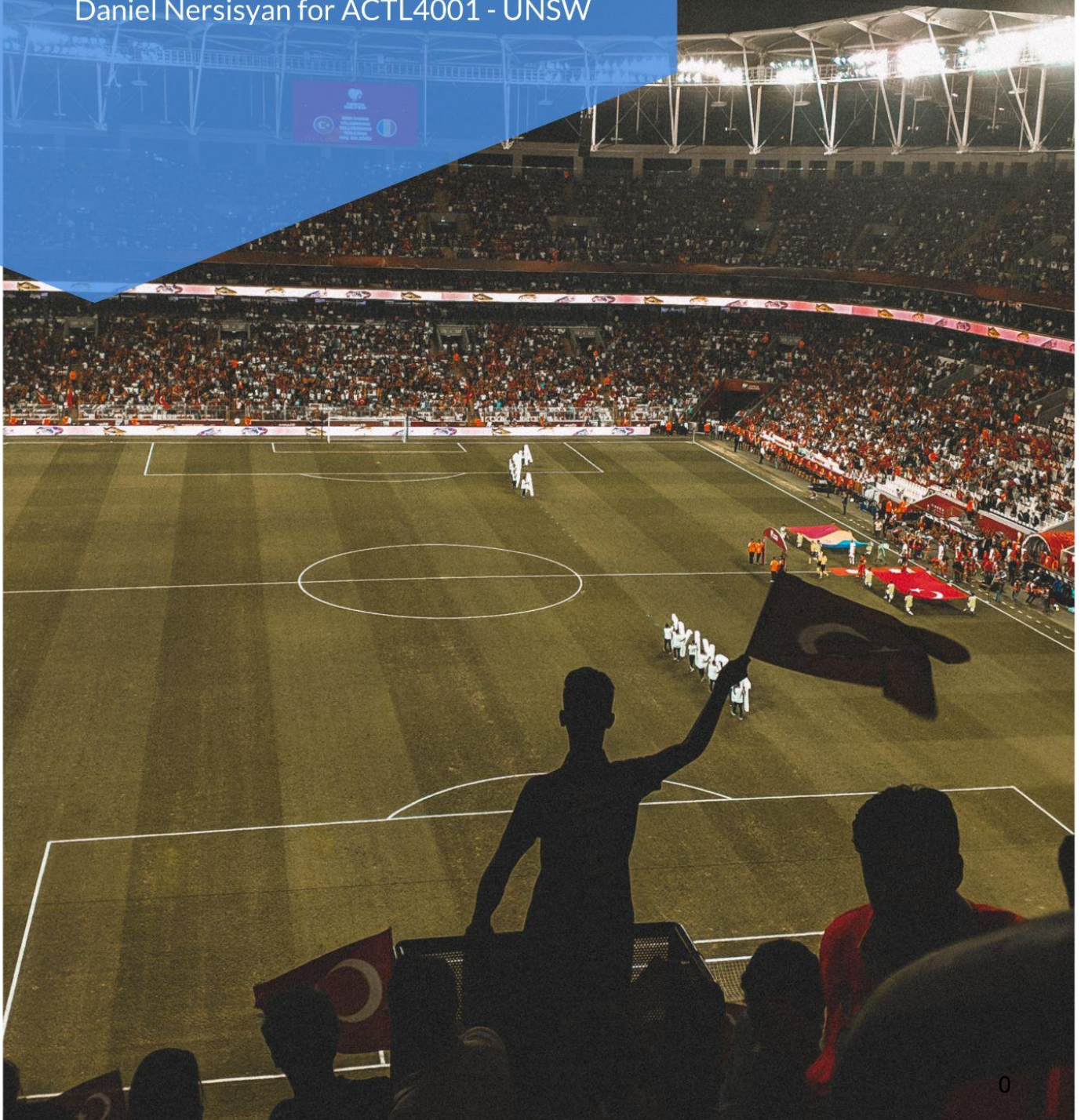


Team Jason Consulting

Constructing the Raritan National Football Team

Report prepared by Jason Liu, Samuel Bray and
Daniel Nersisyan for ACTL4001 - UNSW



Objectives of Analysis

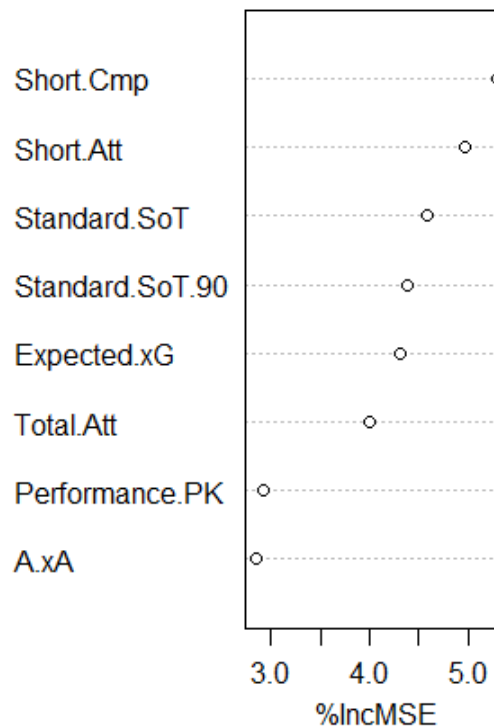
This report aims to provide detailed analysis and insight into the selection process of a national football team for Rarita and the economic and global opportunities it would bring the nation. Considering the actuarial control cycle, this report will define the issue, design a solution and propose ways to monitor results, ultimately exploring the team's selection methods, the team's probability of achieving an FSA championship, future economic prospects for the nation and a breakdown of our implementation plan. It will further outline the limitations, assumptions, risks and risk management strategies of this report along with our final recommendations.

Team Selection

Team selection was conducted through several random forest models which were split by player positions and assessed which player characteristics were most influential in determining the player's 2021 tournament team ranking. In doing so, this model was able to provide a definitive ranking on the influential player statistics that lead to a successful tournament team. From there, a criteria for team selection per individual position was created, with the following section detailing the 8 most influential positional statistics to the player team's tournament ranking, the positive or negative relationship they have which will be analysed through partial plots (Appendix E-H) and a criteria to guide the selection process for each position.

Selection Criteria

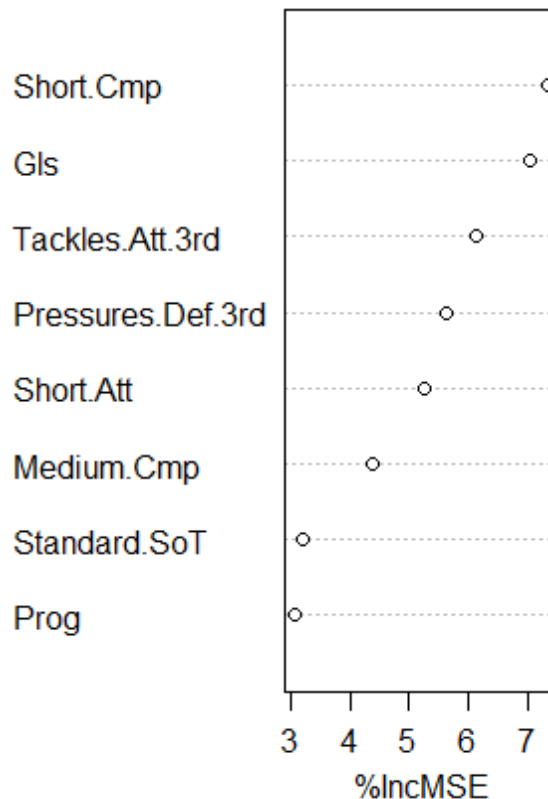
Forward - 8 most influential positional statistics by MSE according to random forest model (Appendix A):



Forward - Selection Guide

<u>Forward Statistic</u>	<u>Forward Statistic Criteria</u>
Passes completed within 5-15 yards (Short Cmp)	> 20
Passes attempted within 5-15 yards (Short Att)	> 23
Shots on Target (Standard SoT)	> 1
Shots on Target per 90 minutes (Standard SoT/90)	> 2
Expected Goals (Expected xG)	> 0.5
Passes Attempted (Total Att)	> 40
Penalty Kicks Made (Performance PK)	< 0.8
Assists minus expected assists (A-xA)	< - 0.025

