RARITA NATIONAL FOOTBALL TEAM

MARCH 27, 2022

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1. Objectives of Analysis

Sport is an integral part of national economy and identity. A strong national team provides opportunities for nations to gain higher global visibility, GDP growth and social cohesion. This analysis aims to construct a football team for the country of Rarita, which balances the trade-off between competitiveness and economic viability. The report explains the selection of a team which can:

- Achieve an FSA championship top-ten ranking in the next five years with an 85% probability
- Win the FSA championship in the next ten years with a 70% probability
- Maximise NPV and create a positive impact on Rarita's economy by efficiently investing a ∂995m allocation

Additionally, the analysis examines key variables affecting value creation, proposes strategies to mitigate various risks, and applies the actuarial control cycle framework to evaluate project performance.

2. Data and Data Limitations

Preliminary data exploration aims to identify any data limitations, potential assumptions, and areas of focus in our analysis.

Data Limitation	Impact
The tournament structure is unknown, and teams' placement is only known up to rank 24th for 2021 and 16th for 2020.	**Assumption:** FSA follows the FIFA World Cup's tournament structure consisting of a round-robin group stage and a single-elimination bracket for the remaining top-16 teams.
There are no explanations on the distinction between tournament and league.	**Assumption:** Tournament is analogous to FIFA World Cup, which operates separately from leagues.
Sponsorship details for tournaments (unlike leagues) are not provided.	**External Research is necessary:** Sponsorship details will be determined via comparison.
Only 2021 tournament player statistics have been given.	The overall reliability of our model will be restricted. We assume that team performance remains constant.
There is no information on population for other countries, only GDP per capita.	A comparison can only be made per-capita rather than on an absolute basis. Items like social media followers and league attendance are difficult to interpret without population information.
There is only one year of overlap between football revenue and tournament results data.	**Forecast:** There will be difficulties in forecasting the economic impact of winning a tournament.
There are discrepancies between league and tournament data. Some players are in tournament but not in league.	**Data Removed:** This will not be considered in our model.

Data pre-processing has been conducted before our analysis. This includes treatment of any data inconsistencies by averaging or ad-hoc adjustment, imputing missing or negative values using a KNN imputation model, and removing columns that are highly correlated with core predictors *(Appendix-1)*.

3. Team Selection

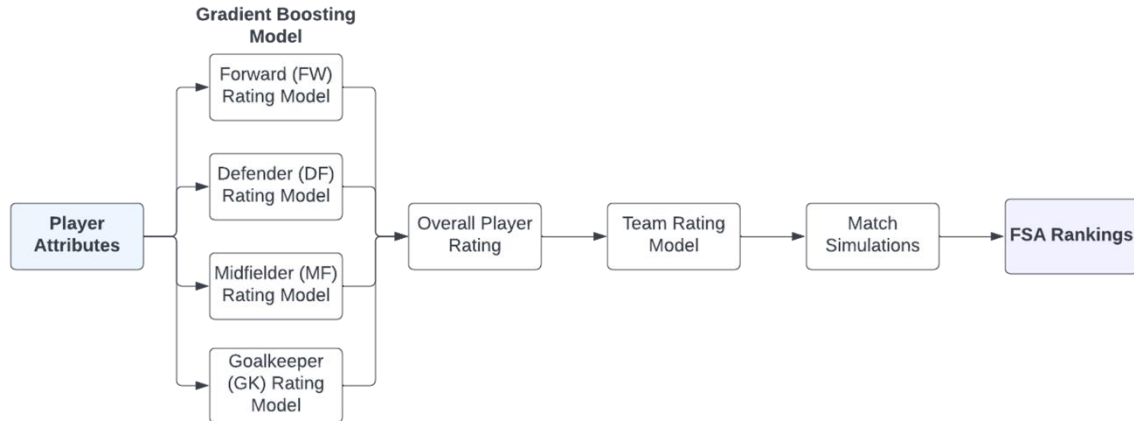## 3.1 Model Building and Assumptions

Figure 1: Team selection and match simulation flowchart

Our team is chosen from a pool of RFL players exclusively to prevent language, cultural and political barriers from impeding overall team cohesion (Malesky, Saiegh 2014). This selection consists of 5 forwards, 7 midfielders, 7 defenders, and 3 goalkeepers. The modelling of individual player ratings assumes the following:

- Salaries of league players are reflective of their skill level.
- The attributes relevant in determining skill level are position-specific. Thus, player ratings for each position should be modelled individually.
- Player performance in leagues translates to tournaments.
- The level of play is consistent across leagues.

Figure 2: Distribution of annualised salary across leagues

Although player salary is the assumed player rating metric, salaries in RFL deviate noticeably compared to other leagues despite RFL players delivering similar performances as shown in *Figure-2*. A model linking player attributes to a standardised salary figure is necessary. The selected player-rating model is a gradient boosting model (GBM) trained on the non-RFL player league data.
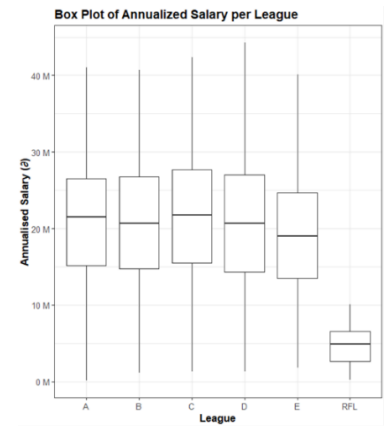
Further, a team rating model is created to rate team performance and calculate the probability that a team wins a matchup. This model:

1. Determines a team's position score by averaging standardised salaries over each player position.
2. Calculates the difference between two competing team's position scores.
3. Inputs the differences in position scores into a GBM that outputs the probability of winning the matchup.
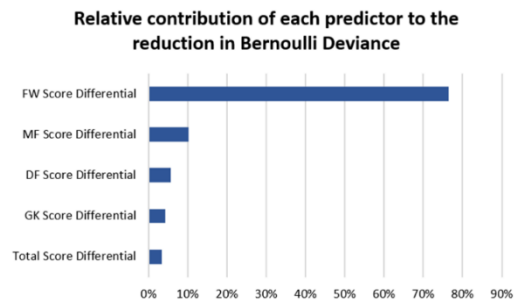
Figure 3: Relative influence of each predictor

Figure-3 suggests that the differential in FW team scores is the most significant predictor in this GBM, highlighting the necessity of strong FW players.

Finally, the probabilities of winning the FSA championship in 10 years and reaching top-10 in 5 years are obtained by simulating FSA tournament bracket outcomes using the assumed tournament structure and single matchup wins probabilities. Additional details regarding model selection have been provided in *Appendix-2*.

3.2 Player Selection

Our goal is to enlist the most cost-efficient RFL players for player selection that maximise economic impact. These players exhibit the highest standardised-to-annualised salary ratio, delivering high performance at low cost (circled in *Figure-4*). However, player selection is restricted to the top 25% highest-paid players to meet our FSA performance objectives, resulting in the national team selection in *Table-1*. Without this additional restriction, sufficient competitiveness is not achieved *(Appendix-3)*.
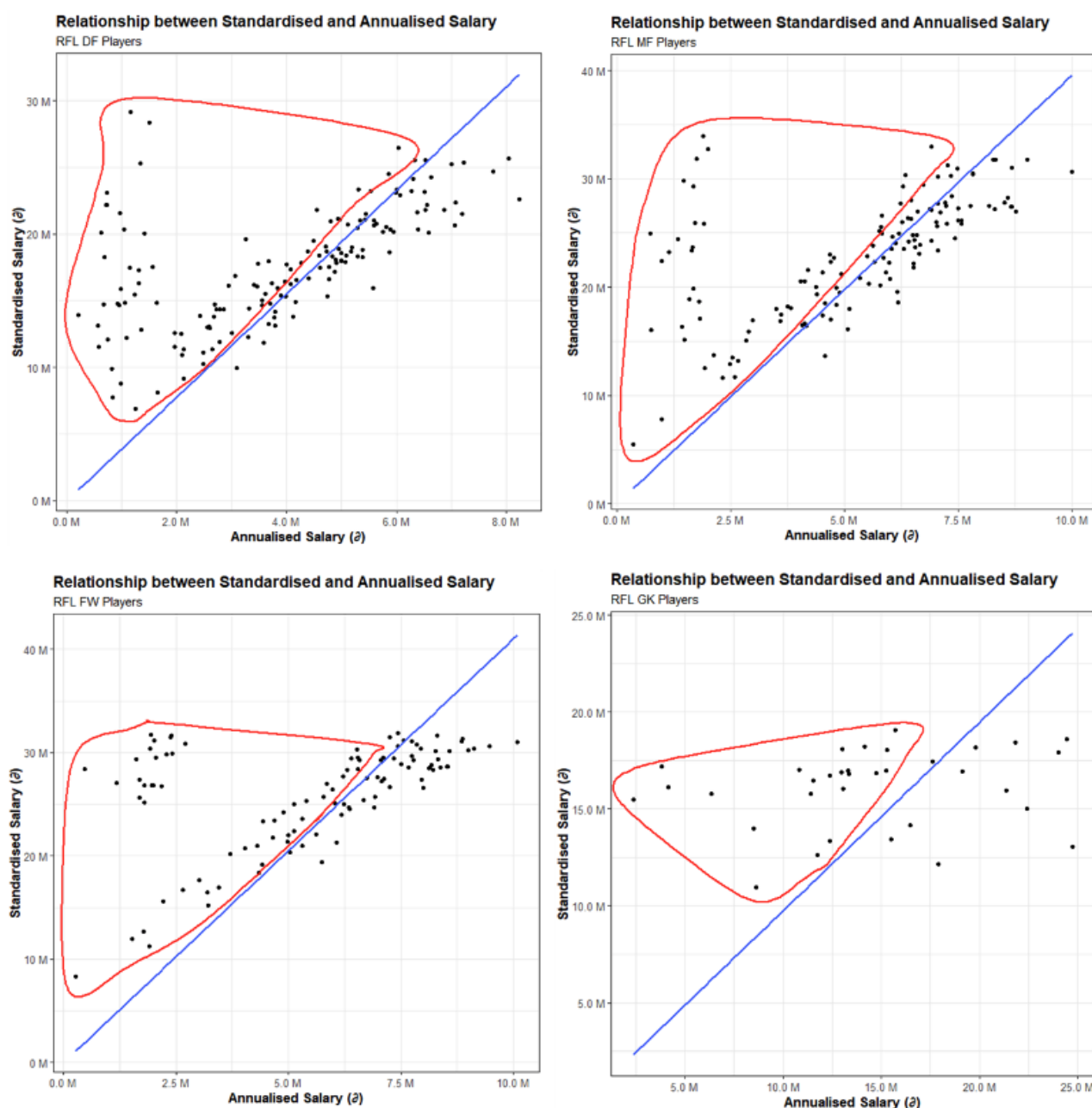

