
	  • Existing spending on football programs
		• Assume Rarita follows similar trends to countries in the provided data
		• Assumes patterns in historical data will continue in the future
		• A greater understanding of these factors would lead to more precise estimates of economic impact

Sensitivity Analysis

Key assumptions are made in the team performance projections and the rank-to-revenue projections. To assess sensitivity of assumptions, we have observed levels of revenue at the upper and lower ends of the confidence interval and its impacts on revenue.

Figure 13: Sensitivity Analysis – Rank to Revenue Projections

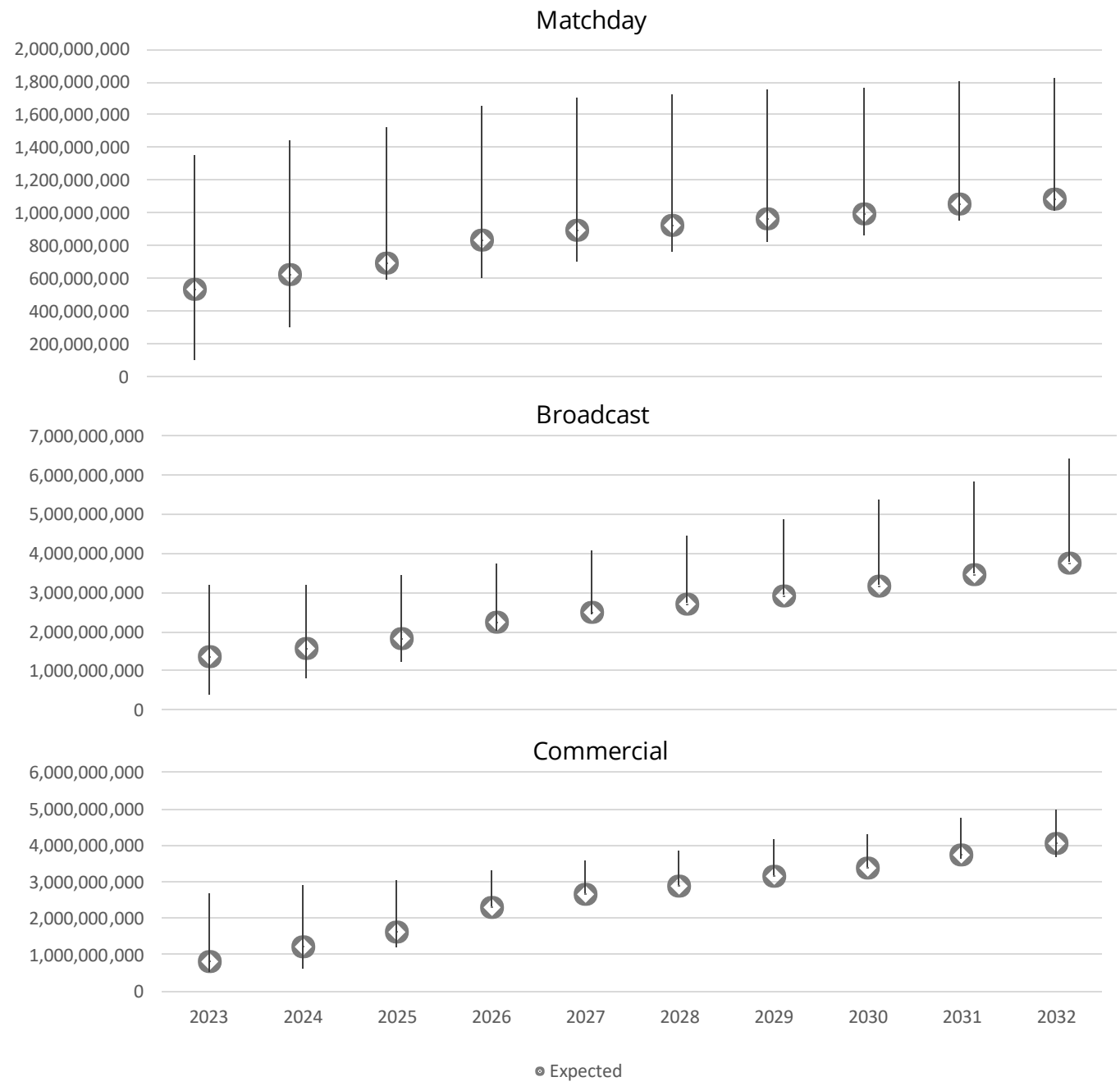
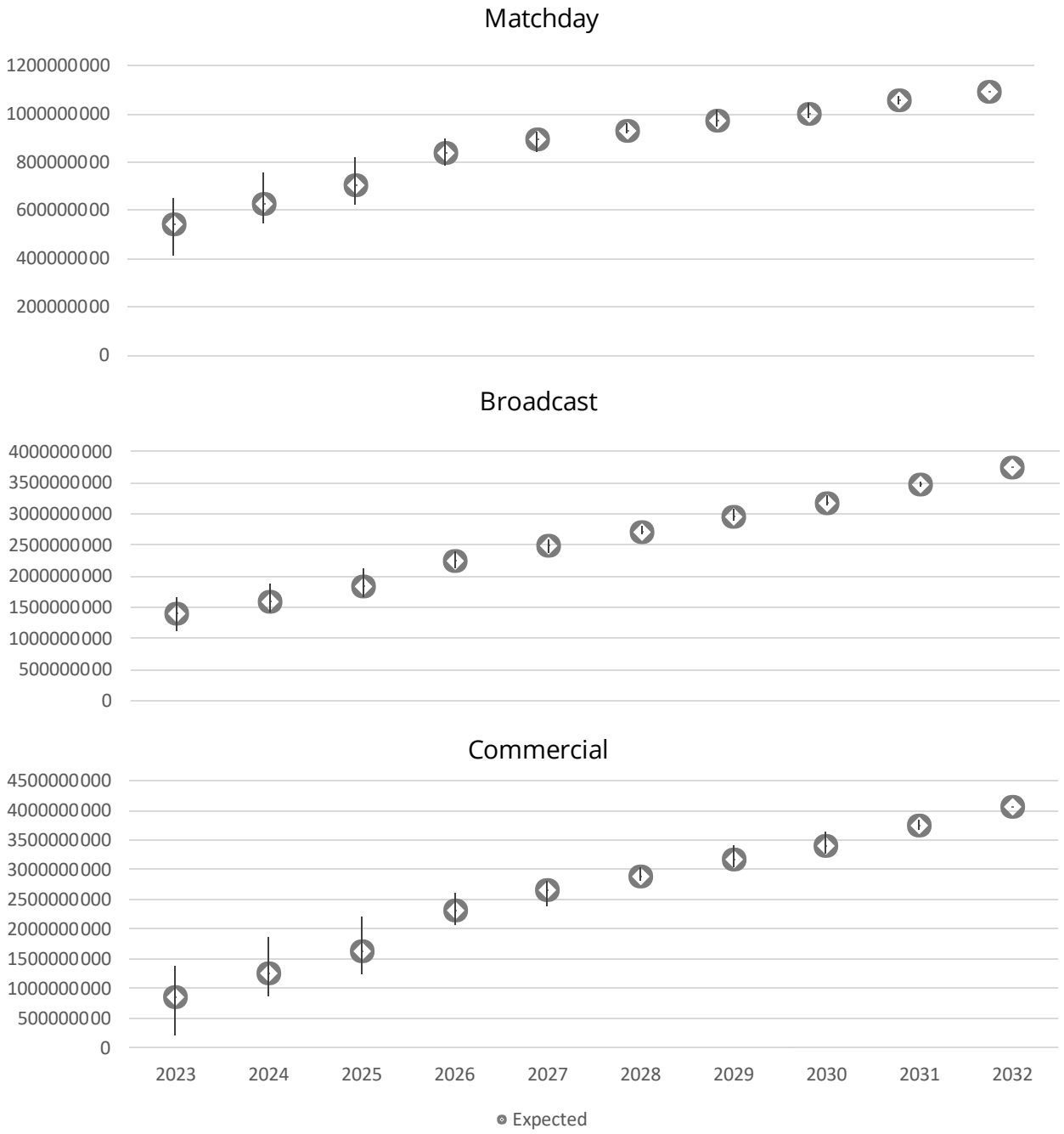


Figure 14: Sensitivity Analysis – Rank Projections



The rank to revenue projections have large range of values which reflects the reduced predictive power of the model due to data limitations. In contrast, the rank projections have a small range of values. As such, we have taken conservative values towards the lower range of the confidence interval so that the budget is prepared for the worst-case scenario and there is significant upside potential. In all cases, the revenue is able to support expenses to result in positive profits.

Conclusion

Through the selection of a high performing team, Rarita has strong chances of placing within the top 10 and achieving the FSA championship within 10 years. With such achievements, the resulting commercial success generates sufficient resources to allow implementation of key strategies which support the development of players to their maximum potential whilst engaging the broader community.

Through our two expenditure programs, investments are aimed at the grassroots level, allowing an equitable re-distribution of profits to improve the general quality of life and wellbeing. Ultimately, our strategies will guarantee sustainable and profitable growth, creating on average over ∂11,640 mil worth of annual socio-economic benefits.

APPENDIX

Model Scoring

In model building and selection, the normal practice is to use a training dataset and a testing dataset. The training dataset used was the EPL data, as due to its relative cleanliness of data and the availability of the past 5 years of data, 5-fold cross validation could be easily carried out to tune and select the appropriate parameters for each model.

Appropriately, the usage of the tournament dataset as the testing dataset is ideal as testing datasets should aim to mimic what is observed 'in the wild', where model error is inevitable and to ensure performance consistency, as a model could perform well on training datasets due to model overfitting.

The challenge faced was that the tournament dataset did not have SPI values to evaluate the models. It had, however, the tournament results which ranks each team in 2021. Hence, while the training error was based on the root mean-squared error and Adjusted R-squared values of the SPI predictions, for the test error the teams were first ranked based on their average SPI predictions and compared to the actual rank. The metric for the test error was separately defined to be:

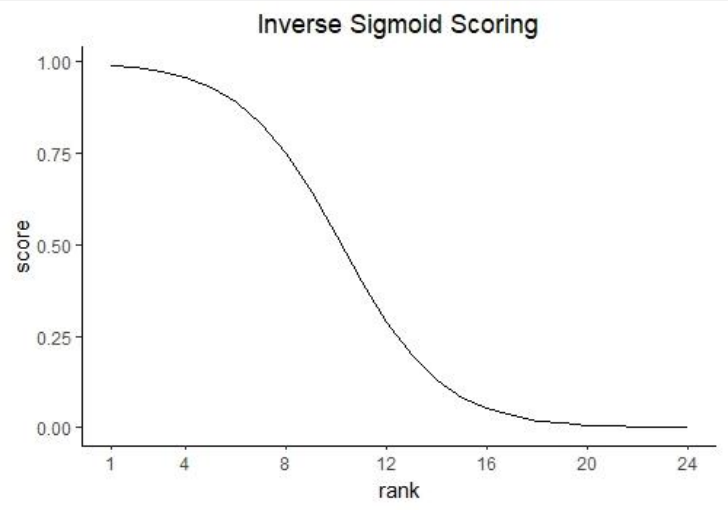
i. Mean Squared Error (MSE) of actual vs. predicted ranks

ii. Penalized Mean Squared Error

- Multiply the difference in rank predictions by 2 if actual rank is higher than the predicted.
- Penalizes the model more for not predicting good performance of teams over predicting bad performances.

iii. Inverse Sigmoid Score Error

- Each team's rank is converted to a score between 1 to 0. Ranks above 10 have scores above 0.5 and close to 1, while ranks below 15 is close to 0. This is inline with the objective of being in the Top 10 of FSA.
- The test error was the mean squared between the actual and predicted inverse sigmoid scores.



A1: Modelling Procedure

Three models were used in predicting player SPI, namely a simple linear regression model, a regularized linear regression (Elastic Net – A mix of LASSO & Ridge regression) and XGBoost, a modern decision tree model based on gradient descent and tree boosting.

Overall Model Performance

Model	MSE	MSE_Penalized	MSE_Score
el_net	45.5	115.0	0.176
linear	50.7	126.4	0.196
xgboost	32.7	76.9	0.137

Table above shows the performance of each model on predicting the results of the whole tournament, regardless of position. While SPI modelling was based around using position specific variables as inputs, it is reasoned that the overall tournament result should be due to the collaborative effort of the whole team and not one single player.

It is observed that XGBoost has the greatest performance in predicting tournament rank. Note that the MSE of 32.7 implies that on average the ranks were differing by 5.7. While this may be evidence that the model is ineffective, it should be noted that the tournament format with knockouts implicates that the testing data is more volatile than a regular league result.