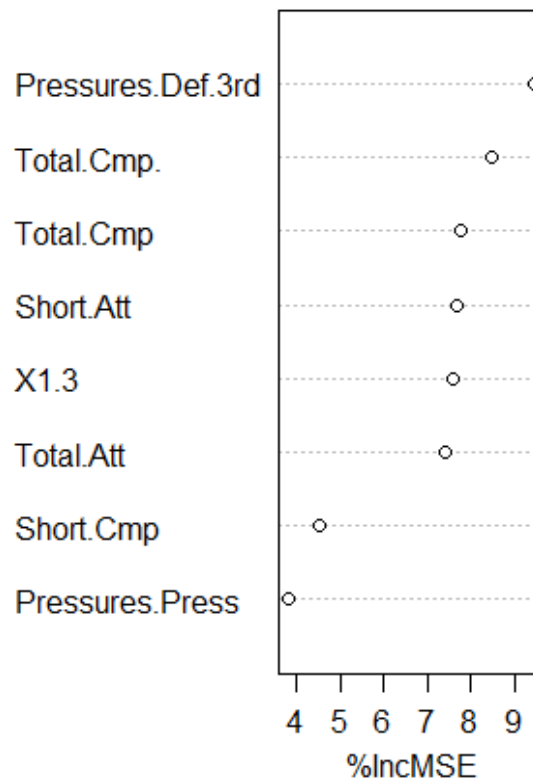
Midfielder - 8 most influential positional statistics by MSE according to random forest model (Appendix B):



Midfielder - Selection Guide

<u>Midfielder Statistic</u>	<u>Midfielder Statistic Criteria</u>
Passes completed within 5-15 yards (Short Cmp)	> 25
Goals (Gls)	> 0
Tackles in attacking 1/3 (Tackles Att 3rd)	> 2.5
Number of times applying pressure to opposing player who is receiving, carrying or releasing the ball, in the defensive 1/3 (Pressures Def 3rd)	< 5
Passes attempted within 5-15 yards (Short Att)	> 20
Passes completed within 15-30 yards (Medium Cmp)	> 25
Shots on Target (Standard Sot)	> 1
Progressive passes (Prog)	> 4

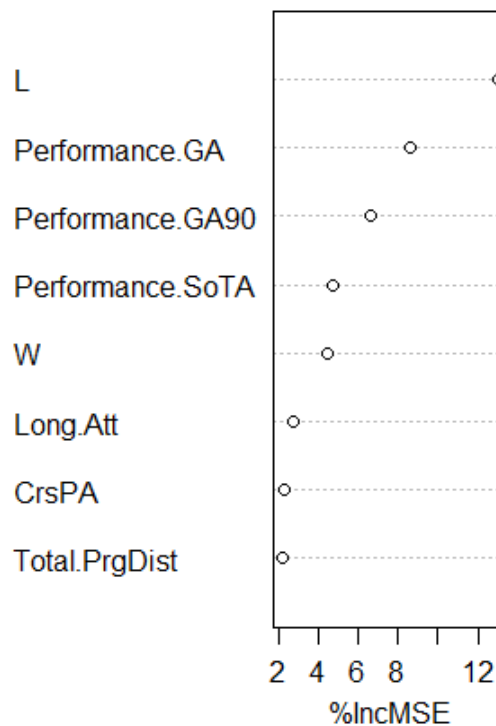
Defender - 8 most influential positional statistics by MSE according to random forest model (Appendix C):



Defender - Selection Guide

<u>Defender Statistic</u>	<u>Defender Statistic Criteria</u>
Number of times applying pressure to opposing player who is receiving, carrying or releasing the ball, in the defensive 1/3 (Pressures Def 3rd)	< 5
Pass Completion percentage (Total Cmp%)	> 85
Passes Completed (Total Cmp)	> 50
Passes attempted within 5-15 yards (Short Att)	> 30
Completed passes that enter the 1/3 of the pitch closest to the goal (1/3)	> 3
Passes Attempted (Total Att)	> 60
Passes completed within 5-15 yards (Short Cmp)	> 27
Number of times applying pressure to opposing player who is receiving, carrying or releasing the ball (Pressure Press)	< 9

Goalkeeper - 8 most influential positional statistics by MSE according to random forest model (Appendix D):



Goalkeeper - Selection Guide

<u>Goalkeeper Statistic</u>	<u>Goalkeeper Statistic Criteria</u>
Lose (L)	< 0.3
Goals Against (Performance GA)	< 0.9
Goals Against per 90 minutes (Performance GA 90)	< 0.8
Shots on Target Against (Performance SoTA)	< 2
Win (W)	> 0.8
Passes attempted >30 yards (Long Att)	< 18
Completed crosses into the 18-yard box (CrsPA)	> 0.06
Total distance, in yards, that completed passes have traveled towards the opponent's goal (Total PrgDist)	< 400

Selection of Players

Selection for each of the positions was conducted through random forest models which gave a prediction as to where each league player would have placed in the 2021 tournament given their current statistics and position. Once a placement score was provided to each league player, selection was conducted on a number of factors shown in the table below which included the player's placement score, current age, nationality and the selection guide for each position. Loaned players were only chosen when the conditions for Ratitian nationality players could not be fulfilled.

Nationality	Rarita		International Loaned Player	
Age	<24 years old	≥ 24 years old	<24 years old	≥ 24 years old
Rank	Top 200	Top 100	Top 30	Top 10
Salary	Within 1 st -3 rd Quartile	Below average	Below average	Within 1 st -3 rd Quartile

Probability for Success

The probability of success was determined through the probabilities of our constructed team coming in the top 10, top 3 and achieving first place. This was conducted through a random forest model which regressed a team's 2021 tournament placing against a position average of the top 3 most influential statistics for each position. The model predicted our team would have placed 8th in the 2021 tournament and gave the following placement probabilities:

		Probability of Achieving Placements over the Below Periods		
		1 Year	5 Year	10 Year
Placements	1st	2.8%	13.24%	24.72%
	Top 3	14.8%	55.11%	79.84%
	Top 10	70.8%	99.79%	99.9995%

From this table, it is highly probable that our team will achieve top 10 within 5 years and there is a reasonable probability that the team will achieve an FSA championship within 10 years. However, the true probability of achieving a FSA championship should be higher with our investments in younger players.

Spending Required Over the Next 10 Years

Utilising the loan system, expanded further upon in the implementation plan, Rarita is expected to generate continuous profit from 2022 to 2031. The consequent profit will allow Rarita to invest significant funds at the spot rate, within the grassroots of the game and into advertising which will increase awareness of fixtures .

Direct Team Revenues

Based upon the data provided, it is modelled that a competitive team will generate revenue that is the average of other nation's that placed in the top 10 in 2020. This will be explored in the following sections.

Economic Impact

A competitive national football team would have far reaching positive impacts economically and socially upon Rarita. In economic terms, a competitive soccer team boosts a nation's GDP through direct expenditure, indirect expenditure, employment opportunities and tax revenue. The 2015 KPMG report recognises this, concluding that professional football championships will have large impacts on economic activities and the country's GDP (KPMG Sports 2015).

In 2013, the direct impact of professional football on the Spanish economy was €3.6 billion, with 75% of that spent by football supporters and 25% spent by companies for advertising. Furthermore, €2.995 billion was spent indirectly within the economy through channels such as

hospitality, sports and construction. Combined, these two revenue streams generated 140,000 full time jobs and €2.896 billion in tax revenue for the country which contributed to 0.75% of Spain's GDP in 2013 (KPMG Sports 2015). Spain's experience could easily be mirrored through the creation of a competitive Raritan football team. It would be reasonable to model the financial returns on other competitive nations such as Dosqaly and Nganion as our model predicts a highly probable top 10 finish in the medium term. Consequently, this would lead to a 362% increase in net revenue, and a GDP increase of 0.22%. With such positive widespread economic impact and minimal to none negative impacts, it is Rarita's responsibility under the utilitarian ethical framework to create a national team to further the prosperity and livelihoods of their citizens.

Football has an indelible influence upon the socioeconomic factors within a country. Greater advertising of football within Rarita generated by a national team increases community involvement at a grassroots level. This will be particularly prudent within the country due to the substantial investment in this category, outlined in Appendix I. It is well documented that playing sport, and football specifically has positive impacts upon the health and mental wellbeing of a population. In 2017, UEFA (Union of European Football Associations) developed the 'Social Return on Investment' model, which estimated that each individual registered football player generates €3,326 in "implied benefits" (Campelli 2021)*. These factors are derived from education, integration, reduced crime rates, improved wellbeing and reduction in lifestyle diseases and thus under the care-based ethical framework, Rarita should promote the game and form a national team to promote a more healthy population.