Figure 4: Relationship between standardised and annualised salary across player roles in RFL

Player	Position	Annualised Salary	Standardised Salary
Z. Nyamahunge	GK	∂7,740,000	∂17,682,123
Y. Draru	GK	∂11,390,000	∂16,486,694
Y. Acola	GK	∂12,290,000	∂16,113,889
M. Beck	DF	∂8,050,000	∂25,675,318
C. Baluka	DF	∂7,760,000	∂24,692,559
U. Arthur	DF	∂7,080,000	∂22,332,739
Q. Sano	DF	∂7,200,000	∂21,477,388
N. Tamura	DF	∂8,240,000	∂22,574,533
O. Balog	DF	∂9,730,000	∂17,641,595
P. Chi	DF	∂12,610,000	∂19,424,221
J. Namirembe	MF	∂8,330,000	∂31,781,082
G. Jankowski	MF	∂9,020,000	∂31,751,715
D. Bengtsson	MF	∂8,190,000	∂27,501,565
L. Leibowitz	MF	∂8,600,000	∂28,263,294
Q. Gruber	MF	∂8,310,000	∂27,225,287
S. Barman	MF	∂8,680,000	∂27,450,388
Q. Morrison	MF	∂8,770,000	∂26,983,676
A. Kyarikunda	FW	∂8,870,000	∂31,332,321
B. Elbaz	FW	∂8,530,000	∂28,660,740
Z. Zziwa	FW	∂9,120,000	∂30,423,769
K. Kazlo?	FW	∂9,470,000	∂30,618,809
E. Mudzingwa	FW	∂16,240,000	∂29,252,463

Table 1: Players selected for Rarita national team and their characteristics

3.3 Competitiveness of Proposed Team
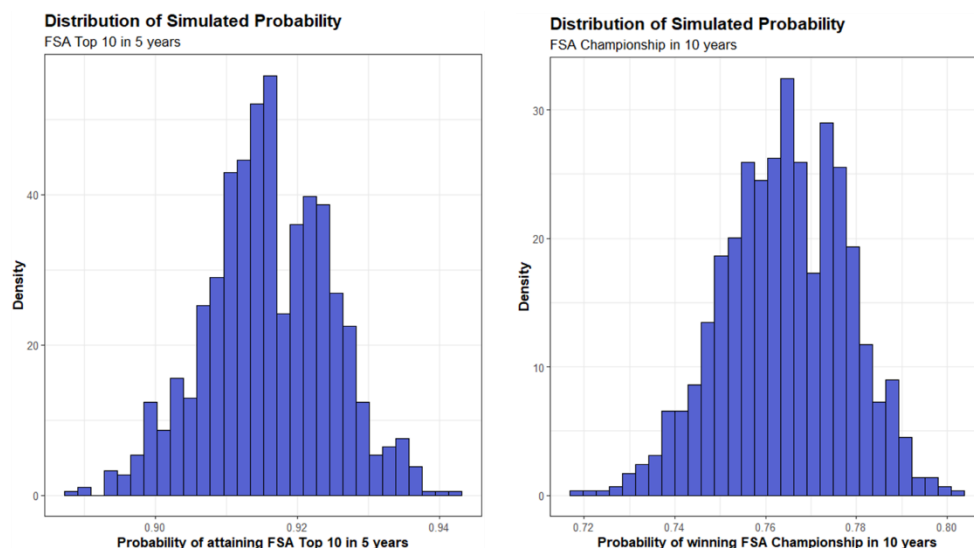
Figure 5: Simulated probability distributions for attaining FSA top 10 and championship

Figure-5 demonstrates that the selected national team comfortably exceeds the performance constraints. Here, the 95% confidence interval for the probabilities of attaining an FSA championship top-10 in 5 years and winning the FSA championship in 10 years is $(91.540\%, 91.647\%)$ and $(76.332\%, 76.500\%)$ respectively. These are well above the corresponding 85% and 70% thresholds established.

3.4 Limitations of Team Selection

Several limitations were inherent to the modelling process:

- It is assumed that all teams in FSA maintain the same team composition over ten years and that players remain at their skill level (ignoring skill-growth and aging). This is unlikely to be valid in practice.
- Alternative models such as neural networks and AdaBoost were not considered and may have exhibited higher predictive power.
- Models are fitted using a validation-set approach, removing the incorporation of potentially valuable information. The resulting model is dependent on which observations are included in the training and validation sets.

4. Economic Impact

4.1 Revenue

The project will source its revenue through FSA tournament support and sponsorship. Assuming FSA follows a similar prize structure to FIFA's World Cup, each participating team will receive a fixed share of the overall prize-pool and additional prize money based on final placement (Staffin, 2022). FSA's 2022 prize-pool is estimated to be 25% of FIFA's 2018 Russia World Cup due to its yearly frequency, meaning that Rarita will receive ~ð2.618m of fixed annual tournament support, and up to ð7.531m of variable prize money depending on tournament outcome (*Table-2*).

The majority of revenue will be sourced through sponsorships and are assumed to be comparable to the top-ten FIFA football teams. Here, it is assumed that tournament participation contributes to 30% of the reported sponsorship revenues generated by FIFA teams. Additionally, we conservatively assume a 5-year ramp-up before obtaining the total sponsorship amount. This will account for the time taken for the team to develop and gain recognition. See *Appendix-4* for details on revenue calculations.

Tournament support	FIFA World Cup 2018	FSA Tournament 2022
Total price pool	$ 791,000,000	ð 217,998,681
Winner	$ 38,000,000	ð 10,472,756
Runner-up	$ 28,000,000	ð 7,716,767
3rd	$ 24,000,000	ð 6,614,372
4th	$ 22,000,000	ð 6,063,174
5th-8th	$ 16,000,000	ð 4,409,581
9th-16th	$ 12,000,000	ð 3,307,186
Eliminated groups	$ 8,000,000	ð 2,204,791
Participation	$ 1,500,000	ð 413,398
Other	$ 343,000,000	ð 94,530,401

Table 2: FIFA and FSA tournament support for 2020
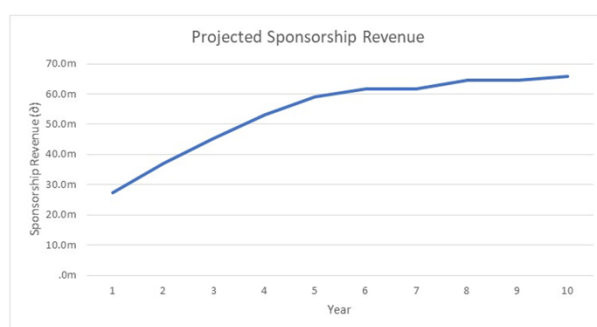
Figure 6: 10-Year projected revenue based on top 10 FIFA teams

4.2 Costs

The cost model assumes that player salaries and operational costs are the two main cost drivers. It is constructed on the basis that FSA's tournament has the same operating margin as RFL. The national team will budget its operational costs as a percentage of tournament support based on projected operating margins for RFL (*Appendix-5*). Further, player salaries contribute to the majority of overall costs and are expected to be 25% of players' league salaries due to FSA's shorter duration.

Assumption	Rationale	Impact
All players will accept 10-year contracts.	Long-term contracts will maintain team structure and do not correlate with poor performance (Gómez et al. 2019).	Reduce the cost of sourcing new players in the future.
Tournament support and sponsorships exhibit a real growth rate of 2%.	Consistent with the past 5-years of historical data.	Steady growth in revenues.

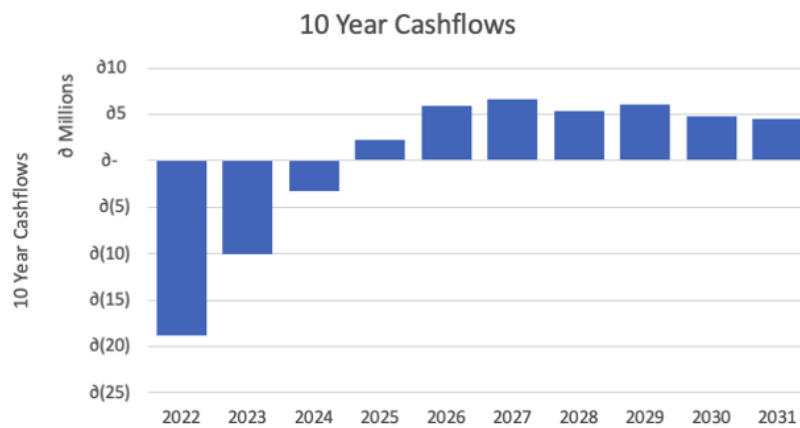## 4.3 NPV and Sensitivity Analysis

Figure 7: Cashflow analysis

The analysis suggests that this project exhibits a positive NPV of ∂3.462m and an IRR of 7.94%. Additionally, Rarita's government funding of ∂995m comfortably covers the initial discounted loss of ∂32.12m. However, value-creation is sensitive to assumptions made on key variables:

- A WACC of 5.97% is applied assuming that this industry average hurdle rate adequately reflects the business risk within the football team space. WACCs above 7.94% will lead to negative NPV.
- Project sustainability relies heavily on sponsorship cashflows, where a 0.90% reduction will result in negative NPVs. Nevertheless, government funding generates sufficient loss coverage in all scenarios.
- Assuming salary growth equals yearly inflation, the project will obtain negative NPVs if base salaries increase by 0.88%, though no additional funding will be required until a 242.99% rise in salaries.

		Player Salary				
	Adjustments	-20%	-10%	0%	10%	20%
	20%	∂158,586,073.89	∂119,347,443.91	∂80,108,813.93	∂40,870,183.95	∂1,631,553.97
	10%	∂120,263,372.77	∂81,024,742.79	∂41,786,112.81	∂2,547,482.83	∂(36,691,147.15)
Sponsorship	0%	∂81,940,671.64	∂42,702,041.66	∂3,463,411.68	∂(35,775,218.30)	∂(75,013,848.28)
	-10%	∂43,617,970.52	∂4,379,340.54	∂(34,859,289.44)	∂(74,097,919.42)	∂(113,336,549.40)
	-20%	∂5,295,269.40	∂(33,943,360.58)	∂(73,181,990.56)	∂(112,420,620.54)	∂(151,659,250.52)

Table 3: Sensitivity analysis for adjustments to player salary and sponsorships

		Prize pool growth rate				
		0%	1%	2%	3%	4%
	4%	∂6,650,295.41	∂7,178,797.92	∂7,707,300.43	∂8,235,802.94	∂8,764,305.45
	5%	∂4,497,710.42	∂4,991,604.43	∂5,485,498.44	∂5,979,392.46	∂6,473,286.47
WACC	6%	∂2,539,279.25	∂3,001,345.47	∂3,463,411.68	∂3,925,477.90	∂4,387,544.11
	7%	∂756,871.50	∂1,189,633.64	∂1,622,395.79	∂2,055,157.93	∂2,487,920.07
	8%	∂(865,797.55)	∂(460,046.26)	∂(54,294.97)	∂351,456.33	∂757,207.62

Table 4: Sensitivity analysis for adjustments to player salary and sponsorships

4.4 Reserves and Investment Strategy

Reserves are established in accordance with the pessimistic scenario where:

- Sponsorship revenues are 20% lower than expected, and
- Player salaries are 20% higher.