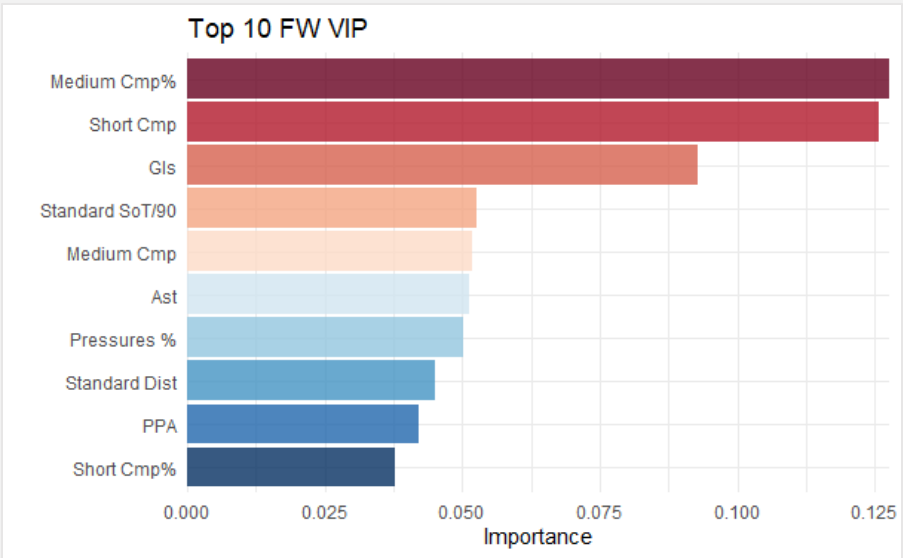
Position Specific Performance

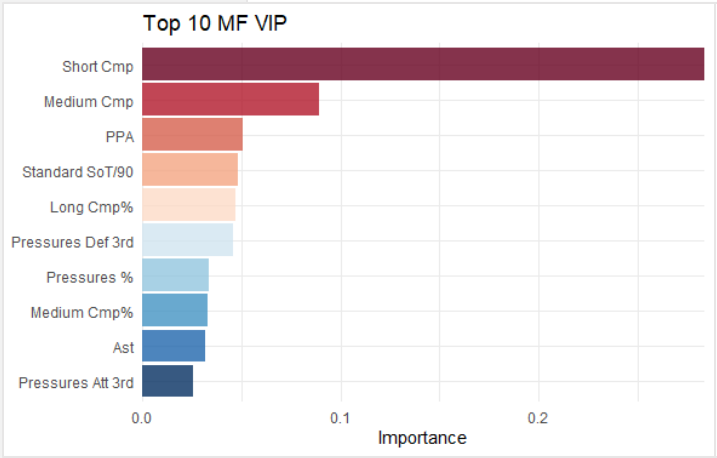
Position	Model	MSE	MSE_Penalized	MSE_Score
FW	xgboost	50.5	120.0	0.198
MF	xgboost	38.5	98.2	0.170
DF	xgboost	38.0	84.0	0.151
GK	lasso	32.3	79.3	0.155

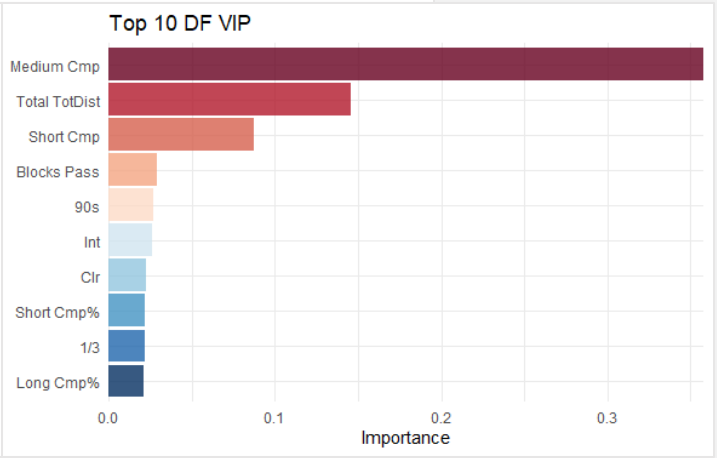
Table above shows the performance of each model in predicting the results based on the team's SPI in each position. While the ranking predictions of purely based on position specific models would be inaccurate, it serves as a good comparison of models. LASSO outperformed XGBoost in predicting goalkeeper performance as the goalkeeper dataset was only 188 rows long. LASSO worked well in identifying the most crucial variables in a low data environment, reducing the variance of the model.

Variable Importance

To evaluate which variables had the largest impact on the SPI of each position, the variable importance plot are shown for each position, below:







In general, the largest indicator of SPI were the player passing rates. For MF and DF, short and medium passes completed respectively were key indicators of SPI. Looking at the non-passing completed variables, MF prioritized passes completed to the 18-yard box while DF prioritized total distance passed and blocked passes.

However, for FW no one clear variable stood out. The variable importance declined more gradually, with goals, assists, pressures and shots on target being key variables along with the normal passing ones. Intuitively, this is because each team would have a primary striker that is supported by the other forwards.

A1: Modelling Procedure

As mentioned, due to the small number of rows in the goalkeeper dataset, only 8 columns were used. Regularization also serves as a variable selection process, and after running the model variables with non-zero coefficients were:

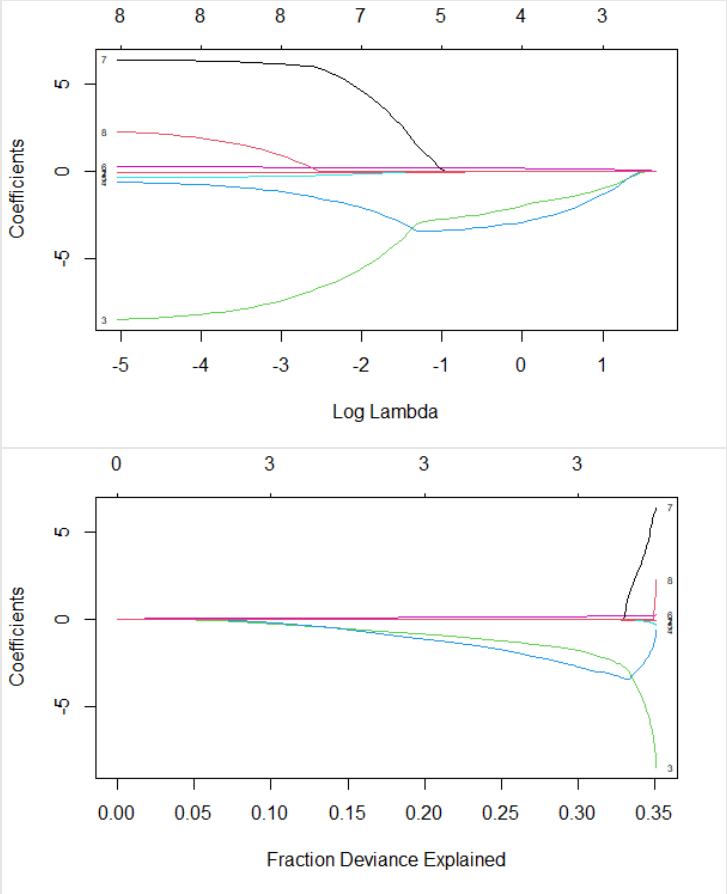
Term	Coefficient
(Intercept)	79.53
Performance GA90	-2.00
Performance Saves	-2.93
Performance CS%	0.15

The selection of the variables is done through a regularization parameter. As the parameter (called lambda) increases, the size of the coefficients for the variable decreases, often making less significant variables 'disappear' through having a zero coefficient.

Below shows the changes in coefficients as the lambda increases.

The fraction deviance explained plot is measured on the training data and is a measure of complexity of the model. The optimal point of regularization is when the deviance no longer increases significantly with the size of the coefficient of variables. Such is observed in the right of the graph, where deviance does not change much but the coefficients are "blowing up".

The key variables for goalkeepers are the goals against and shot saved values. A large reason why penalty kicks were not identified as important could be that dominant teams often do not end up in penalty kick scenarios.



A2: Key Metrics by Position

Position	Dataset	Variables
FW	Shooting	Gls, Standard SoT/90, Standard G/SoT, Standard Dist, Standard FK, Performance PK, Performance PKatt
	Passing	Total TotDist, Total PrgDist, Short Cmp, Short Cmp%, Medium Cmp, Medium Cmp%, Long Cmp, Long Cmp%, Ast, KP, 1/3, PPA, CrsPA, Prog
	Defense	Tackles TklW, Tackles Att 3rd, Vs Dribbles Tkl, Vs Dribbles Tkl%, Pressures %, Pressures Att 3rd, Int, Err
MF	Shooting	Gls, Standard SoT/90, Standard G/SoT, Standard FK, Performance PK, Performance PKatt
	Passing	Total TotDist, Total PrgDist, Short Cmp, Short Cmp%, Medium Cmp, Medium Cmp%, Long Cmp, Long Cmp%, Ast, KP, 1/3, PPA, CrsPA, Prog
	Defense	Tackles TklW, Tackles Def 3rd, Tackles Mid 3rd, Tackles Att 3rd, Vs Dribbles Tkl, Vs Dribbles Tkl%, Pressures %, Pressures Def 3rd, Pressures Mid 3rd, Pressures Att 3rd, Blocks ShSv, Blocks Pass, Int, Clr, Err
DF	Passing	Total TotDist, Total PrgDist, Short Cmp, Short Cmp%, Medium Cmp, Medium Cmp%, Long Cmp, Long Cmp%, Ast, KP, 1/3, Prog
	Defense	Tackles TklW, Tackles Def 3rd, Tackles Mid 3rd, Vs Dribbles Tkl, Vs Dribbles Tkl%, Pressures %, Pressures Def 3rd, Pressures Mid 3rd, Blocks ShSv, Blocks Pass, Int, Clr, Err
GK	Goalkeeping	Playing Time 90s, Performance GA90, Performance Saves, Performance Save%, Performance CS%, Penalty Kicks PKsv, Penalty Kicks PKA

A3: Impact of National Identity

The success of a player can have a huge socio-economic impact on their nation as evidenced by Son Heung-min, a footballer for Tottenham Hotspur from South Korea.

Recent surveys of South Koreans aged 16 to 69 show 21.4% support for Tottenham (roughly 11 million fans) compared to 6.1% for the second most popular club following Son's rise to fame as a forward in the EPL (Mulvenney, 2020).

Macro Nazzari, the Managing Director at Nielsen Sports International goes on to say, "The popularity of Tottenham Hotspur in South Korea perfectly illustrates the positive impact a standout player can have on a sports franchise in a market halfway around the world".

It is also noted that the second most popular club in South Korea is United, which is also driven by a South Korean player. Midfielder Park Ji-sung's arrival at Old Trafford in 2005 sparked major South Korean interest in the EPL team (Mulvenney, 2020).

Rarita National Team

Player	Position	Nation	League	Squad	Age	SPI	Salary	Loan Cost
T. Kamugisha	GK	Lefghau	RFL	Marvelous Coyotes	28	79.6	3,468,182ð	346,818ð
Y. Draru	GK	Rarita	RFL	Marvelous Coyotes	37	74.5	5,530,000ð	0ð
R. Amadu	DF	Esia	C	Serious Cyclones	25	96.5	17,863,636ð	1,786,364ð
M. As	DF	People's Land of Maneau	RFL	Marvelous Coyotes	27	93.6	2,813,636ð	281,364ð
S. Rostami	DF	Lefghau	RFL	Marvelous Coyotes	35	93.5	2,527,273ð	252,727ð
H. Sinaga	DF	Bernepamar	RFL	Marvelous Coyotes	25	93.5	1,545,455ð	154,545ð
O. Atim	DF	People's Land of Maneau	RFL	Marvelous Coyotes	31	93.5	2,077,273ð	207,727ð
J. Wulandari	DF	Nganion	RFL	Marvelous Coyotes	27	93.4	3,200,000ð	320,000ð
E. Naik	DF	Nganion	RFL	Marvelous Coyotes	20	93.3	2,340,909ð	234,091ð
R. Mensah	DF	Rarita	RFL	Strong Oaks	23	91.1	5,300,000ð	0ð
T. Chebet	DF	People's Land of Maneau	A	Old Mustangs	24	90.5	8,204,545ð	820,455ðð
W. Mbaziira	DF	Rarita	RFL	Strong Oaks	37	89.9	4,000,000ð	0ð
O. Aboagye	MF	Dosqaly	E	Festive Governors	30	96.3	25,627,273ð	2,562,727ð
F. Yunusa	MF	Rarita	B	Flawless Cows	26	94.9	17,280,000ð	0ð
J. Nakano	MF	Pierrema	RFL	Marvelous Coyotes	29	94.6	7,554,545ð	755,455ð
Z. Ahmetovi	MF	Lefghau	B	Flawless Cows	29	93.6	28,445,455ð	2,844,545ð
A. Kuhn	MF	Esia	RFL	Marvelous Coyotes	31	93.0	4,259,091ð	425,909ð
D. Baah	MF	Rarita	RFL	Strong Oaks	26	92.7	3,610,000ð	0ð
J. Singini	MF	People's Land of Maneau	RFL	Marvelous Coyotes	21	91.6	5,181,818ð	518,182ð
T. Nakirijja	MF	Nganion	RFL	Marvelous Coyotes	25	91.1	3,813,636ð	381,364ð
V. Mattila	MF	Iverde	A	Old Mustangs	26	90.0	24,390,909ð	2,439,091ð
V. Waswa	MF	Byasier Pujan	A	Old Mustangs	31	90.0	17,054,545ð	1,705,455ð
J. Halvorsen	FW	Esia	C	Ultimate Dolphins	18	94.9	5,054,545ð	505,455ð
F. Kazembe	FW	Lefghau	RFL	Marvelous Coyotes	24	92.9	5,818,182ð	581,818ð
P. Villa	FW	Rarita	RFL	Black Coyotes	22	92.4	7,820,000ð	0ð
L. Edwards	FW	People's Land of Maneau	A	Old Mustangs	28	90.3	21,140,909ð	2,114,091ð
Z. Zziwa	FW	Rarita	RFL	Strong Oaks	25	88.5	9,120,000ð	0ð
V. Tugume	FW	Sobianitedrucy	D	Marvelous Patriots	34	87.5	32,800,000ð	3,280,000ð

Goalkeeper

T. Kamugis is a player from the RFL with an impressive save percentage of 73.9%, only 0.8 goals against per 90 minutes and 49.2% of games with a clean sheet, all over the equivalent of 35 games played. SPI is relatively good at 79.6 for goalkeepers (just outside top 10) and the player is still quite young at 28 with the lowest salary among the top 45 players by SPI (3,468,182∂).