The generation of a competitive national team will allow Rarita to 'broadcast' their nation to the world, improving tourism and generating national camaraderie. Placing their team on an international scale will grant Rarita the platform to advertise elements of their nation to the world, improving jobs and providing a further boost to their economy (Erin 2018). Based upon the GDP per capita, GNI, health care spending per capita and household saving rates provided, it is evident that Rarita experiences substantial levels of income inequality. Consequently, under the care-based ethical framework, it is imperative to promote a national identity to reduce the prevalence of civil unrest and improve the relationship between Raritans under a common cause.

*In the 25 national associations measured.

Implementation Plan

The implementation plan utilises two phases to maximise the probability of Rarita forming a competitive football in the short to long term. Within the short term, there is a greater emphasis on Rarita homegrown players under the age of 24 and loaned players within the ages of 29-33. These players were preferred under the premise that the younger players would gain valuable experience from playing together and attaining knowledge from experienced international

players, increasing the probability of becoming competitive within 5 years. Players outside of these objectives were also chosen to ensure success was not solely attained within a single generation. Ideal players within these categories were ranked based upon the random forest model previously described. Following the first 5 years, loaned players are envisioned to slowly phase out to be replaced by the younger generation Rarita players, albeit for exceptions for certain players.

Loaning players will also form a valuable tool to boost revenue and provide younger Rarita players with experience playing on an international stage and will occur within two stages. For the first 5 year period, Rarita will place all players below the 1000th ranked player, or 300th ranked goalkeeper for loan. This will ensure that teams do not become too competitive due to attaining a strong player, as adjudicated by the model, whilst allowing these players to improve and potentially become a part of the Rarita national team if they improve. Following the first 5 year period however, the loan system will shift from a revenue building model to one that fosters the development of young players, solely including players under the age of 25. The aim of this shift is to further minimise the competitiveness of opposing teams whilst providing valuable experience to younger players, ensuring the long term prosperity of the Rarita national team.

Long term competitiveness of the Rarita national team will further be safeguarded through substantial investment at the grassroots. These investments, scheduled at £50 per capita, will largely target children playing the sport through mechanisms such as upgrading local grounds, low registration fees, professional development pathways and discounted tickets to games. The goal of these initiatives is to maximise interest in the game, improve the health of future generations and improve the overall quality of future Raritan players.

Metrics of performance will be provided to a designated committee annually, reporting on factors such as revenue and expenses against expected and overall team performance. The model should continuously be updated to determine the imperative statistics to team success and undervalued players currently on the market. Team performance, albeit important, will largely be judged based upon overall improvement and future risk mitigation plans.

Assumptions

Key Modelling Assumptions

When assessing what statistics were most important to a player's position, it was assumed that the team's tournament placing was a good indicator of player performance. This assumption was made as it was the only and most suitable option to substitute as a metric for player performance.

When modelling goalkeeping performance, it was assumed that none of the shooting or defending statistics were significant for a goalkeeper. This assumption was made due as there

were a limited number of goalkeeper observations and the reduction in the number of independent variables would significantly reduce overfitting in the model.

In the prediction for team success, the position average of the top 3 most influential statistics of each position was assumed to be a good indicator of the quality of a team's forwards, defenders, midfielders and goalkeepers as there were only 24 team rankings and we did not wish to overfit the model.

Other modeling assumptions

- Missing values in data assumed to be 0
- Player past performance is a good indicator of future player performance

Economic Assumptions

- Population growth is assumed to remain at the long term trend of 0.435%
- The average spot and inflation rates over the long term is assumed to remain relatively stable (Appendix J)

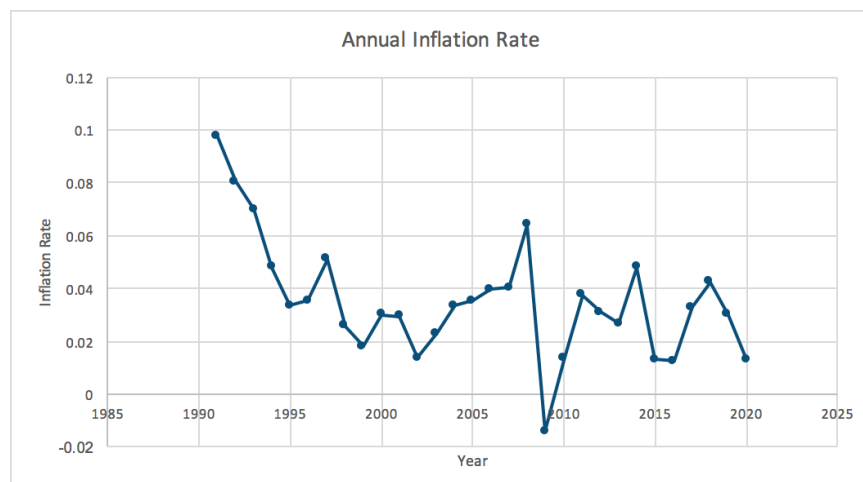
Risk and Risk Mitigation Considerations

While the implementation of a national football team is likely to be beneficial to Rarita in several aspects, there are risks to the success of the program which must be addressed below using the actuarial control cycle:

	2016	2017	2018	2019	2020
GDP	33753.7	35569.5	37971.35	37083.4	35893.45
Revenue	263.0525	285.4405	298.168	338.802	301.1405

Economic

The above table shows the clear relationship between average GDP and revenue per capita across 20 major competitors in the FSA tournament. Thus it can be assumed that a major fall in Rarita's GDP is likely to cause a decrease in revenue from football, since on average a 3% reduction in GDP led to a 10% reduction in revenue. As discussed previously with the example of Spain, a strong and prosperous football system can help improve GDP growth, however if other factors were to hinder economic performance, football revenue would also be hindered. As shown in Appendix J, inflation is predicted to slightly increase and continue its cyclical pattern shown below.



While these are not dangerous levels, a marginal increase in prices of consumer goods can impact the savings rate (which increased 0.7% in 2020), and thus an average football fan's propensity to spend money on tickets and merchandise. In order to mitigate the impact of an economic downturn, the problem must first be identified through constant monitoring of macroeconomic conditions. Then, a solution should be created through constant pricing of tickets and merchandise as well as levels of marketing to maintain demand from fans. Finally, sales and engagement should continue to be monitored to determine the success of Rarita's dynamic pricing and economic awareness. See table below for a hypothetical scenario based on past economic growth.

Probability	0.05	0.1	0.2	0.3	0.35
GDP Growth/Quarter	-2.50%	-1.00%	0.00%	1.00%	2.50%
Recommended adjustment of ticket/merchandise pricing	-5.00%	-2.50%	0.00%	2.50%	5.00%
Adjustment of Spending on Marketing	5.00%	2.50%	0.00%	0.00%	0.00%