The remaining excess funds will be invested into Vanguard's Balanced Index Fund, providing domestic and international exposure to equity and fixed interest markets *(Appendix-6)*.
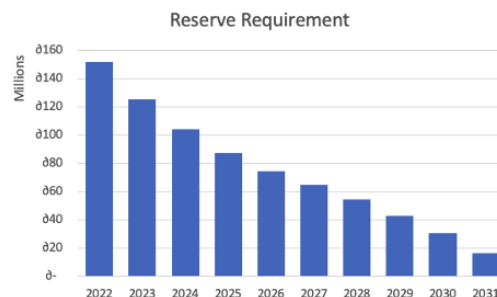

Figure 8: Reserve required to fund cashflows under pessimistic scenario

4.5 Broader Economic Impact

Advancement in sports facilitates GDP growth through events, merchandise sales, infrastructure and sporting clubs. The correlation between tournament placements and league profits *(Figure-9)* exemplifies the positive financial impact a highly ranked national team can deliver through event facilitation.
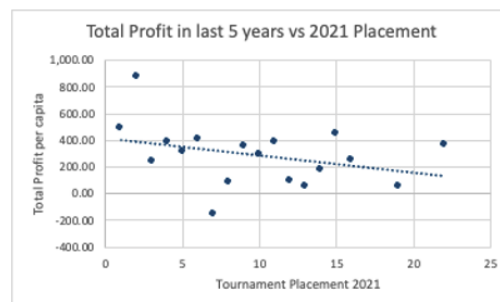

Figure 9: Relationship between 2021 tournament placement and total league profits for all tournament participating teams

Due to the unique demographic and social-economic profiles of Rarita provinces, sporting activities are expected to contribute up to 2% of GDP-per-capita in East Rarita and 0.5% GDP in West Rarita (Department of Health Australia, 2020). Additionally, evidence suggests that increasing sports participation across Rarita will enhance physical activity levels (Lee et al., 2008) and reduce healthcare spending per-capita. Furthermore, sport-related employment accounts for an average of 1.5% of total employment in some European countries (Department of Health Australia, 2020) with growth potential in many sport-related industries. Hence, continuing investments in the national team will not only generate positive economic impact, but also provide new employment opportunities (See *Appendix-7*).

4.6 Limitations

Limitations of the economic impact analysis:
- The impact of investment returns, and loaning players externally are not considered. This is a source of revenue that may bolster NPV.
- Estimating tournament operating costs using league data is not as accurate as a bottom-up, detailed costing model.
- The model assumes that providing 25% of a player's annualised league salary, based on a 3-month tournament length, is competitive remuneration.
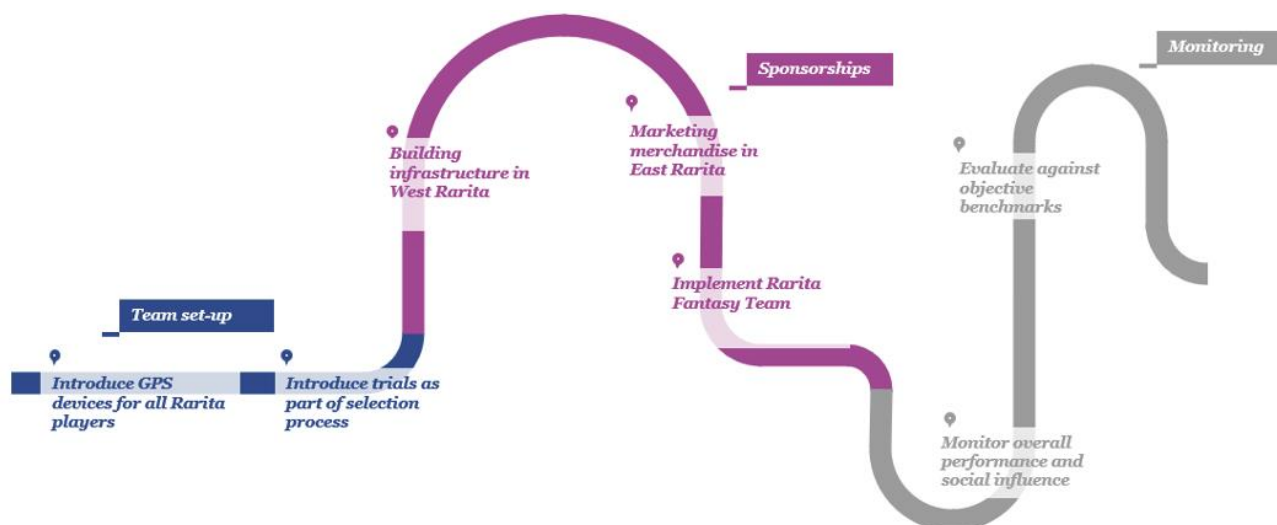
5. Implementation Plan

5.1 Road Map

Figure 9: Implementation roadmap

5.2 Team set-up

We suggest using GPS trackers to accurately record in-game metrics (e.g. acceleration) to personalise player training, monitoring and rehabilitation. This will reduce injury risk and improve player performance. To accommodate new talents and qualitative team skills (e.g. communication), budget will be allocated to setting up in-person trials. Players selected by the model and coaching staff will attend a boot-camp until a finalised team is created.

5.3 Marketing and Sponsorships

Project success is contingent on generating adequate levels of sponsorship income. This requires an initial investment into the Raritan football scene to generate public interest. The investment will be allocated towards:

- Funding football infrastructure (e.g. stadiums, playing fields). This should predominantly be built in West Rarita due to its lower GDP-per-capita and higher population density compared to other provinces. This maximises social impact by providing entertainment venues for the public, whilst also providing economic value through job creation.
- Target marketing towards affluent provinces that will likely have higher consumer demand for football merchandise.

Historically, it has been proven that having more football infrastructure in a country positively impacts the national team's performance (Batarfi & Reade, 2021). To boost football interactions throughout Rarita, part of the marketing scheme will allow individuals to create their own fantasy national teams (like Fantasy Premier League). Fantasy sports players have been shown to identify more strongly with their chosen teams. They also attend more games, consume more content, and spend more on merchandise compared to non-fantasy players (Karg & McDonald, 2010). This program also provides an avenue for us to monitor interest in football. Marketing through social media platforms is also a lucrative opportunity given that there are currently 17 million Raritan Facebook users (exceeding the population of Rarita).

5.4 Monitoring

To evaluate player performance, we suggest using position-specific metrics shown in *Table-5* which are supported by our GBM player-rating model and external research *(Appendix-9)*:

FW	MF	DF	GK
• Total Shots attempted • Shots on target • Shooting efficiency • Expected Goals	• Crosses • Passes lead directly to a shot • Completed passes metrics	• Interceptions • Clearance • Tackles • Blocks	• Saves • Goals against

Table 5: Position-specific metrics for performance evaluation

The following flowchart provides a framework to update the national team based on annual monitoring of the national team's competitiveness against benchmark probabilities:
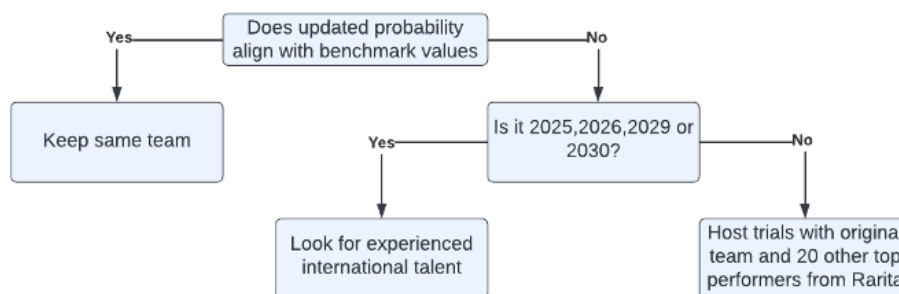
Figure 10: A decision tree to assist with forming a competitive national team
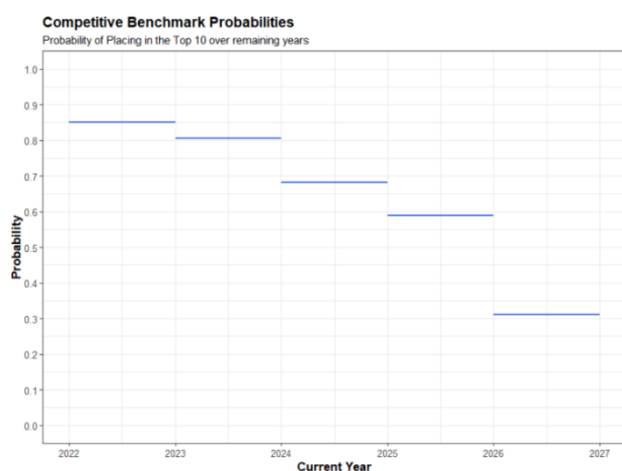

Figure 11: A benchmark for the probability of placing in the top 10 by 2027 for any given year
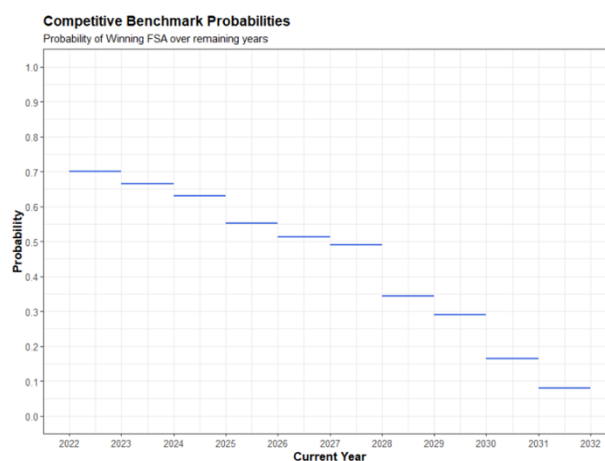

Figure 12: A benchmark for the probability of winning the FSA by 2032 for any given year

Note that these benchmark probabilities are subject to variation due to factors such as changes in the competitive landscape. Hence, this should only be used as a guideline.