Y. Draru is from Rarita with a SPI of 74.5 and also a relatively low salary (5,530,000∂). The player is older at 37 so should add some needed experience to the team.

Defender

M. As, S. Rostami, H. Sinaga, O. Atim, J. Wulandari, E. Naik are defenders from the RFL in the Marvelous Coyotes squad. All these players have high SPIs above 93 and vary in age from 20 to 35. Their salaries are also quite low, averaging out at 2,417,424∂. It is also noted that J. Wulandari and E. Naik are tournament players for Nganion.

R. Mensah and W. Mbaziira are Rarita players part of Strong Oaks squad. They have good SPIs at 91.1 and 89.9 with highly competitive salaries of 5,300,000∂ and 4,000,000∂ for Mensah and Mbaziira respectively. Mensah is 23 years old with the equivalent of over 17 games played and strong passing ability (1.92 assist per 90 minutes and 35 passes that enter the forward 1/3 of the field). Mbaziira is older at 37 years old with his statistics displaying strong passing experience (passes travelling a total of 27,578 yards with a total progressive distance of 9,207 yards).

R. Amadu and T. Chebet are players that bring experience in higher leagues. Amadu is from the C league and has the 2nd highest SPI at 96.5. He has played the equivalent of 11 games with 0 errors. Chebet is from the A league in the Old Mustangs squad, and has a very competitive salary at 9,025,000∂ for an equivalent of over 14 games played and a 90.5 SPI amongst greater competition.

Midfielder

F. Yunusa and D. Baah are Rarita midfielders. Yunusa also participates in the B league and is the highest rated midfielder by SPI for the B league at 94.9. Baah has a strong passing ability with >85% of total passes completed with a highly competitive salary of 3,610,000∂.

J. Nakano, A. Kuhn, J. Singini and T. Nakirijja are midfielders from the RFL in the Marvelous Coyotes squad. Their SPIs exceed 91 and put them in the top 20 midfielders by SPI. They also each have very competitive salaries averaging at 5,722,500∂, all with significant minutes played (lowest is equivalent of 14 games played). Of note, Nakirijja is a tournament player for Nganion.

V. Mattila and V. Waswa are midfielders in the A league under the Old Mustangs squad. Both have an SPI of 90.0 and are the highest rated midfielders by SPI.

Z. Ahmetovi is a midfielder from the B league. They have the equivalent of 15 games played with 0 errors and 0.72 goals per 90 minutes. Their SPI is 93.6.

O. Aboagye is a midfielder from Dosqaly. They have the highest SPI of all midfielders with the equivalent of 28 games played and is a tournament player for Dosqaly.

Forward

P. Villa and Z. Zziwa are Rarita forwards in the RFL with SPIs of 92.4 and 88.5 respectively. Both are relatively young players (22 and 25 respectively) with competitive salaries (7,820,000∂ and 9,120,000∂ respectively). Villa has a strong impact on their team's ability to set up goals (3.0 assist per 90 minutes, 19.1 passes per 90 minutes that directly lead to a shot, 30.1 passes per 90 minutes that reach the forward 1/3 of the field). Zziwa is part of the Strong Oaks squad and has a standout performance in penalty kicks (0.14 penalty kicks made per 90 minutes, highest of the top 30 forwards).

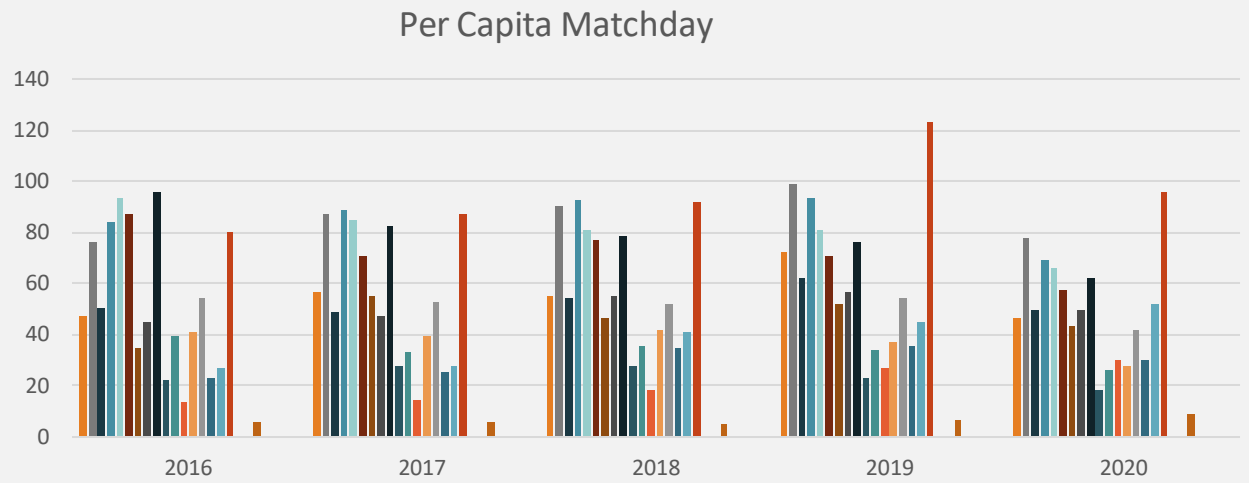
F. Kazembe is a forward from the RFL in the Marvelous Coyotes squad. They have the second highest SPI among forwards at 92.9 and an impressive shooting ability, with 1.29 shots on target per 90 minutes and 0.52 goals per shots on target per 90 minutes. Their salary is also very low at 6,400,000∂.

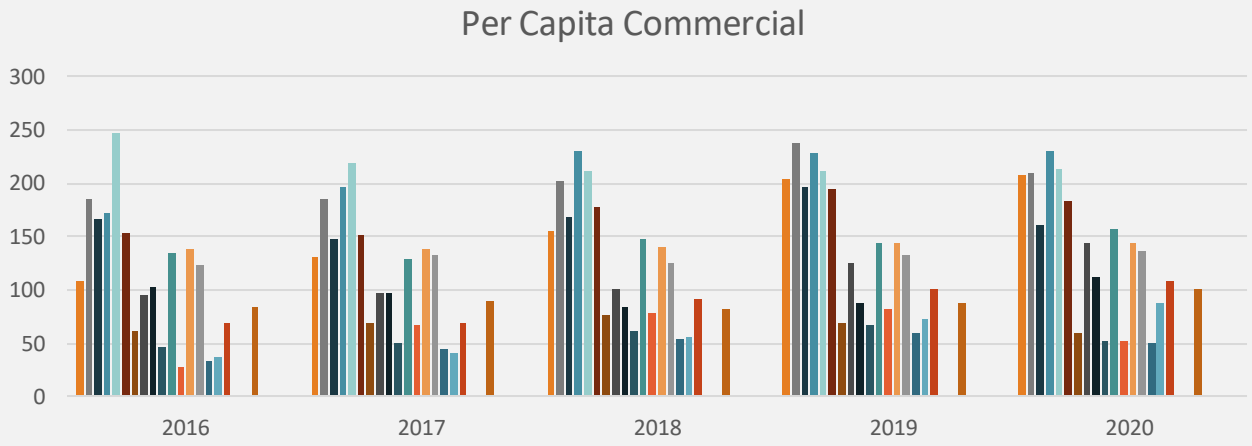
L. Edwards is the highest rated forward in the A league with an SPI of 90.3 and is part of the Old Mustangs squad.

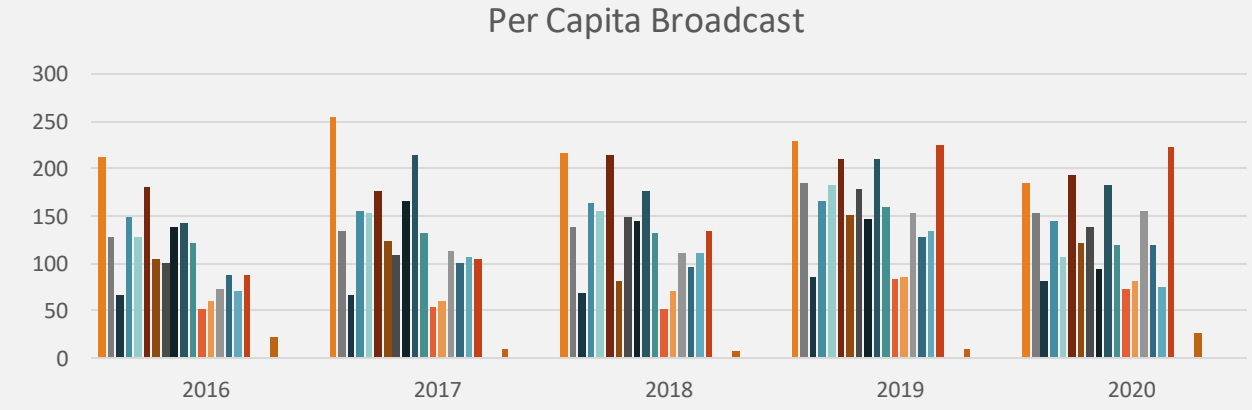
J. Halvorsen is the highest rated forward amongst all players with an SPI of 94.9. They have a very competitive salary at 5,560,000∂ and 0 errors at almost the equivalent of 10 games played. They also have a very high ability to score goals with 0.62 goals per 90 minutes, 1.13 shots on target per 90 minutes and 0.51 goals per shots on target per 90 minutes.

V. Tugume is a forward from Sobianitedrucy. They have an SPI of 87.5 and an impressive 0.57 goals per shots on target per 90 minutes. They are significantly older at 34 but combined with their tournament involvement will bring experience to the team.