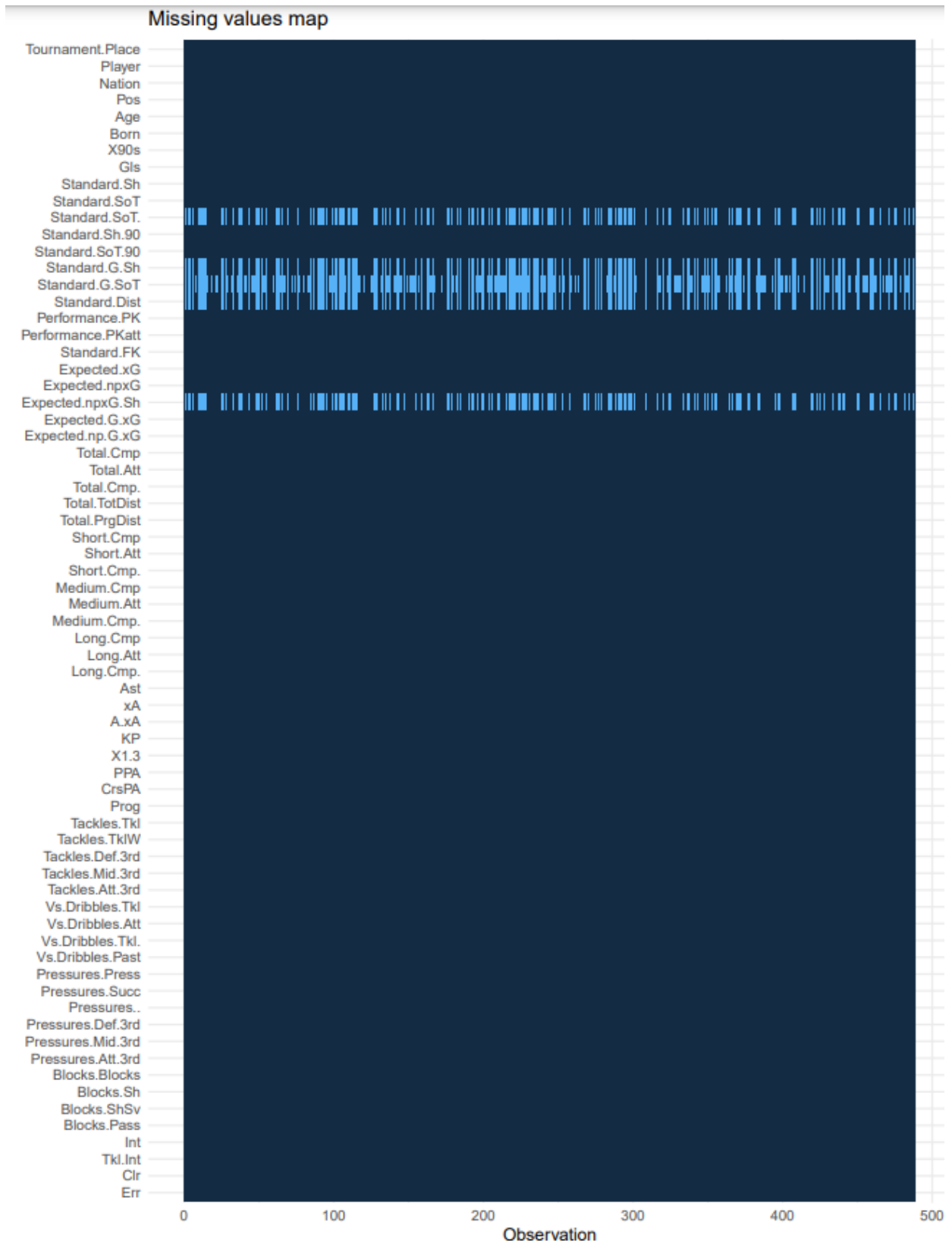
Player injury/performance

Assuming a squad of 20 players, playing 6 games (finishing in the top 10), with 6 training sessions (1 hour each), total exposure equates to around 219 hours. Research from FC Barcelona suggests an injury rate of 23.8/1000 hours of exposure (Barça Innovation Hub 2021), predicting around 5 injuries within Rarita's squad throughout the tournament. Player injury, as well as poor form represented by significant decreases in key statistics, can lead to underwhelming team performance and decreased fan engagement. The hiring of a competent medical and training staff team will help to allow players to recover after games, rehabilitate after an injury, as well as maintain their best possible level of form, thus maximising team performance and probability of success. Furthermore, bench and reserve players should receive the same treatment as star players, in order to maintain their morale and better allow them to fill in critical roles if necessary. Finally, player morale and physical health should continue to be monitored through both qualitative and quantitative metrics to determine if there are any further areas for improvement.

Data Limitations

Incompleteness: Data from the 2020 tournament was missing for passing and goalkeeping categories and their tournament ranking only included 16 teams. This limited the number of observations we could use (reduced from 2015 to 488) in our models which would have reduced their consistency and accuracy.

Missing Values: Missing values were presented in the data as null or undefined observations for a number of observations as seen below. This limitation would reduce the accuracy of our team selection models as the data is incomplete.



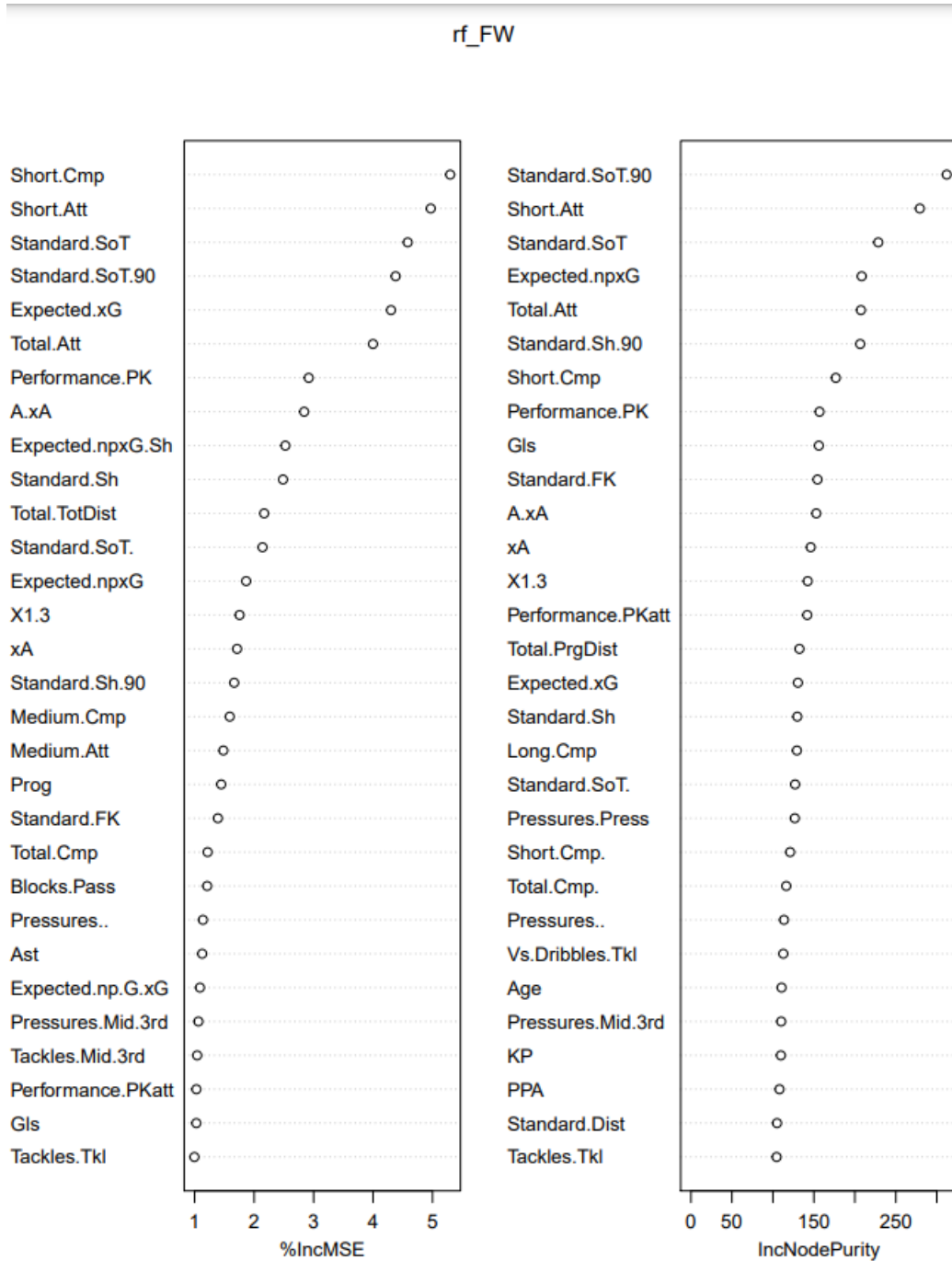
Inconsistency: Data was inconsistent with standardised values in the tournament data outside the range of 0 to 100. Data was also inconsistent in the league data as standardised league factors had values in the 1000s when the same factor in the tournament data only had a range of 0 to 100. This would have reduced the effectiveness of our team selection model and it might rank players in the league data higher than they should be rated.