6. Ethics

This section will discuss the ethical implications of investing in the different Raritan provinces by applying Dobrin's framework (2008).

Identify Stakeholders
- Population of Raritan provinces who will receive the effects of investment.
- Raritan Government and Commissioner of Sports are interested in establishing a competitive football team that creates positive economic impact.

Identify Core Values
This decision concerns the government's social responsibility to maintain fairness when allocating investments throughout Raritan provinces.

Courses of Action and Consequences
There are two investment options outlined below that aim to balance ethical considerations and economic growth:

Focus on investments in the East:
Exclusively investing in the more developed East province will deliver the greatest short-term economic return. Governments benefit the most from this due to increased economic activity and tax revenue. This, however, disproportionately excludes the poorer provinces that require this funding the most.

Spreading investments across provinces:
Although the economic impacts for this option are more long-term, allocating portions of investment to West Rarita will create the greatest social impact. This equitable distribution will aid in developing a unified national identity and provide job opportunities to those in poorer provinces.

Applying a utilitarian approach, spreading investment across provinces is the option that will benefit the majority.

How will it be perceived?
The advised choice should be perceived positively amongst all shareholders except for the Raritan Government who forego short-term economic growth for a stronger social and cultural environment in Rarita in the long-term.

Justification
Although the action hinders the initial objective of boosting economic prospects, we believe developing a stronger national identity and culture will lead to longer-term social and economic benefits.

7. Risk and Risk Mitigation Considerations

7.1 Key Identifiable risks

The project is subject to various risks impacting the likelihood of successful implementation. Additional risk analysis has been included in *Appendix-10*.
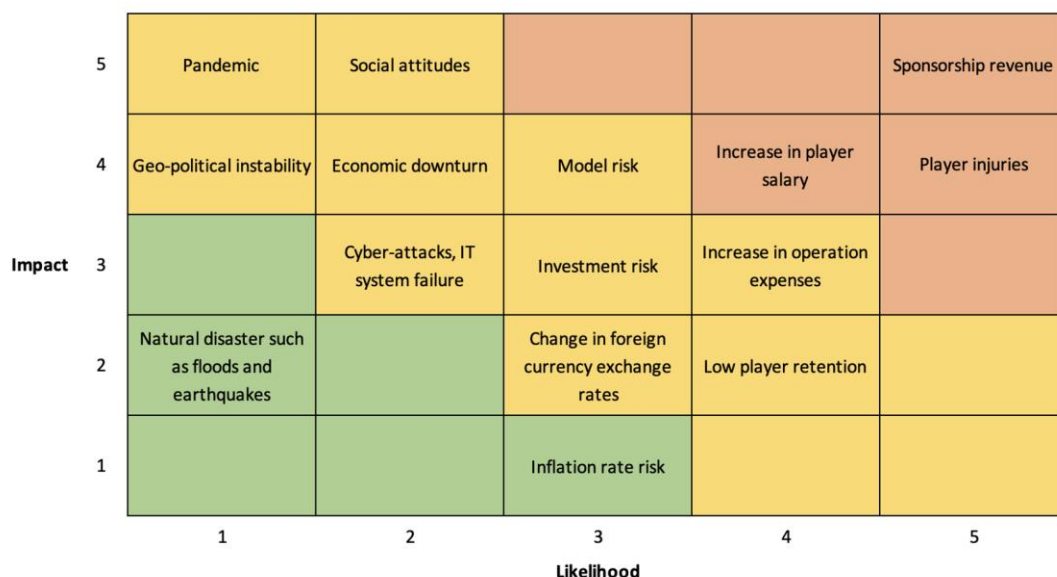
Figure 13: Risk heatmap

7.1.1 Financial Risks

Risk	Description	Impact & Mitigation
Market Risk	• Excess funding and cashflows generated from the project are reinvested. • Systematic and systemic market shocks may cause abnormal losses.	• Diversified investment strategy exhibits a 1-year 99.5% return VaR of *13.53%*.
Inflation rate risks	• Upward pressure on operational costs and salaries.	• Mostly hedged since the timing and size of revenue cashflows mostly match expenses.
Foreign-Exchange Risk	• Devaluation of Raritan currency reduces value of investment and tournament support.	• Hedge FX rates using currency futures, options or swaps.

7.1.2 Operational Risks

Risk	Description	Impact	Mitigation
Injuries	Players unable to participate in competitions.	• Detrimental to team's competitive performance.	• Provide appropriate care. • Maintain a roster of equally-rated benched players.
Sponsorship revenue	Over 90% of revenue consists of sponsorships.	• Profits decrease if unable to secure/renew major sponsorship agreements. • Impede on ability to support team and offer competitive salary.	• Maintain and enhance global brand reputation to continually provide value to sponsors. • Set aside reserves to absorb impact of lower sponsorship revenue.
Players' salaries	~98% of expenses are comprised of player salaries.	• In the competitive football market, high-performing players seek better remuneration, which can largely impact costs.	• Select equally-rated players from the bench. • Players are provided bonuses based on tournament placement. • Establish reserves to absorb risk.
Cyber-attacks, IT-system disruption	Systems prone to data theft and cyber-attacks.	• Compromise operations • Reputational loss	• Establish access management systems.

7.1.3 Other Risks

Risk	Description	Impact	Mitigation
Social Attitudes	Rarita already exhibits low league attendance rates compared to other nations.	• Investment may not spark interest in football.	• Transition football infrastructure for use in other sports. • Analyse public interest in other sports. These may be worthwhile investment.

7.2 Mitigation Strategies for Unidentifiable Risks

Quarterly risk meetings will be held to identify any new relevant risks impacting our project. The likelihood and impact of these risks will be evaluated, and an appropriate mitigation strategy to manage each risk according to our risk tolerance will be developed.

8. Conclusion

Through extensive analysis, it is evident that the proposed national team effectively balances the trade-off between competitiveness and economic viability; comfortably exceeding its performance objectives. The project is economically feasible given its positive NPV and effectively considers key risks inhibiting successful implementation. It also considers the nature of Raritan demographics, ensuring marketing strategies and football investments are tailored towards provincial needs and adhere to ethical frameworks. Although the project will likely deliver a positive economic impact to Rarita, regular monitoring of team performance and public interest in the Raritan football program will be crucial to project success.

Appendix

Appendix 1 – Data & data limitations

Correlated variables are found to exist in 3 main sections in the player data set (excluding goalkeeper data):
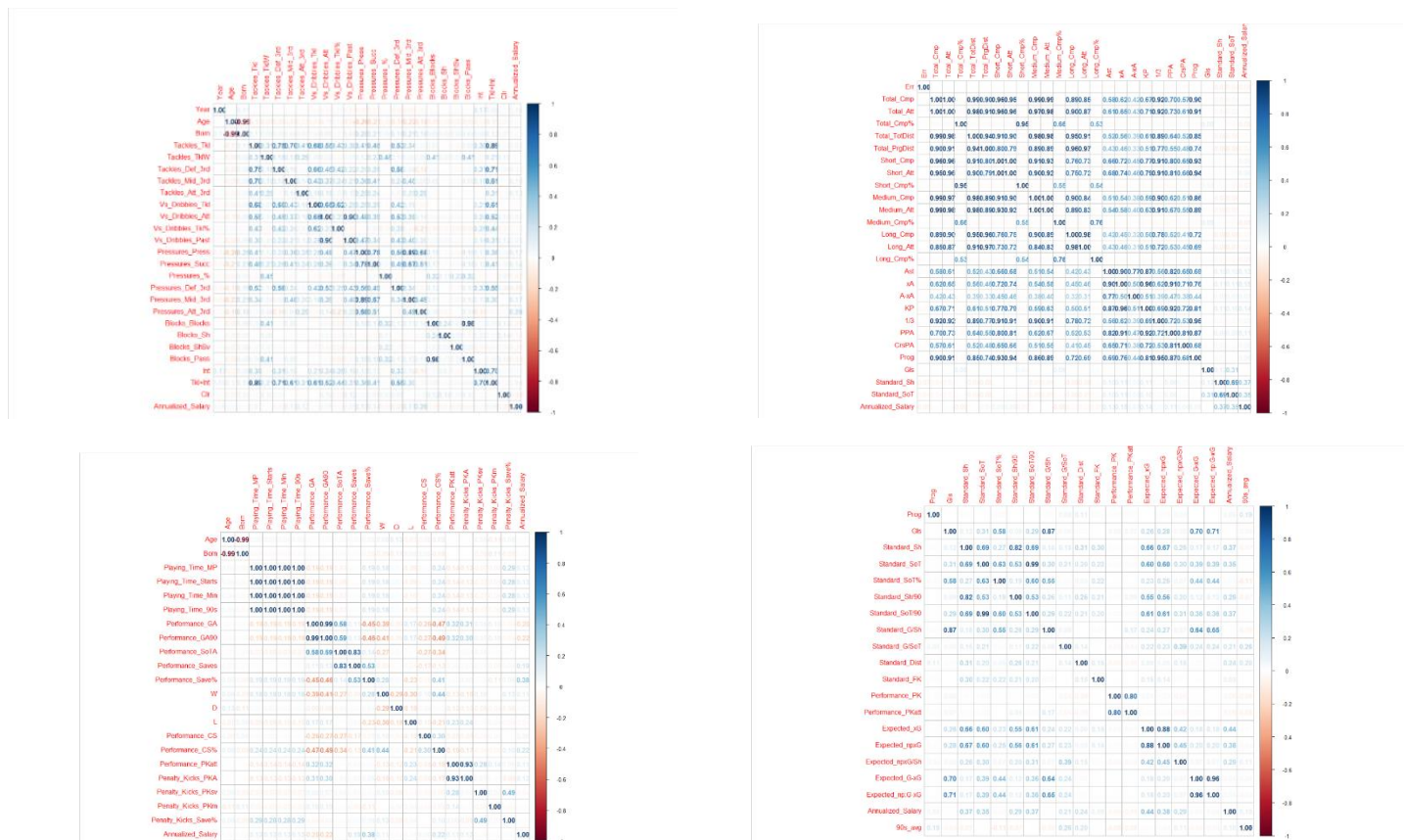
A filter restricting maximum correlation to 65% is applied to variables. This producea the following list of variables to keep:

```
keep_player <- c('Age','Tackles_Tkl','Vs_Dribbles_Att','Pressures_%','Blocks_Sh',
        'Int','Clr','Total_Cmp%','xA','Standard_SoT/90',
        'Standard_Sh/90','Standard_G/SoT','Standard_Dist','Standard_FK',
        'Performance_PK','Expected_xG','Annualized_Salary','90s_avg')

keep_goal <- c("Player","Nation","Pos_new","League",'Age','Playing_Time_90s','Performance_GA90','Performance_Saves',
        'Performance_Save%','W','D','L','Performance_CS','Performance_CS%','Penalty_Kicks_PKA',
        'Penalty_Kicks_PKsv','Penalty_Kicks_PKm','Penalty_Kicks_Save%',
        'Annualized_Salary')
```

To ensure data and models are reproducible across multiple members. We employ Git version control and emphasise the use of source code and functions rather than saving temporary data files.