Amounts

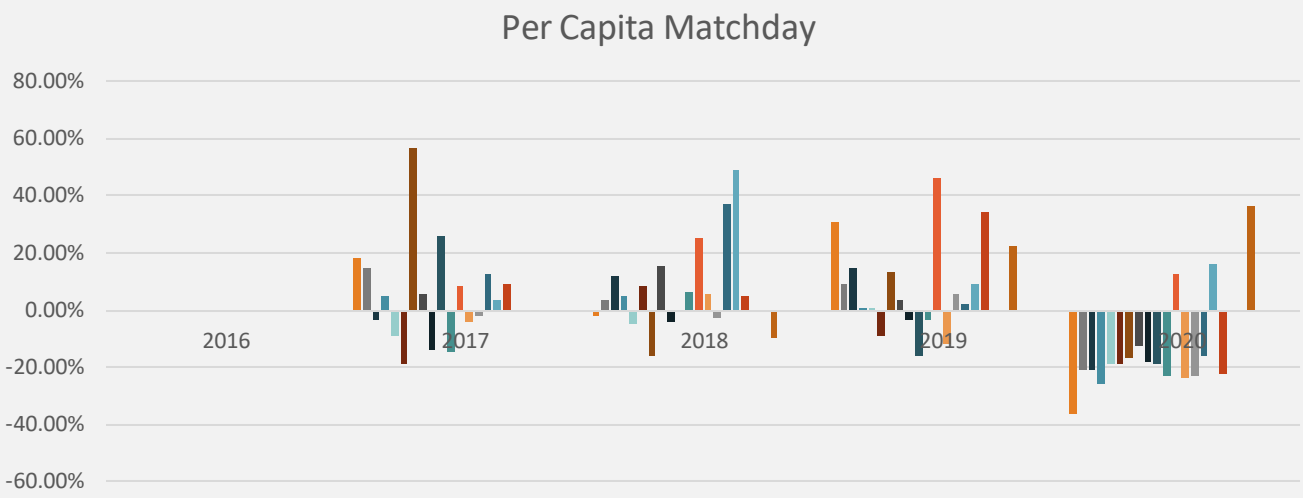

Per Capita Matchday
140
120
100
80
60
40
20
0
2016
2017
2018
2019
2020

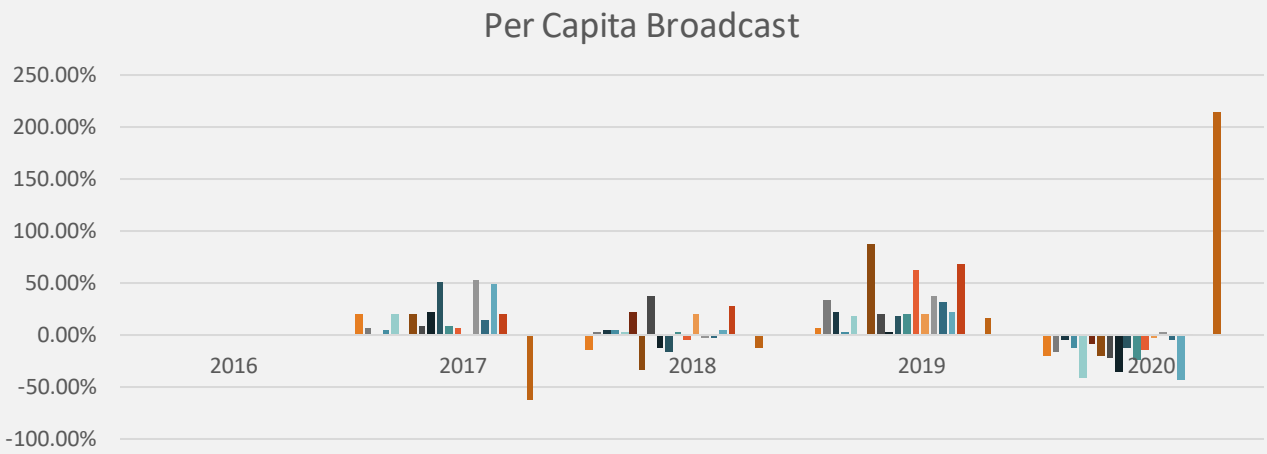

Per Capita Commercial
300
250
200
150
100
50
0
2016
2017
2018
2019
2020

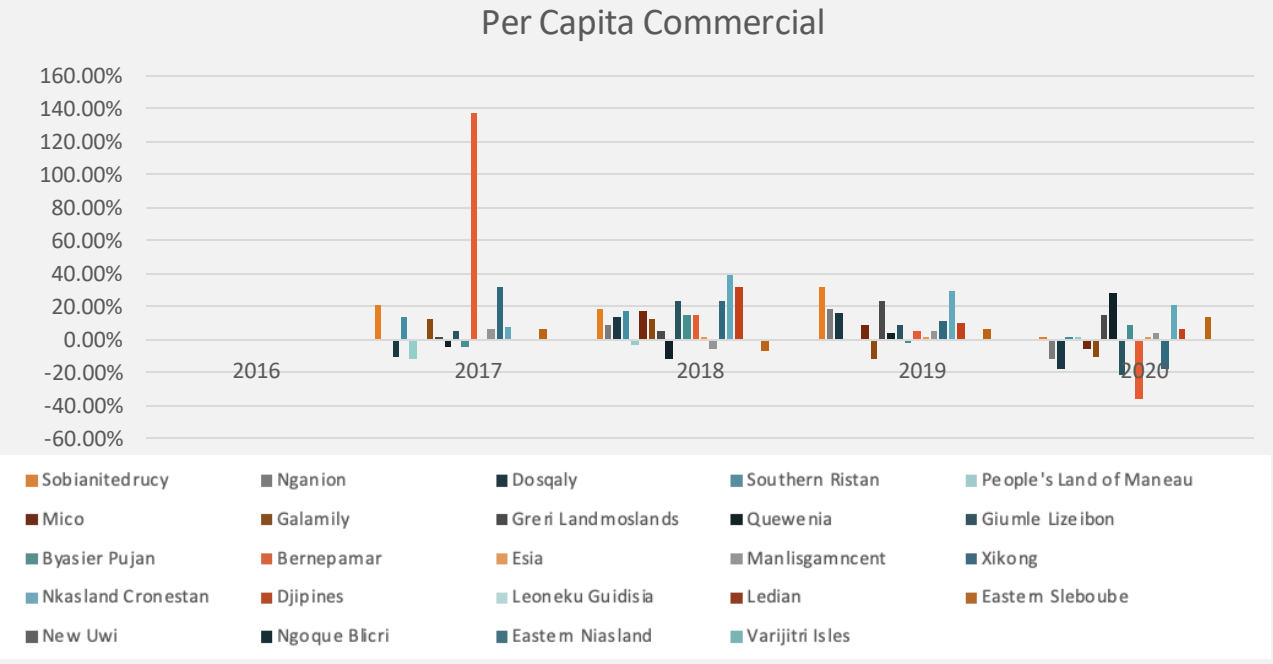

Per Capita Broadcast
300
250
200
150
100
50
0
2016
2017
2018
2019
2020


Sobianitedrucy
Nganion
Dosqaly
Southern Ristan
People's Land of Maneau
Mico
Galamily
Greri Landmoslands
Quewenia
Giumle Lizeibon
Byasier Pujan
Bernepamar
Esia
Manlisgamncent
Xikong
Nkasland Cronestan
Djipines
Leoneku Guidisia
Ledian
Eastern Sleboube
New Uwi
Ngoque Blicri
Eastern Niasland
Varijitri Isles