Final Recommendations

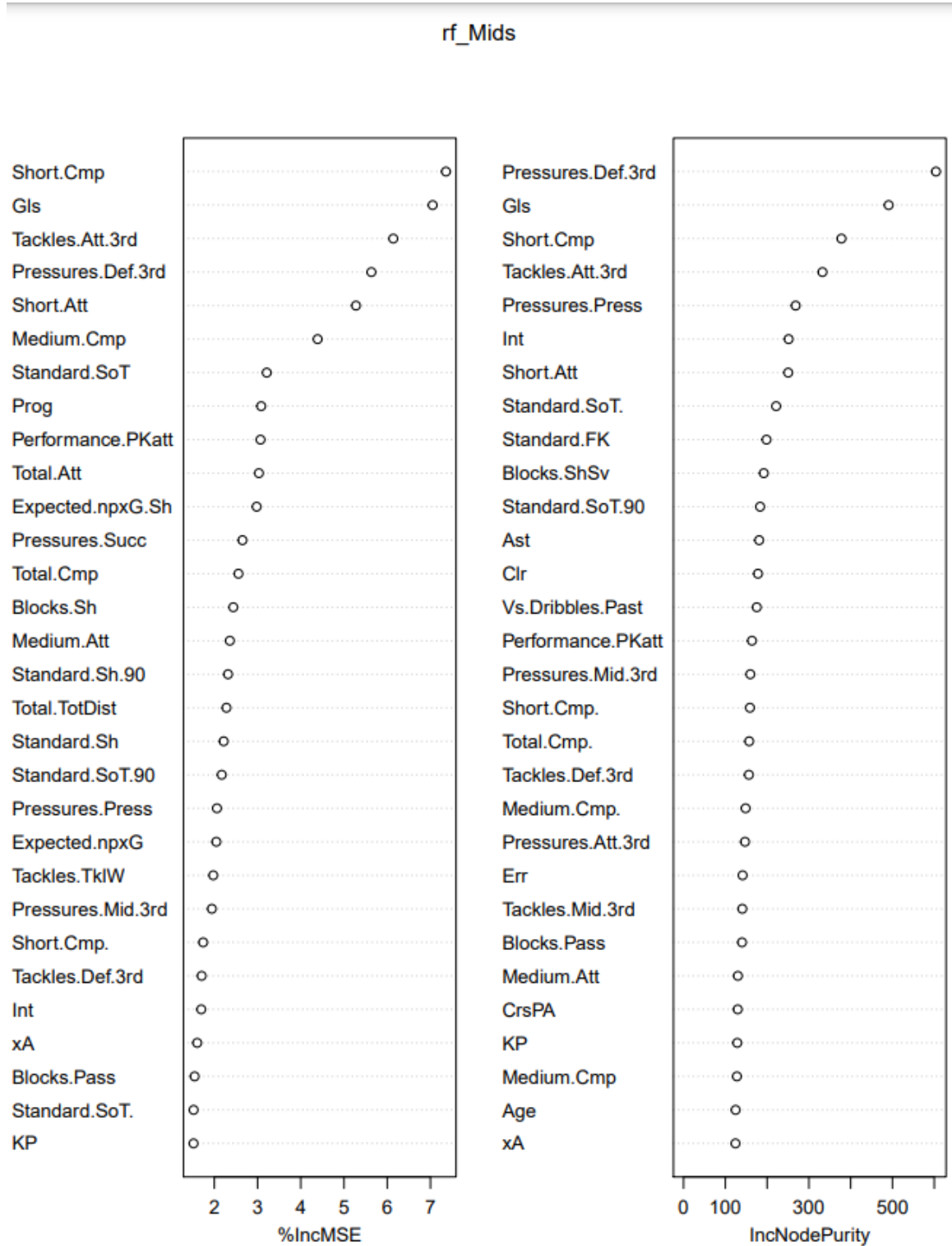
This report defines the ‘problem’ of forming a Raritian national team, designs a ‘solution’ through the implementation strategy and provides metrics to monitor the results in the medium to long term. Throughout the report, we have explored the vast economical and socioeconomic benefit to Rarita and it is our recommendation with reference to two ethical frameworks that a national team be created. However, it is advised that the risks mentioned are understood and risk mitigation strategies are in place to ensure our model is successful. Furthermore, with the data limitations previously outlined, we recommend greater research and updates to our model be conducted as more data is provided.