We consider each player profile to consist of the primary keys: players, nation, league, year. These four characteristics form the basis of the left joins conducted. Across different League Shooting, Passing and Defense, various players show inconsistent "90s", "Nation" and "League", results which need to be standardised to remove duplicated entries. Identical columns are removed and columns with minor inconsistencies were adjusted.

Appendix 2 – Team selection: Model building and assumptions

Player-rating model

To develop a predictive model linking player attributes to salaries, the evaluation criteria of validation-set error is used. The non-RFL league player data is split into a 90% training set and 10% test set. Several candidate models are then fitted, and their corresponding validation-set error computed. Note that:

- Model fitting occurred independently for each position (FW, DF, MF, GK).
- Goalkeepers are modelled only using goalkeeping data. Here, it is assumed that goalkeepers do not require the same level of attacking, passing etc. as other positions, and that goalkeeping specific skills are their most important attributes.

The results from model selection are as follows:

Model Type	FW Test MSE	MF Test MSE	DF Test MSE	GK Test MSE
Linear Regression	2.9468×10^{13}	3.381205×10^{13}	2.483974×10^{13}	N/A
Boosting	2.0763×10^{13}	2.16941×10^{13}	1.877825×10^{13}	2.821938×10^{13}

As such, although the boosting algorithm comes at the cost of less interpretability, its higher predictive performance justifies its selection.

The four boosting models used to rate players utilise the following parameters:

- An interaction depth of 1 resulting in each tree becoming a stump. This leads to a more interpretable additive model.
- A shrinkage parameter of 0.01 which is sufficiently low for predictive needs.
- The number of trees is calculated using 10-fold cross-validation error. As a large number of trees will lead to overfitting and a small number of trees will be inflexible, the number of trees that corresponds to the lowest cross-validation error is selected.

Depicted below are the plots of Bernoulli deviance as a function of the number of trees used in each of the four positional boosting models.

FW Model Bernoulli Deviance

MF Model Bernoulli Deviance
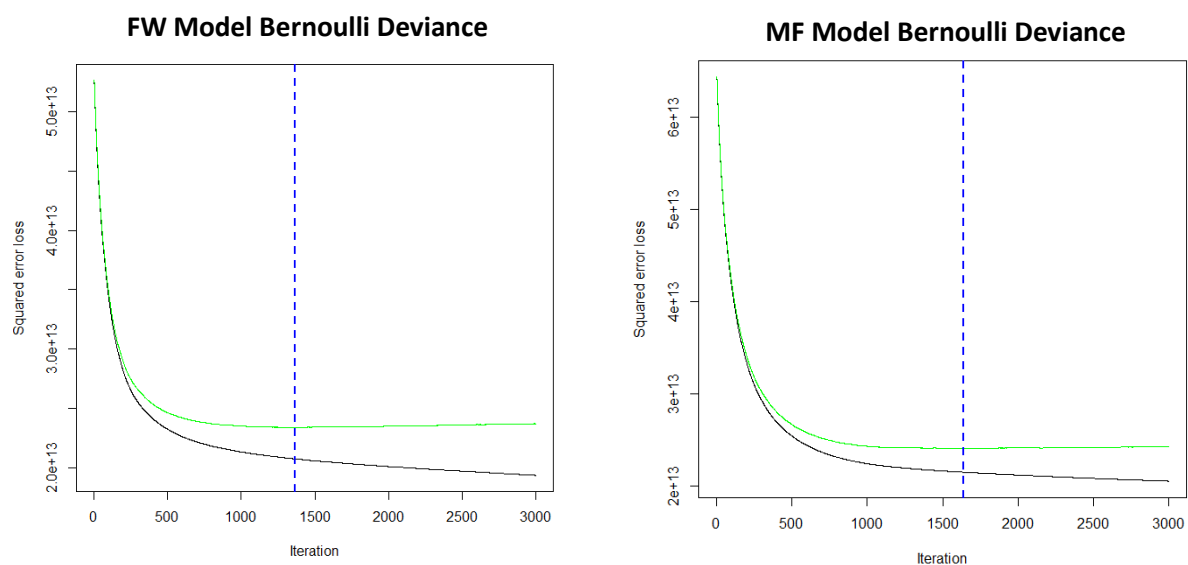
DF Model Bernoulli Deviance
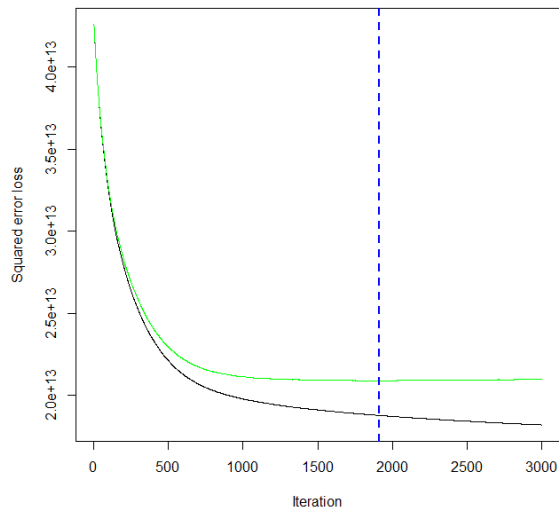
GK Model Bernoulli Deviance
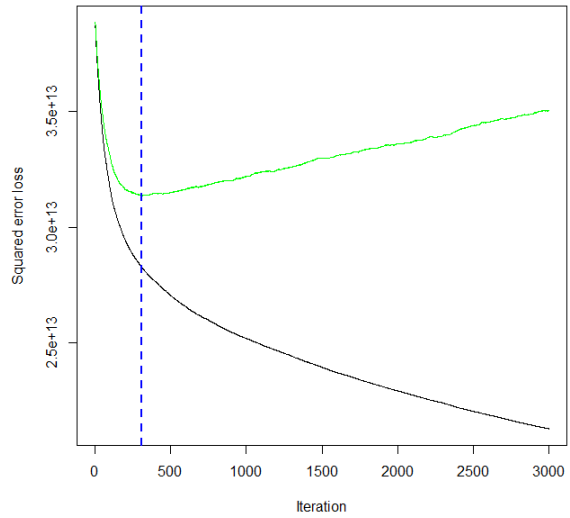
The selected models yield the following diagnostic plots:

Relationship between standardised and annualised salary
Standardised Salary
Non-RFL FW
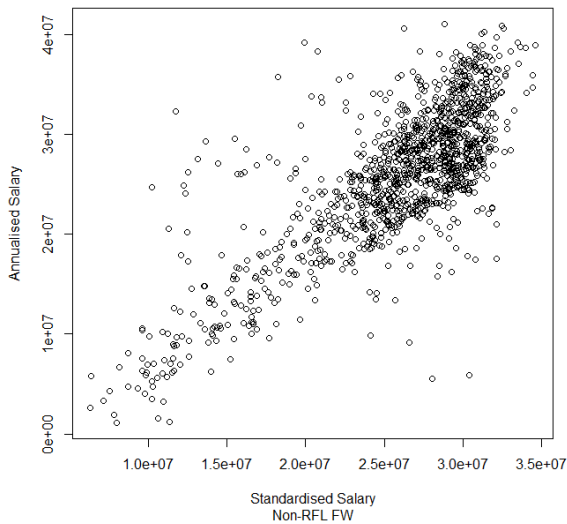
Relationship between standardised and annualised salary
Standardised Salary
Non-RFL MF

Relationship between standardised and annualised salary
Standardised Salary
Non-RFL DF
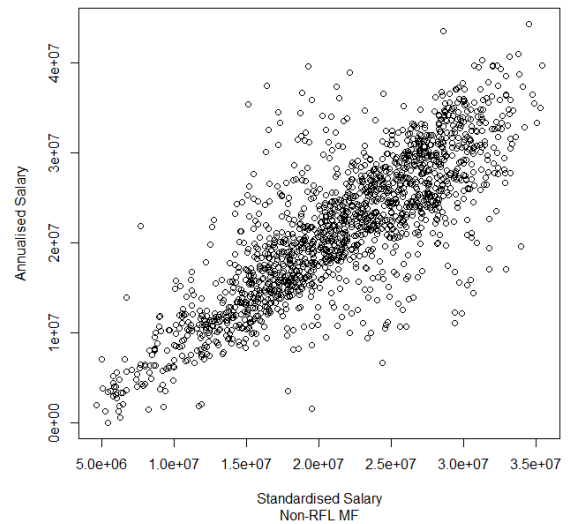
Relationship between standardised and annualised salary
Standardised Salary
Non-RFL GK
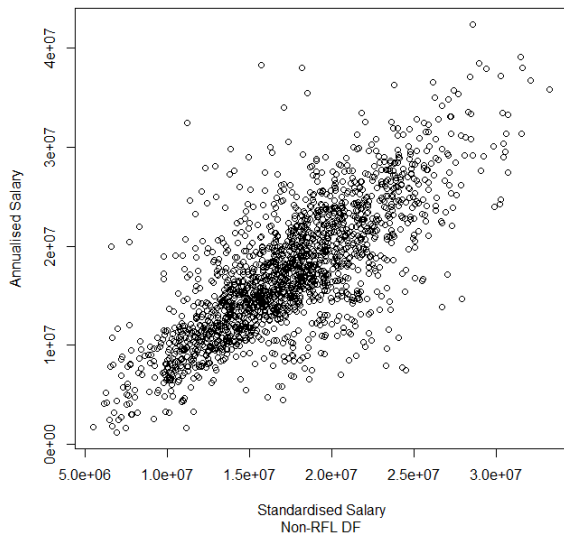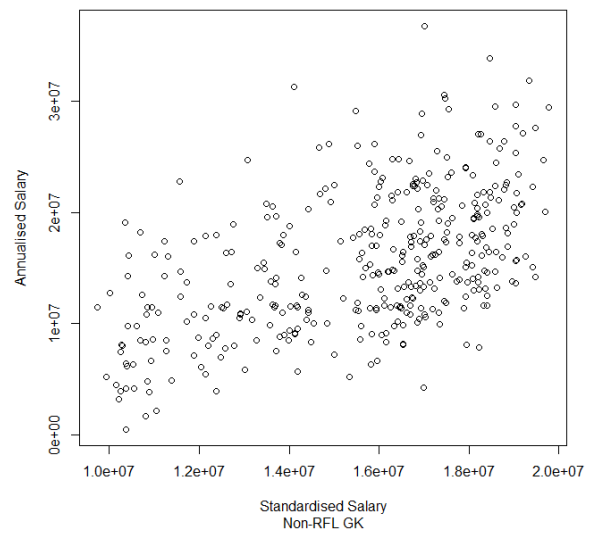
Team-rating model