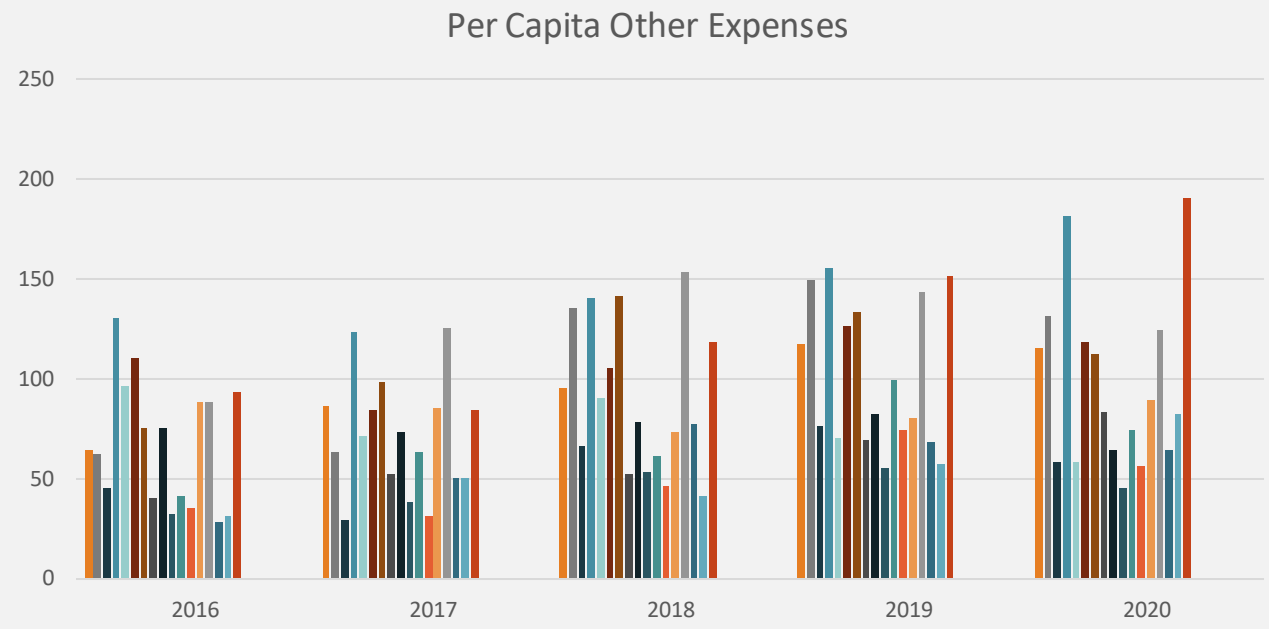
Change Analysis

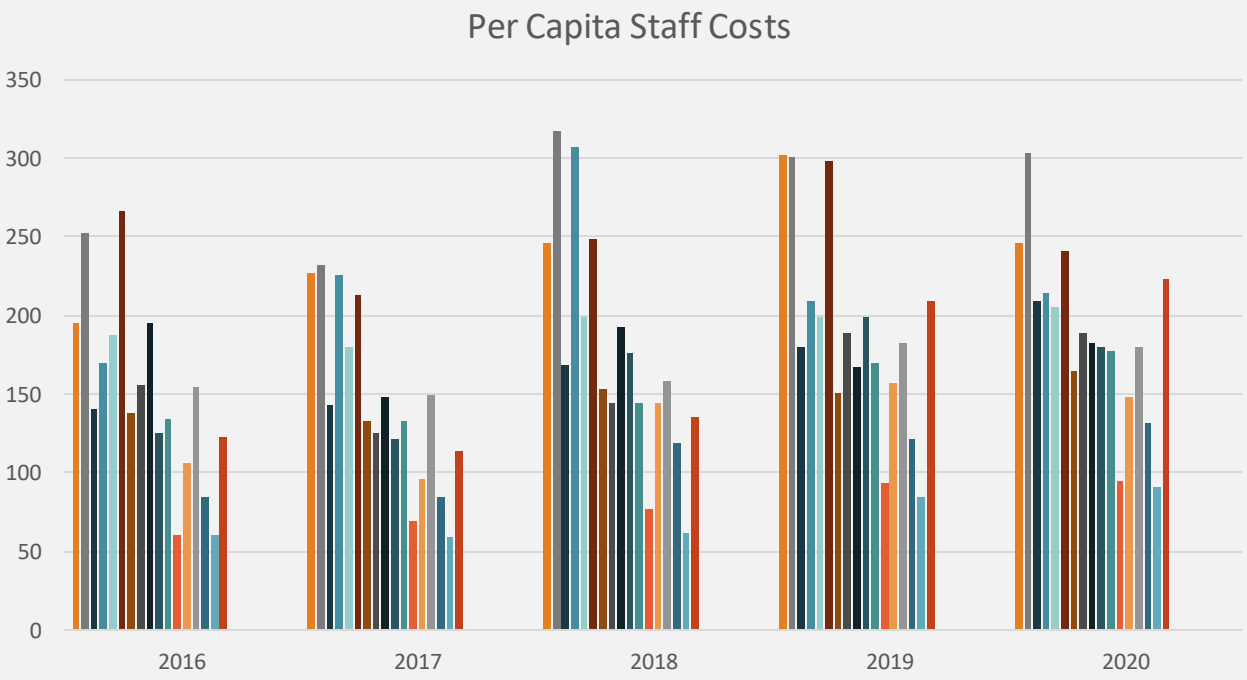






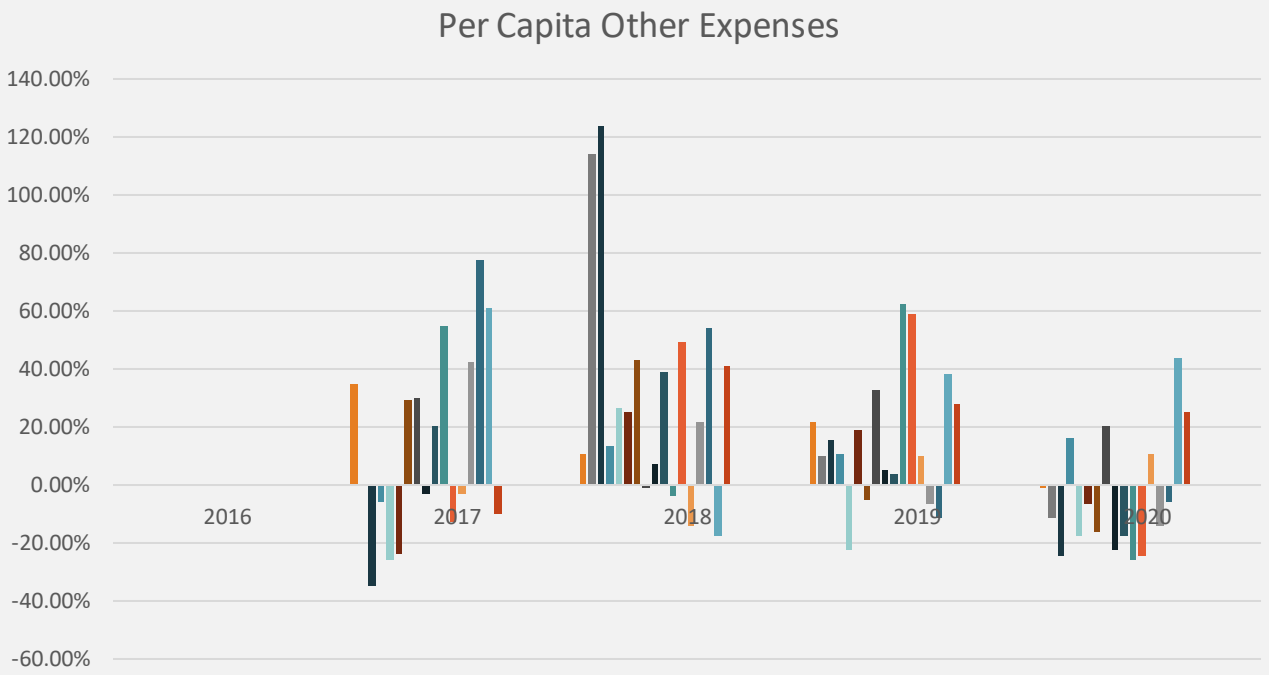
Amounts

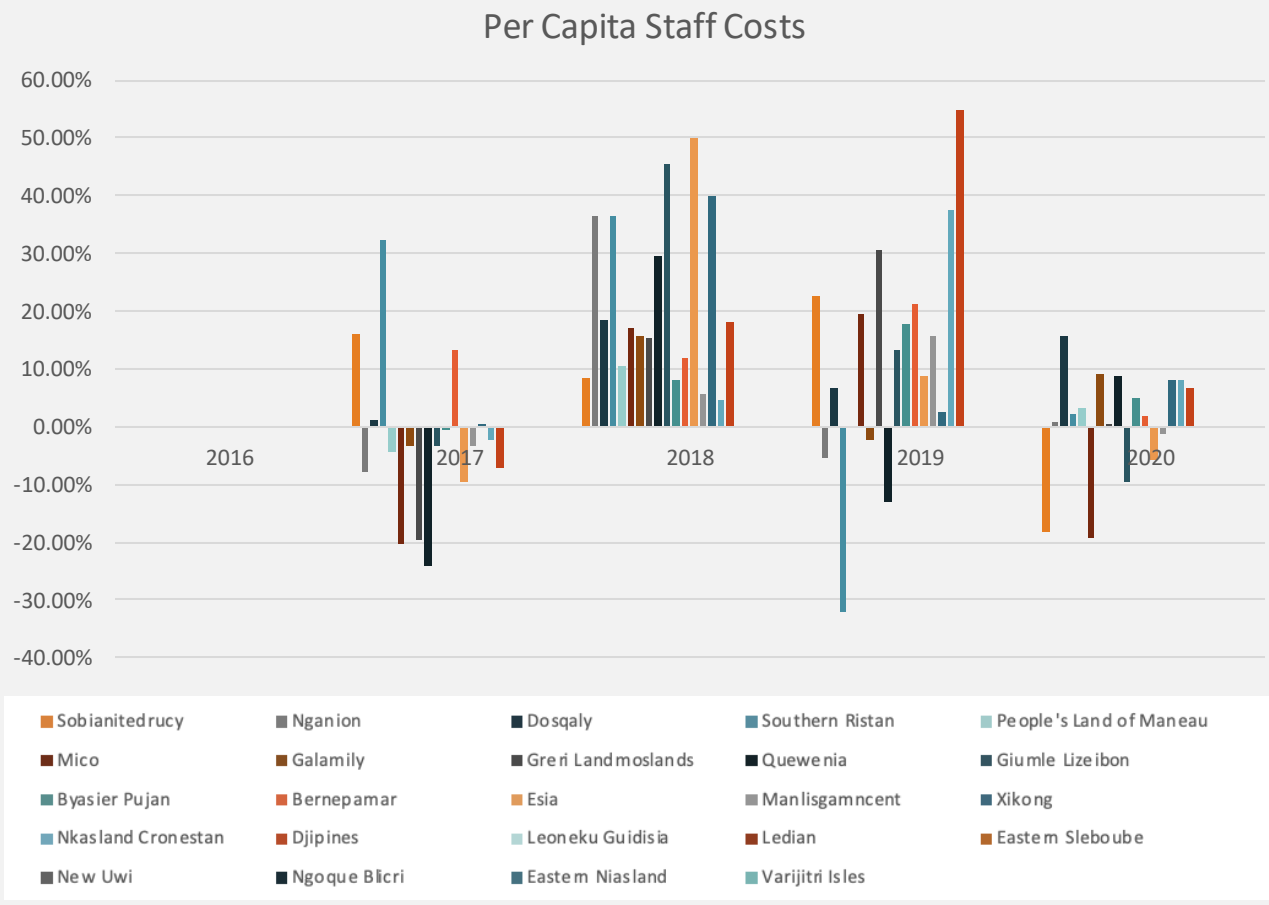




Sobianitedrucy, Nganion, Dosqaly, Southern Ristan, People's Land of Maneau, Mico, Galamily, Greri Landmoslands, Quewenia, Giumle Lizeibon, Byasier Pujan, Bernepamar, Esia, Manlisgamncent, Xikong, Nkasland Cronestan, Djipines, Leoneku Guidisia, Ledian, Eastem Sleboube, New Uwi, Ngoque Blicri, Eastem Niasland, Varijitri Isles

Change Analysis





A6: Revenue-Rank Analysis

```
> summary(regressionAv_7)

Call:
lm(formula = tournament_rank.x ~ matchday_av + broadcast_av +
    commercial_av + staff_cost_av + other_exp_av, data = collatedAv

Residuals:
      Min        1Q    Median        3Q       Max
-2.51797 -0.79571  0.02435  1.18787  1.94272

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  16.807190   1.801460   9.330 1.42e-05 ***
matchday_av   0.001151   0.042885   0.027   0.9792
broadcast_av  0.004205   0.020402   0.206   0.8419
commercial_av -0.019594   0.018005  -1.088   0.3082
staff_cost_av -0.066422   0.023980  -2.770   0.0243 *
other_exp_av  0.059471   0.024643   2.413   0.0423 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.884 on 8 degrees of freedom
Multiple R-squared:  0.877,     Adjusted R-squared:  0.8001
F-statistic: 11.41 on 5 and 8 DF,  p-value: 0.001768
```

```
> summary(regressionAv_8)

Call:
lm(formula = tournament_rank.x ~ staff_cost_av + other_exp_av,
    data = collatedAv)

Residuals:
    Min      1Q  Median      3Q     Max
-2.6138 -1.4012  0.4096  1.3328  2.0805

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)   16.82817    1.53764  10.944 2.98e-07 ***
staff_cost_av -0.07649    0.01079  -7.090 2.02e-05 ***
other_exp_av   0.05479    0.02265   2.419   0.0341 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.774 on 11 degrees of freedom
Multiple R-squared:  0.8501,    Adjusted R-squared:  0.8228
F-statistic: 31.18 on 2 and 11 DF,  p-value: 2.935e-05
```

Match Day

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.367018
R Square	0.134702
Adjusted R Sq	0.077015
Standard Error	22.83298
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	1217.376	1217.376	2.335068	0.1473
Residual	15	7820.172	521.3448		
Total	16	9037.547			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	73.19085	12.88315	5.681131	4.36E-05	45.73107	100.6506	45.73107	100.6506
X Variable 1	-2.041733	1.336132	-1.528093	0.1473	-4.88963	0.806164	-4.88963	0.806164

Broadcast

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.4237
R Square	0.179522
Adjusted R Sq	0.124823
Standard Error	40.44193
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	5367.908	5367.908	3.28202	0.09011
Residual	15	24533.25	1635.55		
Total	16	29901.15			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	170.2944	22.81872	7.462922	2E-06	121.6574	218.9313	121.6574	218.9313
X Variable 1	-4.287353	2.366566	-1.811635	0.09011	-9.331568	0.756863	-9.331568	0.756863

Commercial

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.700497
R Square	0.490697
Adjusted R Sq	0.456743
Standard Error	42.70724
Observations	17

ANOVA

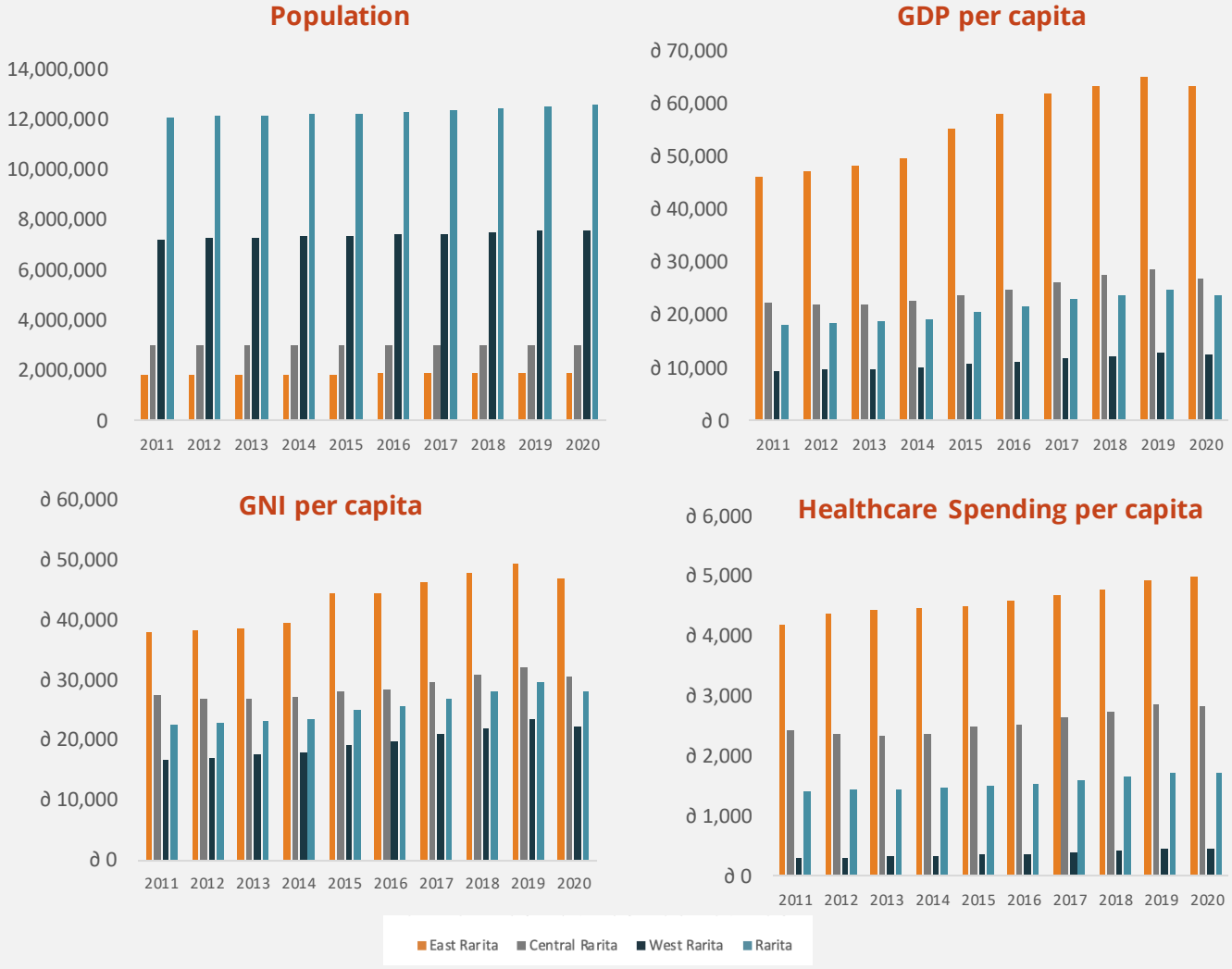
	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	26359.11	26359.11	14.452	0.001738
Residual	15	27358.62	1823.908		
Total	16	53717.73			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	208.862	24.09689	8.667593	3.17E-07	157.5007	260.2233	157.5007	260.2233
X Variable 1	-9.500623	2.499126	-3.801578	0.001738	-14.82738	-4.173862	-14.82738	-4.173862

Rank regressed against revenue sources as this was the only data source provided. From exploratory analysis, it can be observed there is a strong relationship between rank and revenue. This is because as a country increases in ranking, greater publicity led to increase in tickets sold, greater commercial activity and increased broadcasting demand.

After the first year of performance, the modelling should be revised to reflect the Rarita experience rather than the broad general nation experience. This involves collecting data relating to attendance, sponsors signed etc specific to Rarita.