Appendix

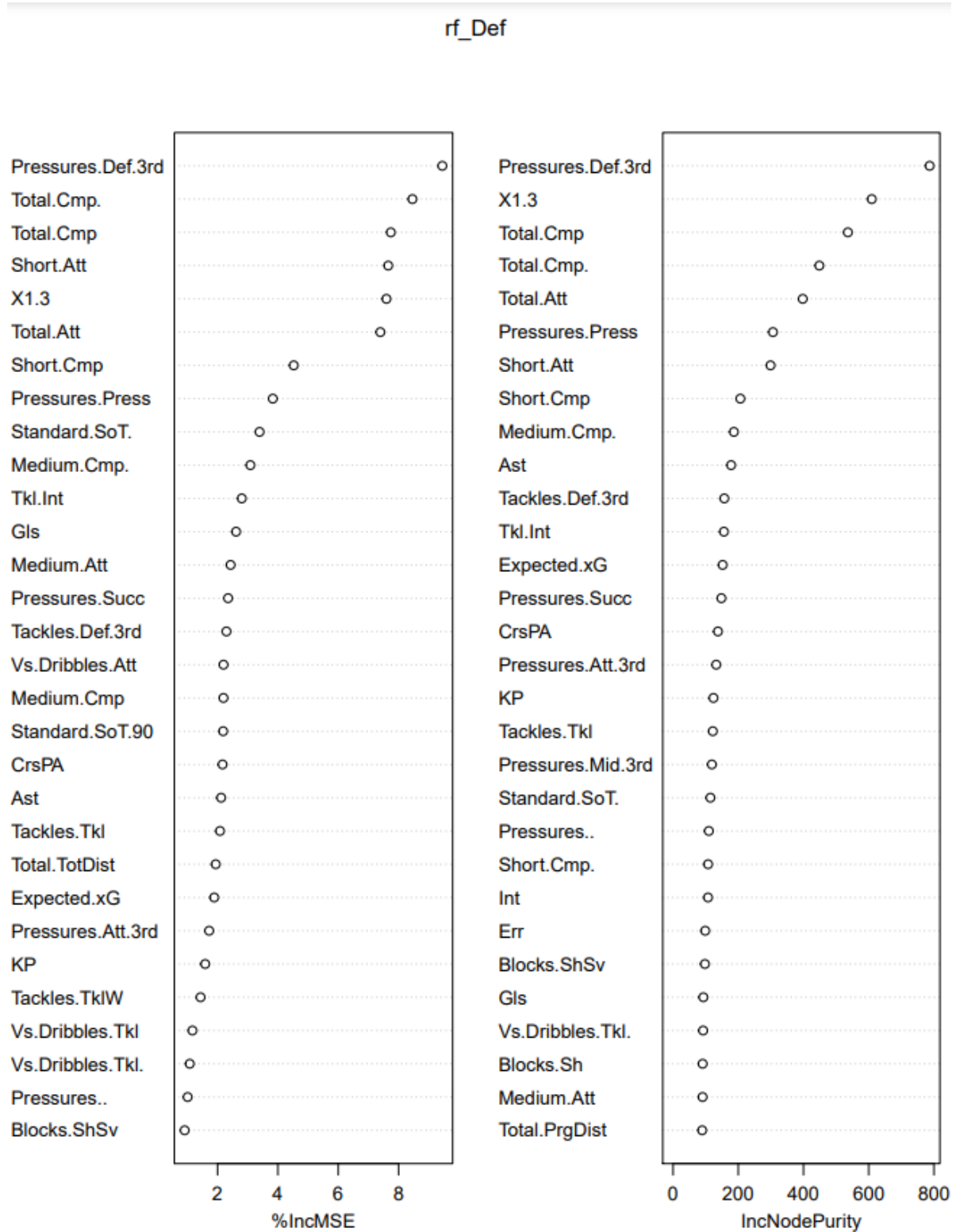
Appendix A



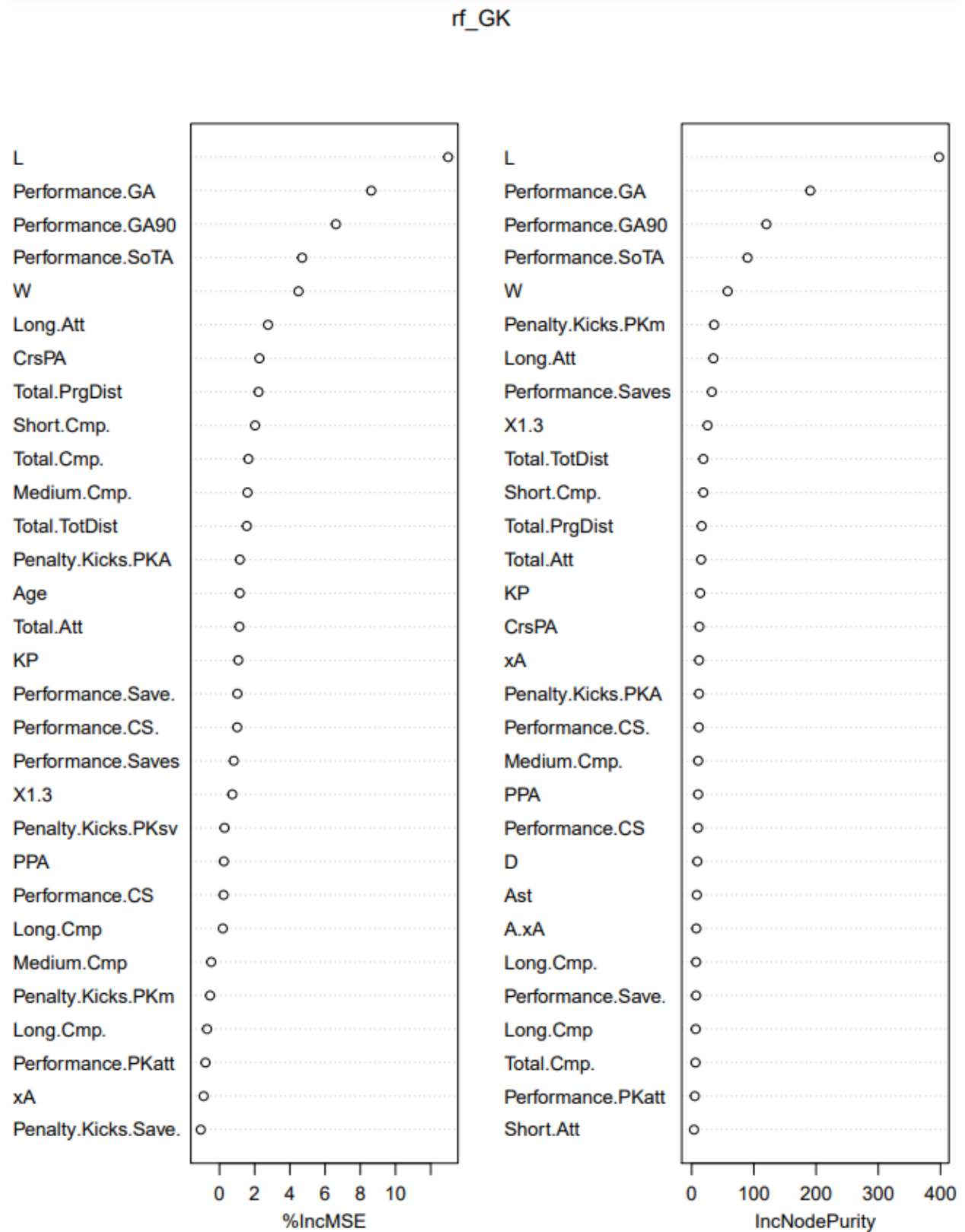
Appendix B



Appendix C

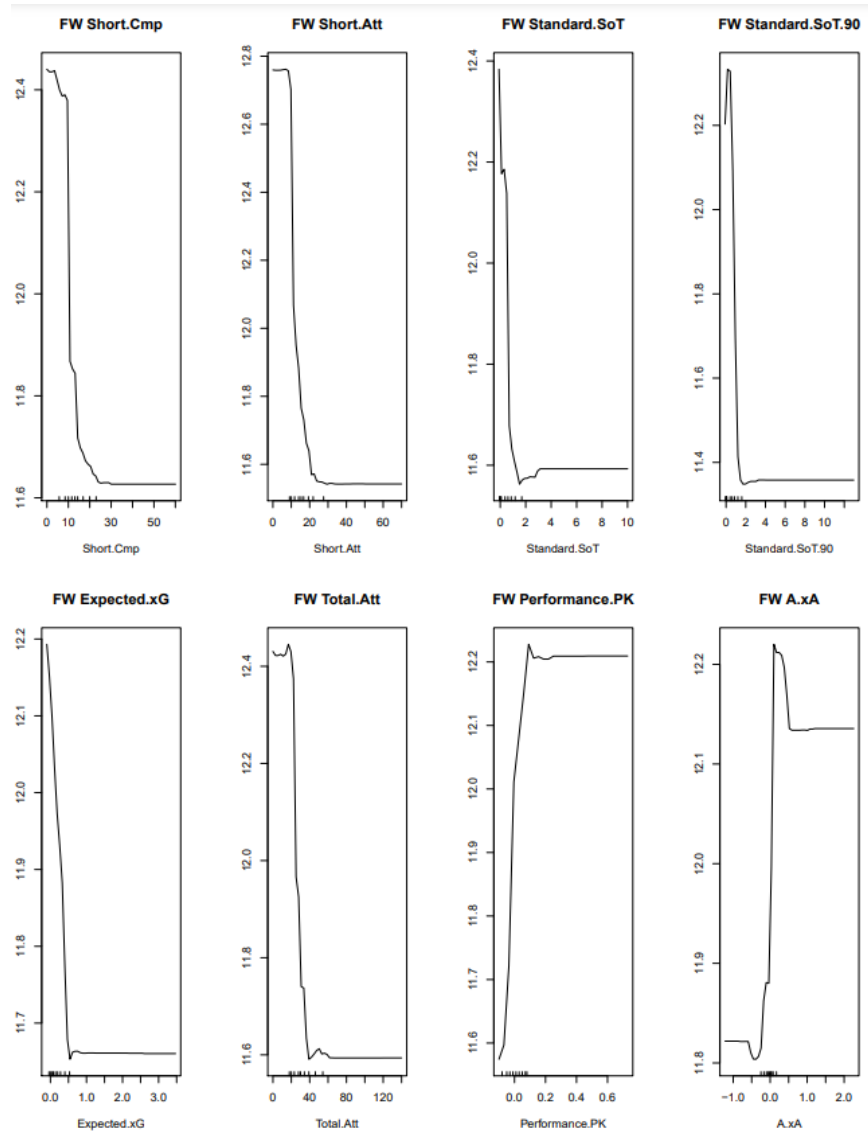


Appendix D



Appendix E

Forward - Partial Plots



*Tournament Rankings have an inverted scale where lower tournament numbers (y axis) correlate to a player in a higher ranking tournament team.

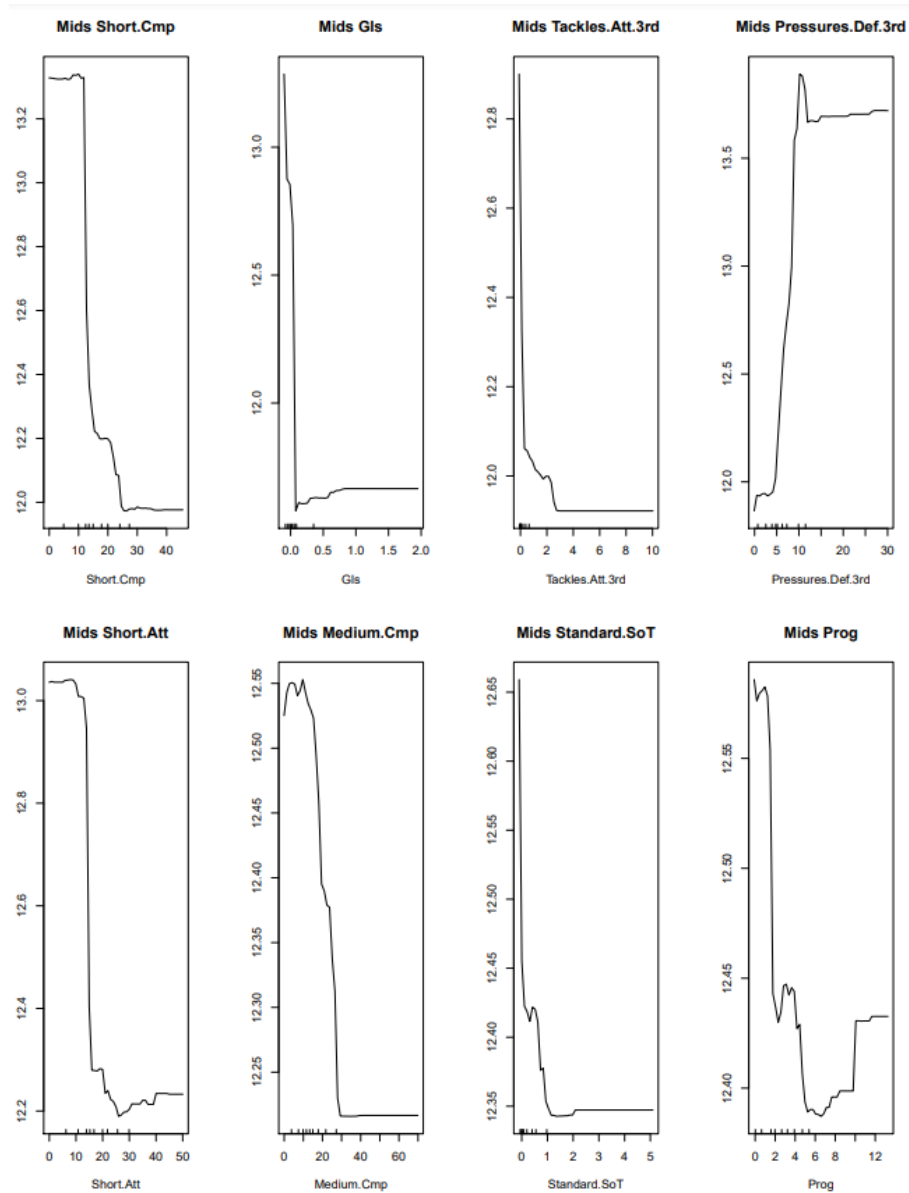
Partial Plot Analysis

Negative relationship for most of the partial plots which indicates forwards with a higher number of completed and attempted passes, shots on target, and expected goals are in a tournament team that has a high tournament standing.