Further, the team-rating model which links team position scores to match outcomes is developed using the 2021 tournament player data and tournament placings. Here, to construct the dataset that the team-rating model is to be trained on, we assume higher-ranked teams beat all lower-ranked teams in their matchups. By also obtaining the team position scores for all teams that performed in the 2021 FSA championships, a dataset is constructed as follows:

	A	B	C	D	E	F	G	H	I	J	K
1	Outcome	Rank_A	Rank_B	Name_A	Name_B	MF_Score	DF_Score	FW_Score	GK_Score	Total_Score_Dif	
2	Win	1	2	Sobianited	People's L	-1049589	189901.4	4707518	-2864296	282908.1	
3	Win	1	3	Sobianited	Nganion	-744341	-1961238	-5168088	251814.2	-1900607	
4	Win	1	4	Sobianited	Mico	-3801391	-1791967	-1180585	-27795.3	-2251127	
5	Win	1	5	Sobianited	Quewenia	-3145410	-1859832	1957770	1700609	-1309529	
6	Win	1	6	Sobianited	Southern F	4583767	-926097	9144818	-94539.8	2984162	
7	Win	1	7	Sobianited	Galamily	1986274	473163.2	3483891	-254943	1504599	
8	Win	1	8	Sobianited	Bernepam	1532347	537985.4	5256987	334883.6	1739108	
9	Win	1	9	Sobianited	Giumle Liz	304667.2	1823561	864225.4	1564855	1073292	
10	Win	1	10	Sobianited	Greri Land	2609802	-2066629	-2035688	180007.6	-156243	
11	Win	1	11	Sobianited	Xikong	2820760	3408874	334625.1	616198.1	2382180	
12	Win	1	12	Sobianited	Manlisgam	135678.1	18294.37	596017.8	3663472	497399.8	
13	Win	1	13	Sobianited	Esia	-765563	-739399	4399934	1325669	373244.3	
14	Win	1	14	Sobianited	Byasier Pt	1439024	-2026766	5735865	596334.1	883372.4	

A GBM using a Bernoulli loss function is fit to this dataset, whose parameters are selected according to the same methodology outlined in the player-rating model section.
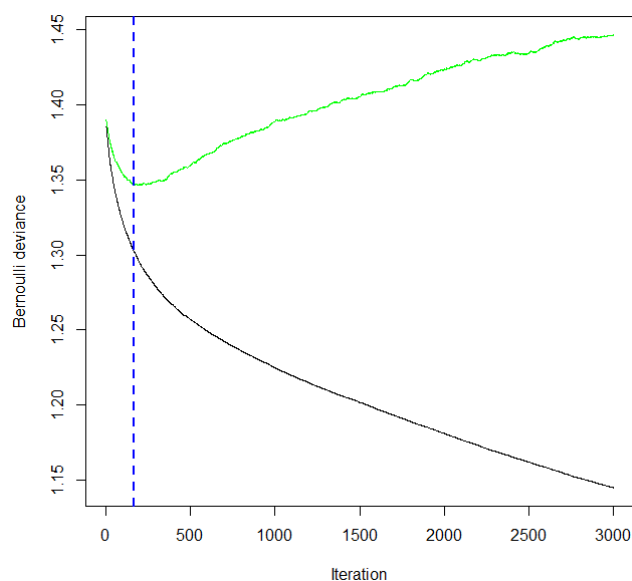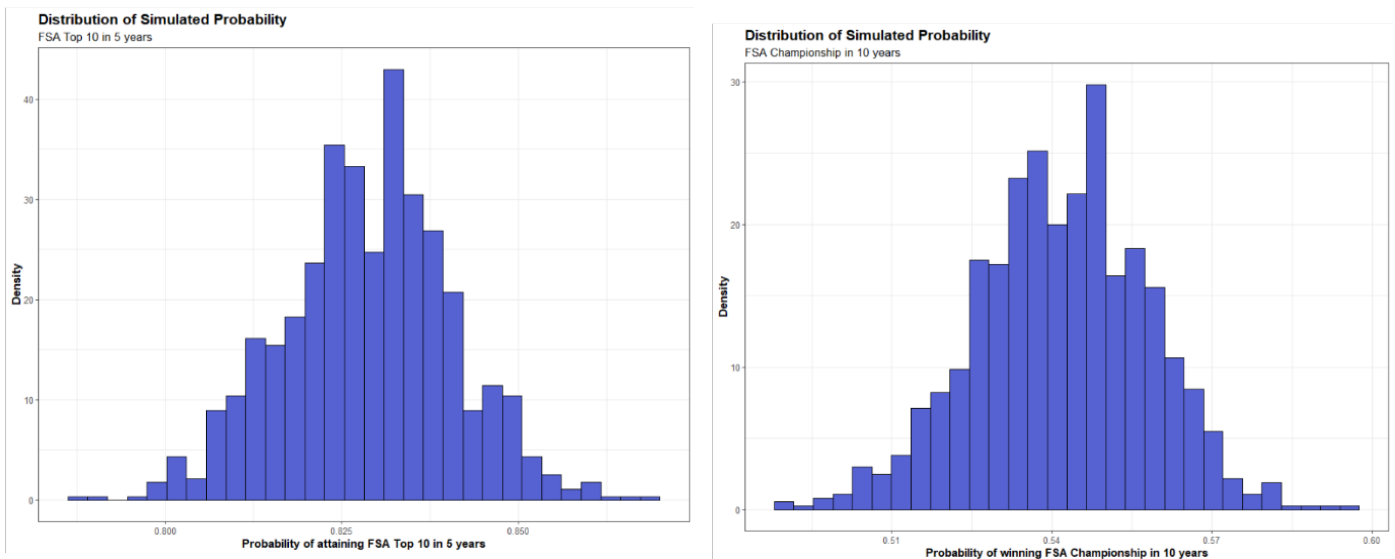
As seen in the plots above, a player selection which does not include the additional restriction of players being in the top 25% salary bracket does not generate sufficient competitiveness to comfortably satisfy the 85% and 70% benchmarks for attaining an FSA top-10 in 5 years and winning an FSA Championship respectively.

Appendix 4 − Economic impact: Revenue calculation

Tournament support

FSA tournament prize pool is estimated to be 25% of FIFA 2018 prize pool, as FSA is held yearly whereas FIFA occurs every 4 years. A 2% prize pool growth rate is derived from the increments in 2014, 2018 and 2022 FIFA prize money and assumed to be constant for simplicity.

Variable prize money

Due to the uncertainty involved in gaining placement related prize money, it is assumed that this revenue will be split between player bonuses, investments for infrastructure and sport-related activities within Rarita.

Sponsorships

Our external research provided the following 5-year sponsorship revenue for 3 of the top 10 FIFA football teams. The assumption is that they will grow at a constant 2.088%, calculated from 5-year historical data.

Year	Barcelona		Euro to DBL
2016	€	198,687,000	ð219,549,135.00
2017	€	197,513,000	ð222,399,638.00
2018	€	205,510,000	ð242,296,290.00
2019	€	195,766,000	ð218,866,388.00
2020	€	195,809,000	ð223,418,069.00
2021	€	193,286,000	ð220,964,923.43

Year	Manchester United		Euro to DBL
2016	€	171,329,000	ð189,318,545.00
2017	€	171,530,000	ð193,142,780.00
2018	€	172,982,000	ð203,945,778.00
2019	€	173,010,000	ð193,425,180.00
2020	€	182,709,000	ð208,470,969.00
2021	€	140,209,000	ð160,287,195.92

Year	Juventus		Euro to DBL
2016	€	70,000,000	ð77,350,000.00
2017	€	74,700,000	ð84,112,200.00
2018	€	86,900,000	ð102,455,100.00
2019	€	108,800,000	ð121,638,400.00
2020	€	129,600,000	ð147,873,600.00
2021	€	141,200,000	ð161,420,109.00
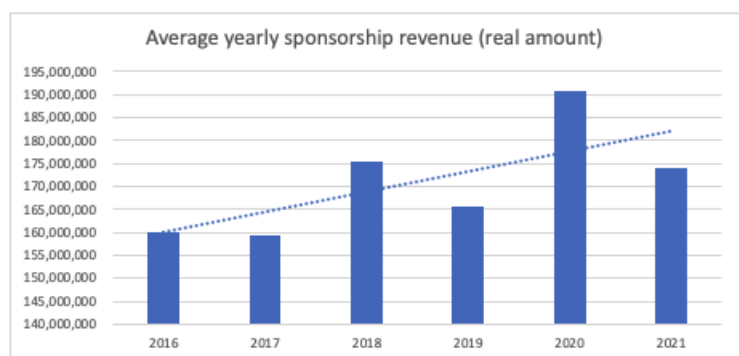
The 5-year ramp-up in sponsorship support assumes we can obtain 50% of the targeted sponsorship amount in the first year, then 65%, 80% and 90% from year 2 across to year 4 based on our expected ranking over time.

	Projected amount (Nominal)	Tournament as % of League	Haircut on sponsorship (reflecting lag before full capital gains realised)	Sponsorship Cashflows
2022	ð181,886,926.37	30%	50%	ð27,283,038.95
2023	ð189,316,405.17	30%	35%	ð36,916,699.01
2024	ð188,797,012.20	30%	20%	ð45,311,282.93
2025	ð196,484,583.62	30%	10%	ð53,050,837.58
2026	ð196,579,386.73	30%	0%	ð58,973,816.02
2027	ð205,822,677.33	30%	0%	ð61,746,803.20
2028	ð205,606,395.05	30%	0%	ð61,681,918.51
2029	ð215,121,638.60	30%	0%	ð64,536,491.58
2030	ð214,819,370.49	30%	0%	ð64,445,811.15
2031	ð219,339,682.81	30%	0%	ð65,801,904.84

Appendix 5 − Economic impact: Costs calculation

Player salary

Since only league player salary has been provided, it is assumed that the only difference driver between league and tournament player salaries is the duration of the match. Typically, a FIFA tournament requires 2-3 months of training and 1 month of match time, thus we assumed that tournament player salary is 25% of their most recent league salary, indexed to inflation.

Operating margin

To obtain the operating margin, Rarita's league revenue and expenses were projected on a 10-year horizon and scaled up by the projected population. Since league expenses already include player salaries, all Rarita Football League player salaries for 2020 were summed up and then subtracted from the total staff costs in 2020. This gave 6% operating costs excluding player salaries. Then, the ratio between total Rarita revenue and costs was calculated for the next 10 years to find corresponding operating margin for each year.