A7: Analysis of Rarita Regions



Findings

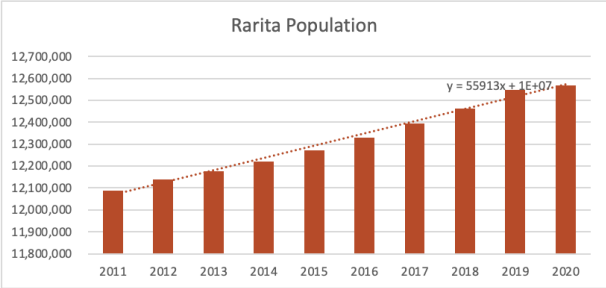
It can be observed that West Rarita has significantly lower GDP and GNI per capita compared to the other regions. This suggests slight economic disparity, which is further categorised by the low savings rate common with low-income households (Sherraden, 1999).

Bringing economic activity associated with football and its flow-on effects would be of much benefit. However, it is also important to diversify operational risk and maintain a cohesive national identity by investing in the other regions. The higher propensity to spend in other regions may allow greater expenditure on football so further investigation should be performed to identify which areas are of greater demand for infrastructure and football program support.

Strong linear relationship found – linear regression performed to project future levels. High R squared suggests high predictive power

POPULATION

Year	East Rarita	Central Rarita	West Rarita	Rarita	
2011	1,830,487	3,030,693	7,226,446	12,087,626	12068512.9
2012	1,839,177	3,031,099	7,267,257	12,137,533	12124425.6
2013	1,848,062	3,019,905	7,307,914	12,175,881	12180338.3
2014	1,859,198	3,010,270	7,352,123	12,221,591	12236251
2015	1,872,389	3,006,228	7,394,062	12,272,679	12292163.7
2016	1,888,325	3,007,362	7,435,584	12,331,271	12348076.5
2017	1,904,969	3,011,351	7,476,687	12,393,007	12403989.2
2018	1,920,728	3,021,994	7,520,631	12,463,353	12459901.9
2019	1,936,433	3,043,234	7,569,121	12,548,788	12515814.6
2020	1,943,215	3,020,190	7,606,067	12,569,472	12571727.3



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99488503
R Square	0.98979623
Adjusted R S	0.98852076
Standard Err	18230.5636
Observations	10

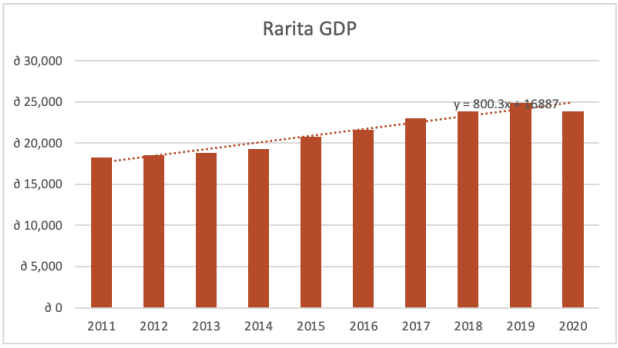
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.5791E+11	2.5791E+11	776.02376	2.9763E-09
Residual	8	2658827584	332353448		
Total	9	2.6057E+11			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-100371970	4045352.43	-24.811675	7.4436E-09	-109700569	-91043370	-109700569	-91043370
X Variable 1	55912.7212	2007.11899	27.857203	2.9763E-09	51284.2965	60541.1459	51284.2965	60541.1459

GROSS DOMESTIC PRODUCT (GDP) PER CAPITA

Year	East Rarita	Central Rarita	West Rarita	Rarita
2011	ð 46,119	ð 22,581	ð 9,445	ð 18,292
2012	ð 47,214	ð 22,190	ð 9,733	ð 18,523
2013	ð 48,159	ð 22,123	ð 9,977	ð 18,785
2014	ð 49,897	ð 22,646	ð 10,127	ð 19,260
2015	ð 55,404	ð 23,866	ð 10,741	ð 20,770
2016	ð 58,175	ð 24,817	ð 11,086	ð 21,646
2017	ð 62,042	ð 26,405	ð 11,759	ð 23,047
2018	ð 63,406	ð 27,687	ð 12,155	ð 23,820
2019	ð 65,046	ð 28,839	ð 13,013	ð 24,880
2020	ð 63,534	ð 27,080	ð 12,451	ð 23,863



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.96763624
R Square	0.93631989
Adjusted R S	0.92835988
Standard Err	670.233618
Observations	10

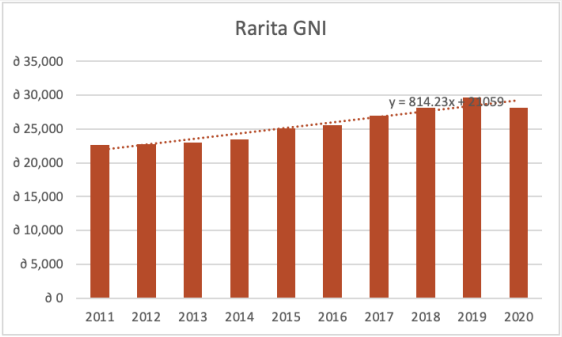
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	52840007.6	52840007.6	117.62793	4.6158E-06
Residual	8	3593704.82	449213.103		
Total	9	56433712.4			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1591722.2	148724.486	-10.702489	5.1019E-06	-1934681.4	-1248762.9	-1934681.4	-1248762.9
X Variable 1	800.30303	73.7902928	10.8456411	4.6158E-06	630.14231	970.463751	630.14231	970.463751

GROSS NATIONAL INCOME (GNI) PER CAPITA

Year	East Rarita	Central Rarita	West Rarita	Rarita
2011	ð 37,890	ð 27,534	ð 16,652	ð 22,596
2012	ð 38,347	ð 26,957	ð 17,096	ð 22,778
2013	ð 38,662	ð 26,806	ð 17,509	ð 23,026
2014	ð 39,588	ð 27,230	ð 17,819	ð 23,449
2015	ð 44,427	ð 27,950	ð 19,082	ð 25,121
2016	ð 44,416	ð 28,439	ð 19,615	ð 25,565
2017	ð 46,270	ð 29,667	ð 20,870	ð 26,912
2018	ð 47,989	ð 30,964	ð 21,976	ð 28,164
2019	ð 49,322	ð 32,042	ð 23,614	ð 29,625
2020	ð 46,830	ð 30,615	ð 22,383	ð 28,140



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.95974629
R Square	0.92111294
Adjusted R S	0.91125206
Standard Err	765.201283
Observations	10

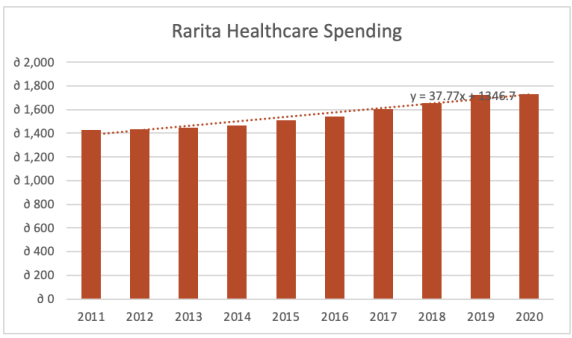
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	54695106.4	54695106.4	93.4108002	1.0941E-05
Residual	8	4684264.02	585533.003		
Total	9	59379370.4			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1615543.6	169797.761	-9.5145164	1.2292E-05	-2007097.9	-1223989.2	-2007097.9	-1223989.2
X Variable 1	814.230303	84.2458885	9.66492629	1.0941E-05	619.958936	1008.50167	619.958936	1008.50167

HEALTHCARE SPENDING PER CAPITA

Year	East Rarita	Central Rarita	West Rarita	Rarita
2011	ð 4,203	ð 2,447	ð 296	ð 1,427
2012	ð 4,367	ð 2,367	ð 308	ð 1,437
2013	ð 4,434	ð 2,334	ð 329	ð 1,449
2014	ð 4,458	ð 2,375	ð 335	ð 1,465
2015	ð 4,510	ð 2,487	ð 352	ð 1,509
2016	ð 4,604	ð 2,534	ð 362	ð 1,541
2017	ð 4,699	ð 2,639	ð 398	ð 1,604
2018	ð 4,787	ð 2,747	ð 420	ð 1,657
2019	ð 4,932	ð 2,870	ð 445	ð 1,725
2020	ð 4,979	ð 2,839	ð 460	ð 1,730



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.97311834
R Square	0.94695931
Adjusted R S	0.94032922
Standard Err	28.705453
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	117690.376	117690.376	142.827601	2.2117E-06
Residual	8	6592.02424	824.00303		
Total	9	124282.4			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-74570.424	6369.72486	-11.707009	2.5877E-06	-89259.036	-59881.812	-89259.036	-59881.812
X Variable 1	37.769697	3.16036636	11.9510502	2.2117E-06	30.4818791	45.0575149	30.4818791	45.0575149

A9: Financials – Revenue

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Notes	Source
1 Revenue												
Matchday	$ 543,633,084	$ 631,054,631	$ 707,143,269	$ 841,682,764	$ 899,520,139	$ 936,288,769	$ 977,163,933	$ 1,007,265,288	$ 1,059,789,557	$ 1,098,328,422		
Base	$ 534,450,326	$ 620,395,195	$ 683,455,662	$ 799,747,396	$ 840,265,939	$ 859,839,019	$ 882,218,644	$ 894,034,210	$ 924,764,975	$ 942,205,046	Comparable: Country Rank to Financials Analysis	Data
Growth %	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	Comparable: Average growth of countries (2016-2020)	Data
Broadcast	$ 1,456,266,779	$ 1,654,323,868	$ 1,965,186,518	$ 2,464,672,358	$ 2,813,210,159	$ 3,136,734,426	$ 3,505,936,329	$ 3,875,464,910	$ 4,363,503,426	$ 4,846,959,647		
Base	$ 1,333,794,874	$ 1,515,195,379	$ 1,648,541,860	$ 1,893,666,514	$ 1,979,678,123	$ 2,021,707,205	$ 2,069,629,637	$ 2,095,369,031	$ 2,160,827,682	$ 2,198,377,748	Comparable: Country Rank to Financials Analysis	Data
Growth %	9.2%	9.2%	9.2%	9.2%	9.2%	9.2%	9.2%	9.2%	9.2%	9.2%	Comparable: Average growth of countries (2016-2020)	Data
Commercial	$ 1,235,493,169	$ 1,333,442,409	$ 1,439,157,013	$ 1,553,252,614	$ 2,452,923,008	$ 2,647,389,437	$ 2,857,273,061	$ 3,083,796,147	$ 3,328,277,862	$ 3,592,141,957		
Base	$ 808,987,619	$ 1,201,543,240	$ 1,487,612,829	$ 2,021,378,928	$ 2,202,556,102	$ 2,286,269,538	$ 2,383,042,431	$ 2,430,658,490	$ 2,566,291,029	$ 2,640,079,122	Comparable: Country Rank to Financials Analysis	Data
Growth %	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	Comparable: Average growth of countries (2016-2020)	Data
Player Loans to other countries	$ 330,972,500	$ 348,107,772	$ 366,130,179	$ 385,085,652	$ 405,022,496	$ 425,991,521	$ 448,046,164	$ 471,242,632	$ 495,640,038	$ 521,300,559		
Investment income	$ -	$ 23,289,916	$ 9,359,875	$ 5,626,071	$ 9,075,726	$ 38,804,612	$ 8,816,830	$ 57,530,851	$ 55,353,463	$ 38,881,935		
- Amount to be invested	$ -	$ 707,962,417.95	$ 639,740,559.08	$ 768,394,700.79	##########	$ 1,670,279,983.69	$ 1,797,411,826.98	$ 1,869,017,622.79	$ 2,069,432,665.45	$ 2,584,877,351.95	(Current year profit - next year's expenses) *50%	
- Rate of return on investment	1.26%	3.29%	1.46%	0.73%	0.89%	2.32%	0.49%	3.08%	2.67%	1.50%	Monte Carlo simulation (normal dist) using historical data	Data
Total	$ 3,566,365,533	$ 3,990,218,596	$ 4,486,976,853	$ 5,250,319,458	$ 6,579,751,529	$ 7,185,208,764	$ 7,797,236,318	$ 8,495,299,827	$ 9,302,564,346	$ 10,097,612,521		

Matchday	Portion of total revenue attributed to match day - generated as a result of staging matches at stadiums and largely derived from ticket sales
Broadcast	Portion of total revenue attributed to broadcasting - media broadcasting revenue received due to participation in domestic leagues, domestic cups and, where relevant for some clubs, international competitions
Commercial	Portion of total revenue attributed to commercial - generated from sponsorship, merchandising and other commercial operations