Positive relationship for penalty kicks made and assists minus expected assists which indicates forwards with a higher score in these statistics have a lower tournament standing.

Appendix F

Midfielder - Partial Plots



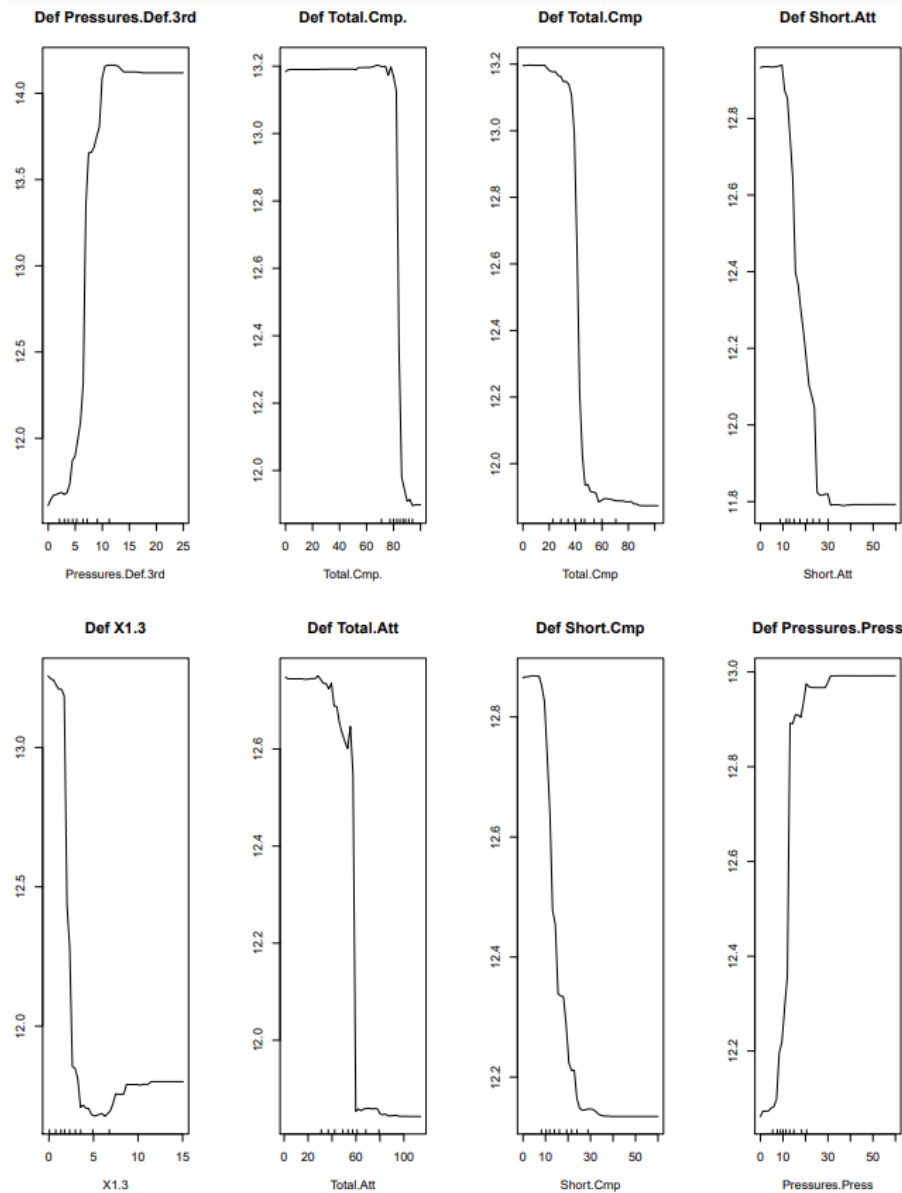
Partial Plot Analysis

Negative relationship for most of the partial plots which suggests that midfielders with a higher number of passes attempted and completed, goals scored, shots on target and progressive passes are in teams that have a strong tournament standing.

Positive relationship between the pressure applied to opposition players in the defensive third of the pitch and the midfielder team's tournament ranking. This implies that lower-ranked tournament teams have more defensive midfielders or aggressive midfielders perform better but the evidence is unsubstantial.

Appendix G

Defender - Partial Plots

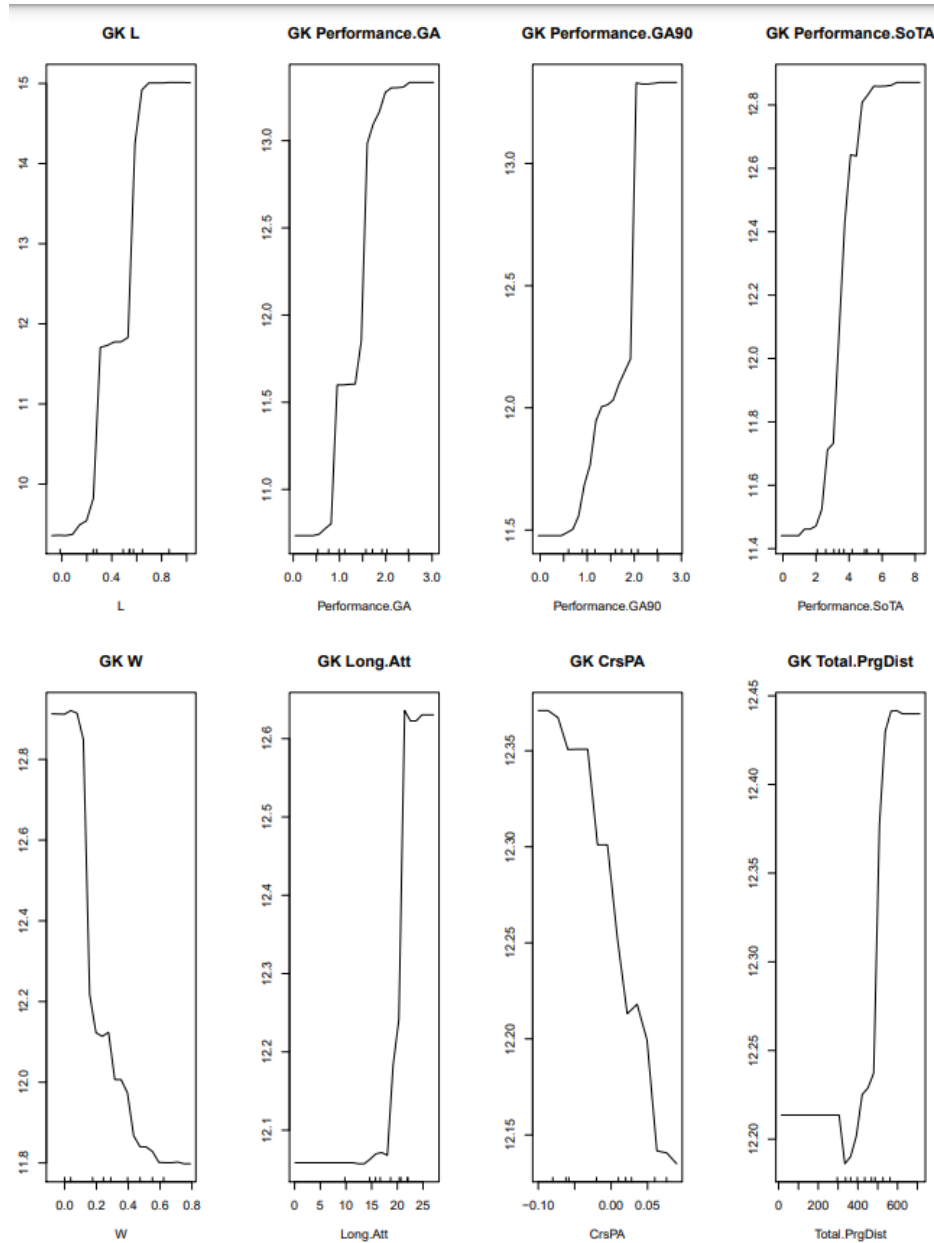


Partial Plot Analysis

Negative relationship for most of the partial plots which suggests that defenders with a higher number of passes attempted and completed are in teams that have a better tournament standing. Positive relationship between defenders that apply pressure to attackers and a lower tournament standing. A possible explanation for this is that teams that have a high tournament standing usually have possession and aren't usually on the defensive and conversely teams with a low tournament standing are generally more defensive but the evidence is unsubstantial.