Revenue

Per CapitaTotal Revenue (ð)

Year	Rarita	Rarita Population	Total Revenue
2016	146.24	12331271	$ 1,803,325,071.04
2017	155.81	12393007	$ 1,930,954,420.67
2018	163.81	12463353	$ 2,041,621,854.93
2019	183.93	12548788	$ 2,308,098,576.84
2020	163.13	12569472	$ 2,050,457,967.36
2021	181.15	12630242.52	$ 2,288,018,953.04
2022	187.34	12692485.71	$ 2,377,861,043.22
2023	193.53	12756213.47	$ 2,468,761,017.81
2024	199.72	12821438.8	$ 2,560,749,041.99
2025	205.91	12888175.82	$ 2,653,855,835.52
2026	212.1	12956439.82	$ 2,748,112,711.40
2027	218.29	13026247.24	$ 2,843,551,615.42
2028	224.48	13097615.72	$ 2,940,205,166.81
2029	230.67	13170564.09	$ 3,038,106,700.08
2030	236.86	13245112.42	$ 3,137,290,307.98
2031	243.05	13246265.69	$ 3,219,557,861.26

Costs

Per CapitaOtherExpenses (ð)

Year	Rarita	Rarita Population	Total Expenses
2016	36.5	12331271	$ 450,091,392
2017	38.11	12393007	$ 472,297,497
2018	47.94	12463353	$ 597,493,143
2019	52.83	12548788	$ 662,952,470
2020	50.44	12569472	$ 634,004,168
2021	57.944	12630243	$ 731,846,772
2022	62.204	12692486	$ 789,523,381
2023	66.464	12756213	$ 847,828,972
2024	70.724	12821439	$ 906,783,437
2025	74.984	12888176	$ 966,406,976
2026	79.244	12956440	$ 1,026,720,117
2027	83.504	13026247	$ 1,087,743,750
2028	87.764	13097616	$ 1,149,499,146
2029	92.024	13170564	$ 1,212,007,989
2030	96.284	13245112	$ 1,275,292,404
2031	100.54	13246266	$ 1,331,832,538

Per CapitaStaffCosts (ð)

Year	Rarita	Rarita Population	Total Expenses
2016	79.34	12331271	$ 978,363,041.14
2017	76.45	12393007	$ 947,445,385.15
2018	93.8	12463353	$ 1,169,062,511.40
2019	97.78	12548788	$ 1,227,020,490.64
2020	98.25	12569472	$ 1,234,950,624.00
2021	106.87	12630243	$ 1,349,781,387.62
2022	112.78	12692486	$ 1,431,509,308.53
2023	118.7	12756213	$ 1,514,149,782.74
2024	124.61	12821439	$ 1,597,730,774.06
2025	130.53	12888176	$ 1,682,280,701.43
2026	136.44	12956440	$ 1,767,828,474.69
2027	142.36	13026247	$ 1,854,403,531.11
2028	148.27	13097616	$ 1,942,035,872.95
2029	154.19	13170564	$ 2,030,756,105.93
2030	160.1	13245112	$ 2,120,595,478.71
2031	166.02	13246266	$ 2,199,131,783.75

Operating margin calculation

Total RFL player non-GK salary 2020	$	1,163,640,000
Total Staff cost 2020	$	1,234,950,624
non-football player salary %		6%

Expenses as % of revenue

Year		Total league revenue		Other league expenses		League staff cost		League non football player %	Cost as % of revenue
2022	$	2,377,861,043	$	789,523,381	$	1,431,509,309	$	82,660,651	0.37
2023	$	2,468,761,018	$	847,828,972	$	1,514,149,783	$	87,432,618	0.38
2024	$	2,560,749,042	$	906,783,437	$	1,597,730,774	$	92,258,894	0.39
2025	$	2,653,855,836	$	966,406,976	$	1,682,280,701	$	97,141,120	0.40
2026	$	2,748,112,711	$	1,026,720,117	$	1,767,828,475	$	102,080,965	0.41
2027	$	2,843,551,615	$	1,087,743,750	$	1,854,403,531	$	107,080,130	0.42
2028	$	2,940,205,167	$	1,149,499,146	$	1,942,035,873	$	112,140,346	0.43
2029	$	3,038,106,700	$	1,212,007,989	$	2,030,756,106	$	117,263,381	0.44
2030	$	3,137,290,308	$	1,275,292,404	$	2,120,595,479	$	122,451,039	0.45
2031	$	3,219,557,861	$	1,331,832,538	$	2,199,131,784	$	126,986,016	0.45

Exchange rate & Inflation

Exchange rate projections

Year	Doubloon (ð)	Euro (€)	USD to Euro	Euro to USD	USD to DBL
2016	1.105	1	0.94	1.064	1.039
2017	1.126	1	0.923	1.083	1.039
2018	1.179	1	0.848	1.179	1.000
2019	1.118	1	0.893	1.120	0.998
2020	1.141	1	0.877	1.140	1.001
2021	1.143	1	0.846	1.182	0.967
2022	1.146	1	0.842	1.187	0.965
2023	1.141	1	0.835	1.198	0.953
2024	1.150	1	0.817	1.225	0.939
2025	1.145	1	0.806	1.241	0.923
2026	1.151	1	0.796	1.257	0.916
2027	1.147	1	0.782	1.278	0.897
2028	1.154	1	0.770	1.298	0.889
2029	1.149	1	0.759	1.318	0.872
2030	1.156	1	0.746	1.340	0.863
2031	1.152	1	0.734	1.362	0.845

Inflation Rates

Year	Annual Inflation Rate
2022	0.0235
2023	0.0196
2024	0.0194
2025	0.0194
2026	0.0184
2027	0.0256
2028	0.0221
2029	0.0249
2030	0.0246
2031	0.0248

Cost of Capital

External data on the market capitalisation and beta values of 6 football clubs were obtained to calculate the industry beta, risk-free rate and market risk premium. The WACC is estimated and used for NPV calculation based on these values.

Financial Data of Football Clubs

Company Name	Market Capitalisation (€ million)	Proportion of Total Market Capitalisation	Unlevered Beta
Juventus Football Club S.p.A	830.53	0.322	0.90
Olympique Lyonnais Groupe	112.99	0.044	0.51
Arsenal	902.79	0.350	0.42
Borussia Dortmund	459.000	0.178	0.39
Galatasaray	100.250	0.039	0.84
Fenerbahce	173.040	0.067	0.79

| WACC	Industry	Description
Industry unlevered beta	0.61	Apply a weighted average based on market capitilisation to account for the different sizes in the comparable companies. An arithmetic average would skew the weighting towards the smaller companies. This may not accurately quantify the business risk.
Risk-free rate	0.02	10-year USD treasury bill rate used as a proxy for the risk-free rate since it is liquid and its term to maturity matches the desired time horizon (assumes company is a going concern). Source: Factset
Market risk premium	0.06	Implied market risk premium in Europe on March 2021. Source: Market-Risk-Premia.com
WACC	0.06	Assume no debt in chosen structure

NPV

Year	Funding Cash injection	Tournament support	Revenue Sponsorship	Operational Expenses	Expenses Player salaries	Free cashflows	Cashflows Discount factor	Discounted cashflows
2022	₫ 995,000,000	₫ 2,618,189	₫ 27,283,039	₫ 960,335	₫ 48,912,374	₫ 975,028,519	0.94	₫ (18,845,928)
2023	₫ -	₫ 2,687,167	₫ 36,916,699	₫ 1,018,002	₫ 49,868,713	₫ (11,282,849)	0.89	₫ (10,046,928)
2024	₫ -	₫ 2,754,027	₫ 45,311,283	₫ 1,074,447	₫ 50,836,018	₫ (3,845,155)	0.84	₫ (3,230,990)
2025	₫ -	₫ 2,810,106	₫ 53,050,838	₫ 1,126,166	₫ 51,823,595	₫ 2,911,183	0.79	₫ 2,308,333
2026	₫ -	₫ 2,896,149	₫ 58,973,816	₫ 1,189,608	₫ 52,778,745	₫ 7,901,613	0.75	₫ 5,912,240
2027	₫ -	₫ 2,962,454	₫ 61,746,803	₫ 1,244,785	₫ 54,129,866	₫ 9,334,606	0.71	₫ 6,590,821
2028	₫ -	₫ 3,053,640	₫ 61,681,919	₫ 1,310,314	₫ 55,323,853	₫ 8,101,392	0.67	₫ 5,397,721
2029	₫ -	₫ 3,124,996	₫ 64,536,492	₫ 1,367,288	₫ 56,699,933	₫ 9,594,266	0.63	₫ 6,032,118
2030	₫ -	₫ 3,224,712	₫ 64,445,811	₫ 1,436,692	₫ 58,095,183	₫ 8,138,648	0.59	₫ 4,828,559
2031	₫ -	₫ 3,293,199	₫ 65,801,905	₫ 1,492,186	₫ 59,533,872	₫ 8,069,046	0.56	₫ 4,517,465

Appendix 6 – Economic impact: Investment of excess funds

For excess funds that are not set aside for reserves, these will be invested into the Vanguard Balanced Index Fund. This managed fund provides the project with a diverse and stable exposure to domestic equities, international equities, domestic fixed interest and international fixed interest securities. This relatively low-risk asset allocation is suitable given the various operational risks which are pertinent in our project.

Managed Fund Asset Allocation

- Domestic Equity — 20.02%
- International Equity — 29.75%
- Domestic Fixed Interest — 15.87%
- International Fixed Interest — 34.36%
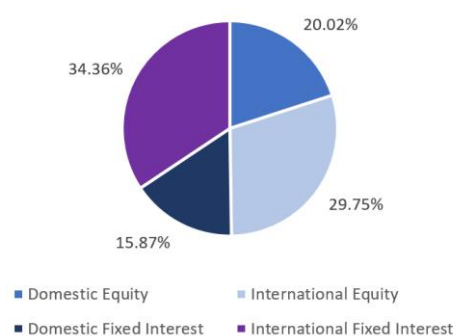
This fund selection is justified as it:

- Exhibits a low standard deviation of 7.76% compared to the Multisector Balanced category's average of 8.09%
- Has a high Sharpe ratio of 0.79 compared to the industry average of 0.67.
- Generates abnormal returns of 0.24% (alpha).
- Has a proven track record of performance with an inception date of 20th Nov 2002.
- Has no performance fee costs and a low 0.29% total cost and investment management fee.

By comparing East Rarita's GDP per capita of ∂63,534 (approximately $63,576USD) to the European countries, we can see that East Rarita sits in the top 5 of the European nation list, suggesting its economy is very developed. Whereas West Raita's GDP per capita of ∂23,863 ($23,878) ranks at around 36th in Europe.