A9: Financials – Expenses

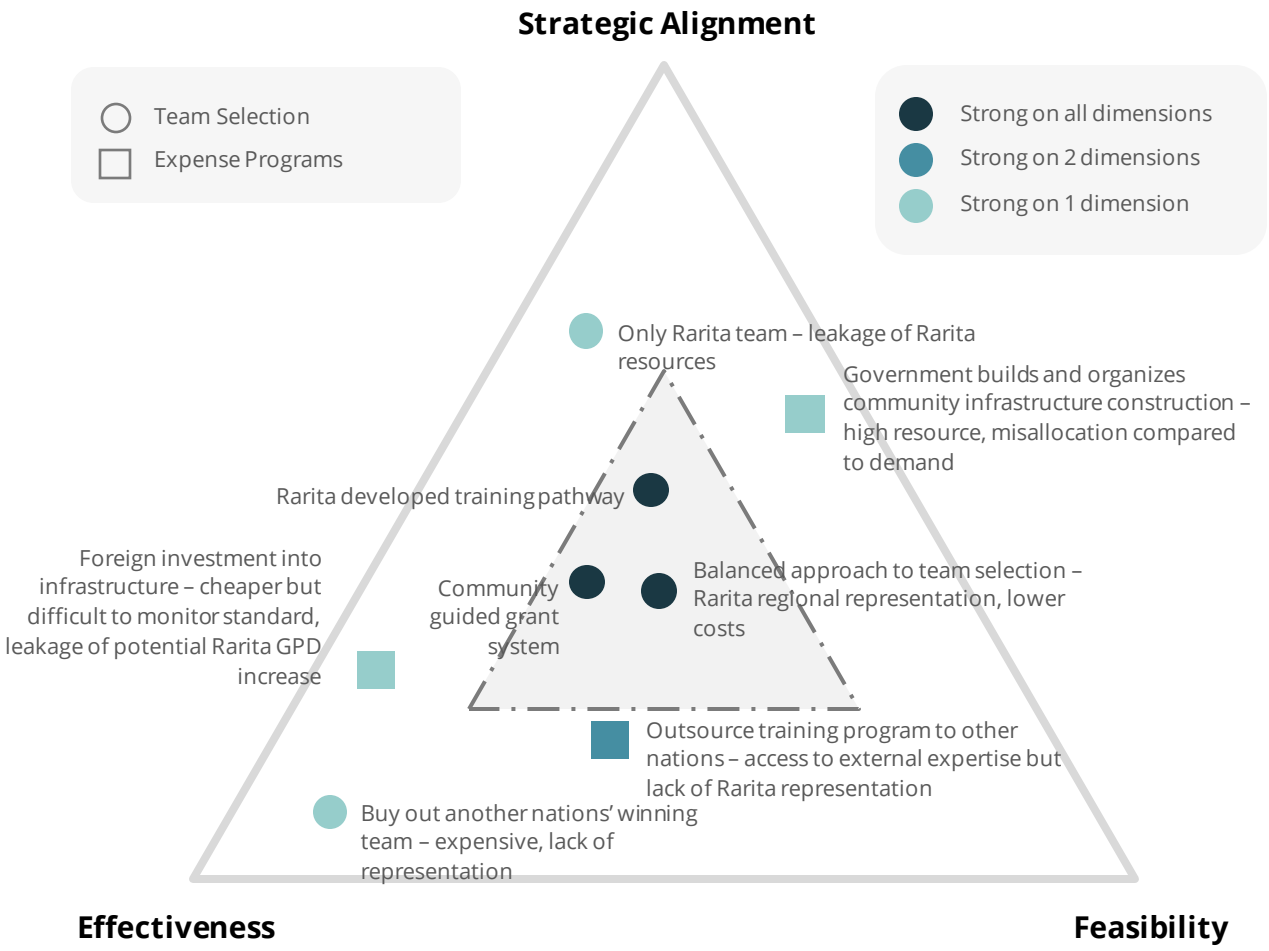
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Notes	Source
2 Expense												
Staff Costs	$ 1,063,005,000	$ 1,118,039,420	$ 1,175,923,109	$ 1,236,803,581	$ 1,300,835,987	$ 1,368,183,510	$ 1,439,017,782	$ 1,513,519,322	$ 1,591,877,992	$ 1,674,293,485		
Football Player Salaries	$ 323,955,455	$ 340,727,436	$ 358,367,745	$ 376,921,337	$ 396,435,495	$ 416,959,949	$ 438,547,006	$ 461,251,678	$ 485,131,828	$ 510,248,312	from player selection	Team Analysis
Player loans	$ 30,379,545	$ 31,952,370	$ 33,606,624	$ 35,346,523	$ 37,176,501	$ 39,101,221	$ 41,125,588	$ 43,254,763	$ 45,494,170	$ 47,849,516	from player selection	Team Analysis
Total Football Players Salaries + loans	$ 354,335,000	$ 372,679,807	$ 391,974,370	$ 412,267,860	$ 433,611,996	$ 456,061,170	$ 479,672,594	$ 504,506,441	$ 530,625,997	$ 558,097,828		
Support Staff Salaries	$ 708,670,000	$ 745,359,613	$ 783,948,739	$ 824,535,721	$ 867,223,991	$ 912,122,340	$ 959,345,188	$ 1,009,012,881	$ 1,061,251,994	$ 1,116,195,657	Comparable: Average ratio of support staff to football player salary is 2.5:1	Data
Salary Growth %	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	Comparable: Average growth of countries	Data
Facility Management	$ 1,100,000	$ 293,600,000	$ 293,600,000	$ 398,600,000	$ 503,600,000	$ 691,100,000	$ 773,600,000	$ 1,066,100,000	$ 1,066,100,000	$ 1,066,100,000		
- Number of stadiums being built	0	1	1	2	3	3	2	3	3	3	Comparable: 1990-2020 FIFA experience	FIFA, 2020
- Cost of stadium construction	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	$ 70,000,000	Comparable: 1990-2020 FIFA experience	FIFA, 2020
- Total Cost of stadium construction	$ -	$ 70,000,000	$ 70,000,000	$ 140,000,000	$ 210,000,000	$ 210,000,000	$ 140,000,000	$ 210,000,000	$ 210,000,000	$ 210,000,000		
- Number of community facility construction grants	0	50	50	50	50	100	150	200	200	200		
- Number of community facility construction grants	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	Comparable: UK investment in Football	Sport England, 2021
- Total Cost of community facility grants	$ -	$ 125,000,000	$ 125,000,000	$ 125,000,000	$ 125,000,000	$ 250,000,000	$ 375,000,000	$ 500,000,000	$ 500,000,000	$ 500,000,000		
- Facility Maintenance	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	$ 1,100,000	Comparable: average of other nations' facility maintainance expenses	Data
-Supporting Infrastructure	$ -	$ 97,500,000	$ 97,500,000	$ 132,500,000	$ 167,500,000	$ 230,000,000	$ 257,500,000	$ 355,000,000	$ 355,000,000	$ 355,000,000	Comparable: 1990-2020 FIFA experience	FIFA, 2020
Player Development Spending	$ 78,943,994	$ 126,724,097	$ 182,656,271	$ 238,900,516	$ 295,456,833	$ 332,725,220	$ 333,817,468	$ 334,909,717	$ 336,001,965	$ 337,094,214		
- Number of Academy Clubs sponsored	20	50	100	150	200	200	200	200	200	200		
- Cost to run an academy club	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	Comparable: EPL Academy Program	EPL, 2018
- % sponsorship	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%		
- Total cost of academy club sponsorship	$ 7,840,000	$ 19,600,000	$ 39,200,000	$ 58,800,000	$ 78,400,000	$ 78,400,000	$ 78,400,000	$ 78,400,000	$ 78,400,000	$ 78,400,000		
- Number of 18 year olds	2666400	2678102	2689805	2701508	2713210	2724913	2736616	2748318	2760021	2771724	Population projection, uniform distribution of age	
- Number of schools	8888	8927	8966	9005	9044	9083	9122	9161	9200	9239	OECD: 300 students per school	OECD, 2020
- % of schools covered	20%	30%	40%	50%	60%	70%	70%	70%	70%	70%		
- Cost to run education program	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	Comparable: Australian and UK Schools Football program	ABC, 2020 UK Schools Football Organisation, 2018
- Cost of education program	$ 71,103,994	$ 107,124,097	$ 143,456,271	$ 180,100,516	$ 217,056,833	$ 254,325,220	$ 255,417,468	$ 256,509,717	$ 257,601,965	$ 258,694,214		
Total	$ 1,143,048,994	$ 1,538,363,517	$ 1,652,179,380	$ 1,874,304,097	$ 2,099,892,819	$ 2,392,008,730	$ 2,546,435,251	$ 2,914,529,039	$ 2,993,979,957	$ 3,077,487,699		

A9: Financials – Profits

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
3 Profit	$ 2,423,316,539	$ 2,451,855,079	$ 2,834,797,473	$ 3,376,015,361	$ 4,479,858,709	$ 4,793,200,034	$ 5,250,801,067	$ 5,580,770,789	$ 6,308,584,389	$ 7,020,124,822
CAGR	11.22%									
ROI	212.00%	159.38%	171.58%	180.12%	213.34%	200.38%	206.20%	191.48%	210.71%	228.11%

A10: Alternate Strategy Considerations

Our team has considered other implementation strategies which are represented in the below matrix. Through analysis of strategic alignment, effectiveness and feasibility, we have selected the top strategies.



As the purpose of the strategy is to build a Rarita national team, a key consideration is the balance between Rarita and overseas expertise. Outsourcing resources and training to other nations' may allow greater success due to existing experience with the tournament compared to Rarita's new entry status. However, this results in a lack of Rarita representation and leakage of Rarita resources and income. Hence, there is often an ethical tradeoff between probability of success and Rarita representation.

A11: Analysis of Stakeholders

Investors and partners

Objective: Differs from regular shareholders, seeking sports performance over financial profits.

Risks: Low ROI - wage increases for improved results do not increase revenues proportionately.

Government

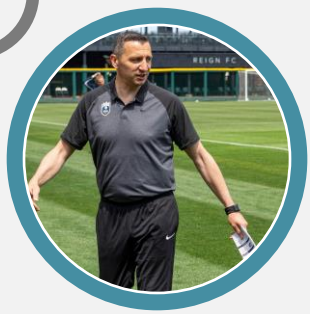
Objective: Improved public image to increase tourism, population health and to support the local economy.

Risks: Risky investment with uncertain outcomes.

National players

Objective: Sporting & Salary

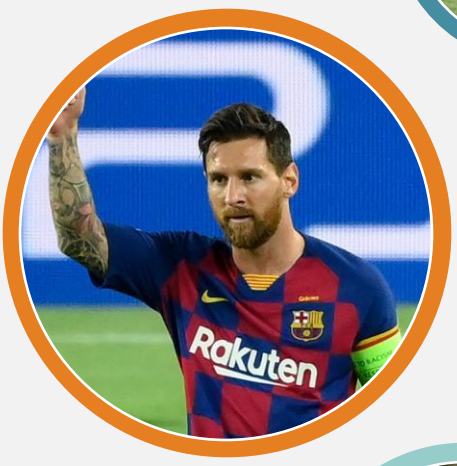
Risks: Loss of public image, unemployment due to poor off-season demand.

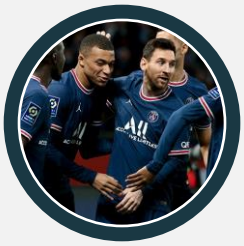


League Authorities & Staff

Objective: Improved image of soccer and advertisement revenue.

Risks: Litigation risk – poor player management and welfare.





Communities

Objective: Improved sporting infrastructure and creation of national sporting identity.

Risks: Inefficient use of taxpayer funds. Stadiums left unused after one-off hosting of major sporting events – Olympics, FIFA.

A12: UEFA SROI

For our analysis, we have used the GROW SROI model developed by the Union of European Football Associations (UEFA) which has been applied to over 60 countries' national and local football programs (UEFA, 2020). This model was chosen due:

- strong reputation and endorsement by European Union, World Health Organisation and United Nations
- Applied to many countries -> highly documented
- For countries where data is not readily available, the model has general parameters and methodology that can be applied which represents the international experience – this is useful since not much Rarita data is available.
- Its applications in developing a business case to attain government grants and sponsorships by quantifying the benefits of football.