Appendix H

Goalkeeper - Partial Plots



Partial Plot Analysis

Unlike the other positions, there is a positive relationship for most of the partial plots which suggest goalkeepers with a lower number of losses, goals and shorts on target against and passes attempted are in teams with higher tournament standings.

Negative relationship in wins and crosses completed which suggests goalkeepers with a higher number of wins and crosses completed are similarly in teams with higher tournament standings.

Appendix I - Spending Schedule

	2020 Values	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Opening Balance		\$ 995,000,000.00									
Per CapitaTotal Revenue (ð)	\$ 354.08	\$ 4,848,679,046.47	\$ 5,020,733,695.13	\$ 5,185,278,727.70	\$ 5,355,216,411.90	\$ 5,530,723,481.66	\$ 5,711,982,463.05	\$ 5,899,181,864.07	\$ 6,092,516,370.72	\$ 6,292,187,049.45	\$ 6,498,401,556.30
Per CapitaMatchday (ð)	\$ 52.25	\$ 685,402,617.09	\$ 709,724,026.14	\$ 732,983,886.17	\$ 757,006,044.04	\$ 781,815,482.60	\$ 807,438,003.51	\$ 833,900,253.98	\$ 861,229,754.56	\$ 889,454,927.73	\$ 918,605,127.47
Per CapitaBroadcast (ð)	\$ 127.52	\$ 1,672,762,800.54	\$ 1,732,120,537.60	\$ 1,788,887,505.85	\$ 1,847,514,903.92	\$ 1,908,063,703.85	\$ 1,970,596,875.96	\$ 2,035,179,454.29	\$ 2,101,878,604.24	\$ 2,170,763,692.44	\$ 2,241,906,358.86
Per CapitaCommercial (ð)	\$ 174.31	\$ 2,286,608,072.63	\$ 2,367,748,017.09	\$ 2,445,346,471.47	\$ 2,525,488,068.14	\$ 2,608,256,153.77	\$ 2,693,736,806.57	\$ 2,782,018,925.77	\$ 2,873,194,324.14	\$ 2,967,357,823.41	\$ 3,064,607,352.93
Per CapitaTotal Expense (ð)	\$ 301.82	\$ 3,959,213,460.12	\$ 4,099,705,555.87	\$ 4,234,065,636.52	\$ 4,372,829,114.21	\$ 4,516,140,301.91	\$ 4,664,148,242.22	\$ 4,817,006,862.30	\$ 4,974,875,133.99	\$ 5,137,917,239.11	\$ 5,306,302,740.27
Per CapitaStaffCosts (ð)	\$ 202.46	\$ 2,655,820,360.86	\$ 2,750,061,748.00	\$ 2,840,189,810.42	\$ 2,933,271,649.30	\$ 3,029,404,069.05	\$ 3,128,687,046.70	\$ 3,231,223,835.79	\$ 3,337,121,073.84	\$ 3,446,488,893.19	\$ 3,559,441,035.57
Per CapitaOtherExpenses (ð)	\$ 99.36	\$ 1,303,393,099.26	\$ 1,349,643,807.88	\$ 1,393,875,826.10	\$ 1,439,557,464.91	\$ 1,486,736,232.86	\$ 1,535,461,195.53	\$ 1,585,783,026.51	\$ 1,637,754,060.15	\$ 1,691,428,345.93	\$ 1,746,861,704.71
Operating P & L		\$ 889,465,586.35	\$ 921,028,139.26	\$ 951,213,091.18	\$ 982,387,297.69	\$ 1,014,583,179.75	\$ 1,047,834,220.83	\$ 1,082,175,001.77	\$ 1,117,641,236.73	\$ 1,154,269,810.34	\$ 1,192,098,816.03
Salaries											
Loaning Revenue		81380356.2	83903147.24	86277606.31	88719262.57	91230017.7	51124525.81	52571349.89	54059119.09	55588992.16	57162160.64
Player Salary		260788141.9	268872574.3	276481668.2	284306099.4	292351962	300625522.5	309133224.8	317881695	326877747	336128387.3
Salary P&L		-\$ 179,407,785.70	-\$ 184,969,427.06	-\$ 190,204,061.84	-\$ 195,586,836.79	-\$ 201,121,944.27	-\$ 249,500,996.68	-\$ 256,561,874.89	-\$ 263,822,575.95	-\$ 271,288,754.85	-\$ 278,966,226.61
Other Revenue											
Other Expenses											
Initial Social Media Outlay		\$ 30,000,000.00	\$ 30,000,000.00	\$ 20,000,000.00	\$ 20,000,000.00	\$ 20,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00
Investment in Grassroots		\$ 631,207,460.16	\$ 650,774,891.42	\$ 669,191,820.85	\$ 688,129,949.38	\$ 353,802,013.47	\$ 363,814,610.46	\$ 374,110,563.93	\$ 384,697,892.89	\$ 395,584,843.26	\$ 406,779,894.32
Total Other Expenses		-\$ 661,207,460.16	-\$ 680,774,891.42	-\$ 689,191,820.85	-\$ 708,129,949.38	-\$ 373,802,013.47	-\$ 373,814,610.46	-\$ 384,110,563.93	-\$ 394,697,892.89	-\$ 405,584,843.26	-\$ 416,779,894.32
Investment - Return											
1 Year			\$ 528,553,619.91								
2 Year				\$ 130,481,293.59	\$ 145,959,361.20	\$ 50,574,626.55	\$ 56,157,469.21	\$ 158,215,194.24	\$ 160,055,457.21	\$ 202,609,711.88	\$ 213,609,606.90
4 Year						\$ 142,626,924.31	\$ 159,545,741.82	\$ 55,282,279.51	\$ 61,384,791.69	\$ 172,942,388.48	\$ 174,953,949.23
6 Year								\$ 155,438,806.72	\$ 173,877,406.71	\$ 60,248,172.64	\$ 66,898,860.91
8 Year										\$ 172,350,891.98	\$ 192,795,652.35
Total Position		\$ 1,043,850,340.49	\$ 583,837,440.69	\$ 202,298,502.07	\$ 224,629,872.72	\$ 632,860,772.86	\$ 640,221,824.72	\$ 810,438,843.42	\$ 854,438,423.50	\$ 1,085,547,377.22	\$ 1,144,610,764.48
Investment - Return											
1 Year											
2 Year											
6 Year											
10 Year											
Investment Outflow											
1 Year		\$ 521,925,170.24									
2 Year		\$ 130,481,292.56	\$ 145,959,360.17	\$ 50,574,625.52	\$ 56,157,468.18	\$ 158,215,193.21	\$ 160,055,456.18	\$ 202,609,710.86	\$ 213,609,605.88	\$ 271,386,844.30	\$ 286,152,691.12
4 Year		\$ 130,481,292.56	\$ 145,959,360.17	\$ 50,574,625.52	\$ 56,157,468.18	\$ 158,215,193.21	\$ 160,055,456.18	\$ 202,609,710.86	\$ 213,609,605.88	\$ 271,386,844.30	\$ 286,152,691.12
6 Year		\$ 130,481,292.56	\$ 145,959,360.17	\$ 50,574,625.52	\$ 56,157,468.18	\$ 158,215,193.21	\$ 160,055,456.18	\$ 202,609,710.86	\$ 213,609,605.88	\$ 271,386,844.30	\$ 286,152,691.12
8 Year		\$ 130,481,292.56	\$ 145,959,360.17	\$ 50,574,625.52	\$ 56,157,468.18	\$ 158,215,193.21	\$ 160,055,456.18	\$ 202,609,710.86	\$ 213,609,605.88	\$ 271,386,844.30	\$ 286,152,691.12
Closing		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Appendix J- Inflation & Spot Rate Assumptions

Inflation	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	3.91%	4.39%	3.10%	2.83%	2.83%	2.83%	2.83%	2.83%	2.83%	2.83%	2.83%

Average 1 Year Spot Rate	1.27%
Average 2 Year Spot Rate	1.39%
Average 4 Year Spot Rate	2.25%
Average 6 Year Spot Rate	2.96%
Average 8 Year Spot Rate	3.54%

2021 inflation was measured by comparing the salary of players in 2020 against 2021, coming to a rate of 3.91%. OECD inflation forecasts were then utilised for 2022 and 2023 at 4.91% and 3.1% respectively (OECD 2019). 2024 to 2031 inflation was estimated at 2.83%, the average Raritan inflation rate over the 20 previous years. Salary levels are assumed to remain inline with inflation over the 10 year period, and not increase excessively with improved player performance.

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