Top 8 countries with the highest GDP per capita in Europe

Country	Last	Previous	Reference	Unit
Luxembourg	110261	113940	Dec/20	USD
Ireland	89689	87786	Dec/20	USD
Switzerland	68393	70920	Dec/20	USD
Norway	63586	64453	Dec/20	USD
Denmark	55938	57678	Dec/20	USD
Netherlands	54210	56629	Dec/20	USD
Iceland	52280	56914	Dec/20	USD
Austria	51936	55833	Dec/20	USD

Countries that ranked 32nd to 37th for GDP per capita in Europe

Turkey	28385	28199	Dec/20	USD
Greece	27287	29723	Dec/20	USD
Croatia	26465	28754	Dec/20	USD
Russia	26456	27211	Dec/20	USD
Bulgaria	22384	23192	Dec/20	USD
Belarus	19148	19283	Dec/20	USD

Source: Trading economics: GDP per capita PPP | Europe

Assuming that sport developments add equal GDP per capita values to equivalent Rarita provinces and European nations. The following table from the Department of Health Australia's report "Sports Industry Economic Analysis - Exploring the size and growth potential of the Sport Industry in Australia" suggests that sports may contribute up to 2% of GDP per capita in East Rarita.

European union satellite accounts vs KPMG study

The table below compares Australia with the top performing EU economies in terms of sports-related GDP. Note, the data for the EU study presented here was collected in 2012 using the narrow Vilnius definition.[5] All values have been converted to Australian dollars using the average 2012 exchange rate.[6]

Indicator	Germany	France	United Kingdom	Italy	Australia	Spain
Sport-related GDP	$79.89bn	$33.58bn	$27.93bn	$16.45bn	$14.38bn	$10.96bn
Sports-related GDP per capita	$995	$515	$438	$277	$584	$234
Percent of total GDP	2.3%	1.3%	1.3%	0.8%	0.8%	0.8%
Sports-related employment	1,041,882	390,455	643,728	280,957	128,443	165,946
Percent of total employment	2.7%	1.5%	2.3%	1.3%	1.5%	1.0%
Sports education services (percent of sport-related GDP)	$12.48bn (16%)	$16.71bn (50%)	$4.79bn (17%)	$6.08bn (37%)	$3.57bn (25%)	$5.20bn (47%)

The following Figure from KPMG's analysis on EU countries' sports-related GDP and employment further infers that West Rarita would have a minimum of 0.5% of its GDP per capita contributed by sport-related activities (KPMG 2022). In addition, the figure, as well as the Department of Health report also suggest an average of 1.5% of total employment within each nation comes from sport-related industries.

Figure 14: Sports contribution to the economy, Australia vs selected EU countries
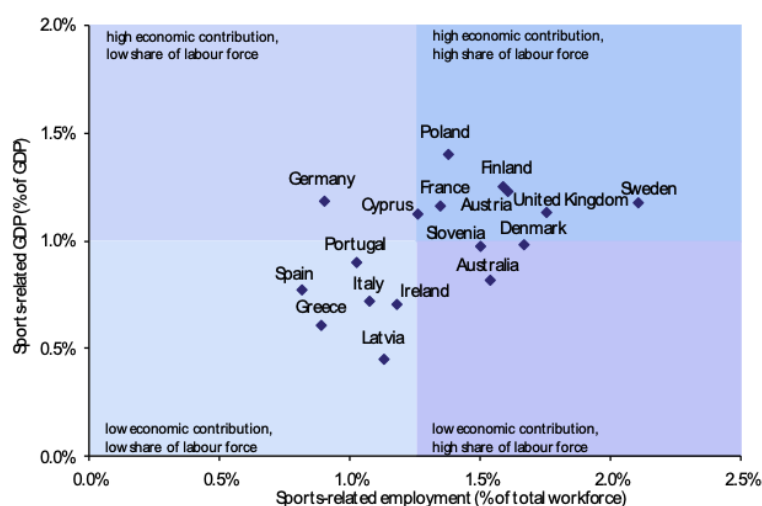
Source: KPMG Analysis; European Commission (2018). Study on the Economic Impact of Sport through Sport Satellite Accounts

Hypothetical scenario: If the Sports Industry in Australia grew to represent the same portion of total economic activity as the Sports Industry does in the United Kingdom, an additional $5.6 billion in GDP and 17,900 jobs would be supported in the Australian economy by the Sports Industry.

Source: KPMG Analysis

Fantasy Football is an online game where players choose a virtual team of Raritan Football players from the RFL. This team will gain points based on how the players real-life performance. For example, if you pick a forward and they score a goal in real-life, then you are awarded a point. Teams can then be compared against friends over the app or social media to create competitiveness and drive further interest in football.

Appendix 9 - Implementation Plan: Team Monitoring

According to our GBM, these were the most important traits per position:

```
> summary(gbmFit_MF)
                              var       rel.inf
Expected_xG           Expected_xG 57.57602882
xA                             xA 18.81548603
Tackles_Tkl           Tackles_Tkl  9.26453500
`Standard_Sh/90`     `Standard_Sh/90`  5.44264148
Int                           Int  3.87852136
Vs_Dribbles_Att     Vs_Dribbles_Att  1.00827331
`90s_avg`               `90s_avg`  0.95716028
Clr                           Clr  0.79173372
Age                           Age  0.62634581
Standard_Dist       Standard_Dist  0.39733154
`Standard_G/SoT`   `Standard_G/SoT`  0.36608028
`Standard_SoT/90`  `Standard_SoT/90`  0.30582126
`Total_Cmp%`         `Total_Cmp%`  0.20708530
Standard_FK           Standard_FK  0.17357615
`Pressures_%`         `Pressures_%`  0.10031155
Performance_PK       Performance_PK  0.05718699
Blocks_Sh               Blocks_Sh  0.03188112
```

```
> summary(gbmFit_DF)
                              var       rel.inf
Expected_xG           Expected_xG 44.7426466
xA                             xA 24.6237743
Tackles_Tkl           Tackles_Tkl  8.2546989
Int                           Int  7.0108206
`Standard_Sh/90`     `Standard_Sh/90`  5.1005462
Vs_Dribbles_Att     Vs_Dribbles_Att  3.3094697
`Standard_SoT/90`  `Standard_SoT/90`  1.3797455
`90s_avg`               `90s_avg`  0.9562584
Blocks_Sh               Blocks_Sh  0.8943452
Standard_Dist       Standard_Dist  0.7435640
Clr                           Clr  0.5836566
`Pressures_%`         `Pressures_%`  0.5611717
`Total_Cmp%`         `Total_Cmp%`  0.5574948
`Standard_G/SoT`   `Standard_G/SoT`  0.5566246
Standard_FK           Standard_FK  0.4172643
Age                           Age  0.1989603
Performance_PK       Performance_PK  0.1089584
```

```
> summary(gbmFit_GK)
                              var       rel.inf
`Performance_Save%`  `Performance_Save%` 77.1119161
Performance_CS         Performance_CS  5.1960303
Performance_Saves   Performance_Saves  2.8595094
Playing_Time_90s    Playing_Time_90s  2.8567740
Penalty_Kicks_PKsv  Penalty_Kicks_PKsv  2.7533075
Penalty_Kicks_PKA   Penalty_Kicks_PKA  2.1024572
Performance_GA90     Performance_GA90  1.6512823
D                               D  1.4692984
W                               W  0.9814112
Penalty_Kicks_PKm   Penalty_Kicks_PKm  0.9579837
`Penalty_Kicks_Save%` `Penalty_Kicks_Save%`  0.6952634
`Performance_CS%`     `Performance_CS%`  0.6727889
L                               L  0.5113556
Age                           Age  0.1806220
```

```
> summary(gbmFit_FW)
                              var       rel.inf
Expected_xG           Expected_xG 59.7364617
xA                             xA 19.9827560
Tackles_Tkl           Tackles_Tkl  5.7870264
`90s_avg`               `90s_avg`  2.6829096
Int                           Int  2.1602595
`Standard_Sh/90`     `Standard_Sh/90`  1.6423178
Clr                           Clr  1.4636578
`Pressures_%`         `Pressures_%`  1.3532472
Vs_Dribbles_Att     Vs_Dribbles_Att  1.1532596
`Standard_SoT/90`  `Standard_SoT/90`  1.0226273
Age                           Age  0.8930842
Performance_PK       Performance_PK  0.7367449
Standard_Dist       Standard_Dist  0.4539377
`Total_Cmp%`         `Total_Cmp%`  0.3038074
Blocks_Sh               Blocks_Sh  0.2929841
`Standard_G/SoT`   `Standard_G/SoT`  0.2109429
Standard_FK           Standard_FK  0.1239758
```

Then, according to external research (Hughes et al., 2011) we developed a more concise model which is included in the report:

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.

It is important to note that required levels of improvement in player metrics should vary based on skill level since it is harder for an already skilled player to improve the same amount as someone not as skilled.

Appendix 10 - Additional risks

Risk	Description	Mitigation
Unexpected economic downturn	Major changes to stock/bond markets due to economic instability.	• Ensure assets and liabilities are managed appropriately. • Ensure sufficient margins and stress testing is conducted. • Put aside reserves to absorb losses.
Inflation rate risks	Increase in inflation rate will increase operational costs.	• Investment portfolio allocation adjustments to hedge against inflation (commodities, property).
Investment risks	Low or negative returns on investments.	• Design a well-diversified portfolio across asset classes. • If investing in fixed-income securities, select a range of term to maturities. • Monitor portfolio regularly
Unexpected change in foreign currency value	Foreign currencies are devalued relative to Rarita's currency resulting in a reduction in investment returns.	• Offset currency exchange risks through investments or hedging strategies (e.g. futures, forwards, swaps etc.).
Unexpected increase in operational expenses	Unexpected loss from revenue sources/increase expense resulting in insufficient funds for operation.	• Insurance against loss • Obtain multiple sources of revenue • Conservative profit estimations when modelling
Unreliable data inputs &inaccurate models	Model misrepresents team selection and economic impact.	• Adjust model yearly to reflect new information.
Geopolitical Instability	Foreign terrorist attacks or invasion may cause revenues to dampen due to less attention in football	• Set aside reserves to absorb losses. • Continuously monitor social and political environment. • Make contingency plans to ensure the team can reactive efficiently to any changes.
Pandemic	Impact the world economy and limit football events (decreasing revenue). Players' health may also be at risk.	• Set aside sufficient reserves. • Follow health guidelines to ensure player's safety.
Natural Disasters	Destruction of football fields from events such as earthquakes or floods reduces capacity to gain revenue. May also incur costs from damages.	• Transfer risk by purchasing insurance. • Set aside sufficient reserves to absorb losses.

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