The outcomes can be mapped as follows:

Economic	Social	Health
Facility Development	Improved educational attainment	Reduced hypertension
Facility Hire	Improved school attendance	Reduced heart disease
Participant Spending	Reduced NEET	Reduced strokes
Employment	Reduced adult crime	Reduced diabetes
	Reduced youth crime	Reduced breast cancer
	Volunteering	Reduced colon cancer
		Reduced dementia
		Reduced osteoporosis
		Reduced schizophrenia
		Reduced anxiety
		Reduced depression
		Improved subjective wellbeing
		Football injuries

A12: Socio Economic Impact

		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Notes	Source
conomic													
acility Development	from financial forecast at GVA ratio	$ 916,667	$ 244,666,667	$ 244,666,667	$ 332,166,667	$ 419,666,667	$ 575,916,667	$ 644,666,667	$ 888,416,667	$ 888,416,667	$ 888,416,667	from financials GVA ratio based on UEFA modelling	UEFA, 2021
articipant spending	spending per participant (e.g. buying equipment)	150	150	150	150	150	150	150	150	150	150	Comparable: EU satellite research	European Commission, 2018
	total	$ 157,650,886	$ 173,507,698	$ 189,973,019	$ 207,053,059	$ 224,754,032	$ 243,082,150	$ 262,043,626	$ 281,644,672	$ 301,891,501	$ 322,790,325	spending x population	
mployment	sports industry employment	35034	38557	42216	46012	49945	54018	58232	62588	67087	71731	Comparable: UEFA player to participant ratio	UEFA, 2021
	local construction industry	0	5000	5000	10000	15000	15000	10000	15000	15000	15000	Comparable: 1990-2020 FIFA experience - stadium to employment ratio	FIFA, 2020
	average salary	$ 31,644	$ 32,459	$ 33,273	$ 34,087	$ 34,901	$ 35,715	$ 36,530	$ 37,344	$ 38,158	$ 38,972	Projected GNI per capita	Data
	total	$ 1,108,612,494	$ 1,413,806,036	$ 1,571,015,484	$ 1,909,274,934	$ 2,266,673,464	$ 2,465,020,043	$ 2,492,492,074	$ 2,897,430,550	$ 3,132,289,684	$ 3,380,122,369		
ourism	additional visitors	300000	315000	330750	347288	364652	382884	402029	422130	443237	465398	Comparable: EU and UK experience	Visit Britain, 2019 Gholipour HF, Arjomandi A, Marsiglio S, Foroughi B. 2020 Rudkin, Simon and Sharma, Abhijit, 2017
	average bonus spending per visit	$ 1,016	$ 1,067	$ 1,120	$ 1,176	$ 1,235	$ 1,297	$ 1,362	$ 1,430	$ 1,501	$ 1,577		
	total	$ 304,878,600	$ 336,128,657	$ 370,581,844	$ 408,566,483	$ 450,444,547	$ 496,615,113	$ 547,518,162	$ 603,638,774	$ 665,511,748	$ 733,726,703		
Economic activity from direct football activity (revenues)		$ 2,853,092,426	$ 3,192,174,876	$ 3,589,581,483	$ 4,200,255,566	$ 5,263,801,223	$ 5,748,167,011	$ 6,237,789,054	$ 6,796,239,862	$ 7,442,051,477	$ 8,078,090,017	from financials + deadlift of 20% to reflect overlap with tourism modelling	

		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Notes	Source
Social													
Human Capital uplift (salary increase, improved education outcomes)	average salaries	$ 31,644	$ 32,459	$ 33,273	$ 34,087	$ 34,901	$ 35,715	$ 36,530	$ 37,344	$ 38,158	$ 38,972		
	uplift due to participation in sport	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	Comparable: OECD experience - effect of sports on salary, education and employment outcomes	PISA, 2010 Allen, 2013
	total	$ 66,516,749.62	$ 75,090,794.88	$ 84,279,092.65	$ 94,104,285.12	$ 104,589,284.21	$ 115,757,271.67	$ 127,631,699.01	$ 140,236,287.52	$ 153,595,028.28	$ 167,732,182.16		
Reduced crime	prevalence rate of crime	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%		
	impact of participation on reducing crime	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
	number of cases averted	2627.51	2891.79	3166.22	3450.88	3745.90	4051.37	4367.39	4694.08	5031.53	5379.84		
	average annual cost of a case	500000	500000	500000	500000	500000	500000	500000	500000	500000	500000	Comparable: EU Experience and UN research into effects of sport on reduction of crime	Meek, 2018 UK Ministry of Justice, 2020 UN, 2020
	total	$1,313,757,380.63	$1,445,897,485.98	$1,583,108,487.97	$1,725,442,157.64	$1,872,950,266.02	$2,025,684,584.16	$2,183,696,883.09	$2,347,038,933.84	$2,515,762,507.47	$2,689,919,375.00		
Volunteering	value per participant	1646.463	1646.463	1646.463	1646.463	1646.463	1646.463	1646.463	1646.463	1646.463	1646.463	Comparable: UK volunteering in sports	Fujiwara, 2014
	number of adults participating	100,000	102000	104040	106121	108243	110408	112616	114869	117166	119509		
	total	$164,646,300.00	$167,939,226.00	$171,298,010.52	$174,723,970.73	$178,218,450.15	$181,782,819.15	$185,418,475.53	$189,126,845.04	$192,909,381.94	$196,767,569.58		
Total Social		$1,544,920,430.24	$1,688,927,506.85	$1,838,685,591.15	$1,994,270,413.49	$2,155,758,000.38	$2,323,224,674.98	$2,496,747,057.63	$2,676,402,066.41	$2,862,266,917.70	$3,054,419,126.74		

A12: Health Impacts

		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Notes	Source
Health													
Reduced healthcare costs	prevalence rate of health condition	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%		
	impact of participation on reducing risk	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	Comparable: Worldwide rates of disease	WHO,2020 CDC,2021
	number of cases averted	63060.35	69403.08	75989.21	82821.22	89901.61	97232.86	104817.45	112657.87	120756.60	129116.13		
	average annual cost of a case	1838	1875	1913	1951	1989	2027	2064	2102	2140	2178		
	total	**$115,884,293.21**	**$130,161,479.34**	**$145,383,472.72**	**$161,582,701.34**	**$178,791,968.61**	**$197,044,453.39**	**$216,373,709.95**	**$236,813,668.02**	**$258,398,632.74**	**$281,163,284.69**		
Reduced mental wellbeing	prevalence rate of health condition	10%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	Comparable: Academic research into sport impacts on wellbeing	Fujiwara, 2014
	impact of participation on reducing risk	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%		
	number of cases averted	31530.18	34701.54	37994.60	41410.61	44950.81	48616.43	52408.73	56328.93	60378.30	64558.06		
	average annual cost of a case	1170	1170.30	1170.30	1170.30	1170.30	1170.30	1170.30	1170.30	1170.30	1170.30		
	total	**$36,899,766.30**	**$40,611,211.87**	**$44,465,084.72**	**$48,462,838.97**	**$52,605,928.71**	**$56,895,808.05**	**$61,333,931.09**	**$65,921,751.94**	**$70,660,724.70**	**$75,552,303.47**		
Improved subjective wellbeing	value per participant	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	Comparable: Academic research into sport impacts on wellbeing	Fujiwara, 2014
	total	**$420,402,361.80**	**$462,687,195.51**	**$506,594,716.15**	**$552,141,490.44**	**$599,344,085.13**	**$648,219,066.93**	**$698,783,002.59**	**$751,052,458.83**	**$805,044,002.39**	**$860,774,200.00**		
Football injuries (this value is a deduction)	number of injuries per 1000	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	Comparable: Worldwide professional injury rate	Sports Medicine, 2020 NCAA,2018
	number of injuries	7357	8097	8865	9662	10489	11344	12229	13143	14088	15064		
	average annual cost of a case	$ 410	$ 410	$ 410	$ 410	$ 410	$ 410	$ 410	$ 410	$ 410	410		
	total	**$3,013,480.91**	**$3,316,582.30**	**$3,631,315.25**	**$3,957,798.52**	**$4,296,150.84**	**$4,646,490.99**	**$5,008,937.71**	**$5,383,609.74**	**$5,770,625.85**	**$6,170,104.78**		
Total Health		**$570,172,940**	**$630,143,304.42**	**$692,811,958.34**	**$758,229,232.24**	**$826,445,831.60**	**$897,512,837.38**	**$971,481,705.93**	**$1,048,404,269.05**	**$1,128,332,733.98**	**$1,211,319,683.37**		
Total Socio-Economic Benefits		$ 6,540,244,442.70	$ 7,679,354,744.99	$ 8,497,316,044.73	$ 9,809,816,354.27	$ 11,607,543,765.08	$ 12,749,538,497.00	$ 13,652,738,347.39	$ 15,192,176,859.82	$ 16,420,760,728.01	$ 17,668,884,890.66		
Cost of investment		$ 1,143,048,993.54	$ 1,538,363,516.68	$ 1,652,179,380.00	$ 1,874,304,097.25	$ 2,099,892,819.37	$ 2,392,008,729.83	$ 2,546,435,250.76	$ 2,914,529,038.61	$ 2,993,979,956.96	$ 3,077,487,699.06	From financials	
SROI		$ 5.72	$ 4.99	$ 5.14	$ 5.23	$ 5.53	$ 5.33	$ 5.36	$ 5.21	$ 5.48	$ 5.74	Benefits / Expenses	

Construction Industry

∂379 million p.a. GDP uplift; 10,500 jobs p.a.

- Increased investment in infrastructure such as stadiums or transportation will have direct flow on effects on economic activity and create job opportunities for construction workers (KPMG, 2020). The measure of value added reflects the benefits that sporting infrastructure add to the Rarita economy through the construction, operation and maintenance of the facilities.

Tourism Industry

∂492 million p.a. GDP uplift

- The societal uptake in football participation also presents positive socioeconomic impacts through boosting tourism industry revenue. A VisitBritain (2019) study determined the average EPL football spectator tourist will spend 31% more than the average visitor. As such, it is predicted that the football program can produce substantial additional revenue for Rarita's tourism industry.

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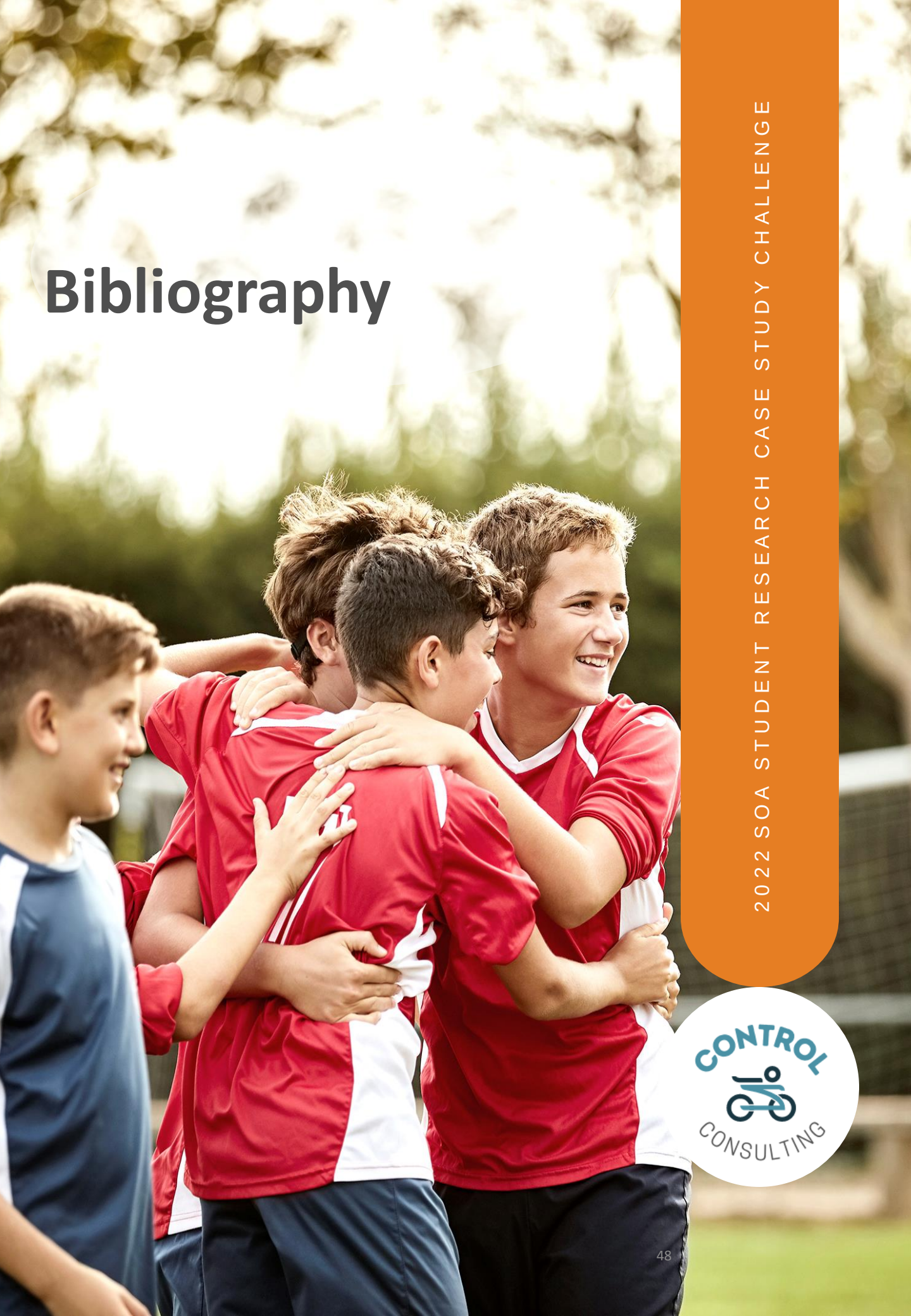

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