

The moderating effect of knowledge on the virtual market in FIFA Ultimate Team

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Abstract. This paper examines the impact of external factors on the virtual market in Ultimate Team mode on the example of FIFA games. External factors are perceived football knowledge, perceived esports knowledge, perceived economic knowledge, satisfaction, perceived ease of use and expectation to win. Based on the results of the survey, a structural equation model was built. The results showed that the expectation of winning has the most significant impact on the time and money engagement in the FIFA Ultimate Mode virtual market.

Keywords: esports, economic, football, knowledge, FIFA, Ultimate Mode,

1 Introduction

In recent years, the dynamic development of the esports industry has been noticed. This industry has a loyal and large group of young customers. People associated with this industry can influence the customer decision-making process. Micropayments occur in games daily. For some companies, this form is the primary source of income. Football fans can combine their passion on the real and virtual football pitch. Except for treating this as entertainment, for some, it can be a form of income. FIFA (Fédération Internationale de Football Association) is the leading non-profit football association. Founded in 1904, it aims to promote football around the world. The organisation is responsible for the FIFA World Cup [1]. Since 1993, Electronic Arts has joined forces with FIFA to produce world-class video games under their brand. Currently, the partnership has been extended until December 31, 2022 [2]. FIFA can be played on computers, dedicated video game platforms, and smartphones.

In 2019, the net revenue of FIFA Ultimate Team mode (FUT), Madden NFL and NHL were \$1.38 billion, which is 28% of the total revenue share. These numbers are growing with each financial year. In 2018 they accounted for 21%, while in 2017, they accounted for 16% of total revenue [3]. For the first time, Ultimate Team mode was included in FIFA 09 for PlayStation 3 and Xbox 360 consoles in a paid add-on to the game. In FIFA 11, Ultimate Team was already offered as a free download add-on, to be already one of the many available modes in subsequent editions.

Ultimate Team mode involves creating a dream football team and competing against other players in leagues. It offers a team with one of many licensed crests, outfits, balls

or stadiums. Player cards are divided into bronze, silver, gold and specials such as Team of the Week. A player who has recorded a good performance on the real pitch can count on an upgraded version of his card, which is available in packs over the next week that can be purchased with in-game currency or by purchasing it with real money [4]. In FIFA 14, a special type of card, legends, was added to the Ultimate Team mode. This was exclusive to the Xbox 360 and Xbox One and allowed players such as Maldini, Kluivert and Gullit to play, but the cards were relatively expensive [5]. In FIFA 18, legends were renamed icons and added to the PlayStation 4 and PC versions. With subsequent editions, new types of cards were added to the mode. Real football players can count on their limited version of the card with an overall rating of 99. Professional esports players receive financial support from sponsors who purchase virtual currency to open packs to help build a solid team in the shortest possible time.

Since FIFA 17, owners of the game can face the best players in FUT Champions. Originally there were 40 matches to be played in this league over the weekend (Saturday-Sunday), but in FIFA 19, the number of matches has been reduced by ten, and one more day, Friday, has been extended. This league offers rewards depending on the balance player finish with. The available ranks are bronze, silver, gold, elite or TOP 100 to TOP 1. For professional players achieving TOP 1 was one of the options to get to the FUT Champions Cup, where the best of the best compete [6]. The purpose of this study is to see what effect esports knowledge, football knowledge, economic knowledge, perceived ease of use, and game satisfaction have on expectations of winning, which translates into the commitment of time and money that a player can spend in FIFA Ultimate Team mode.

2 Methodology

A study was conducted to test the influence of external factors such as economic or esports knowledge on the expectation of winning and this subsequently on the commitment of money and time in the virtual market of Ultimate Team mode. Structural equation modelling (SEM) is a set of statistical techniques that allow the examination of a set of relationships between independent variables, continuous, discrete and dependent variables [7]. SEM is based on many disciplines that combine measurement theory from psychology, factor analysis from psychology and statistics, path analysis from epidemiology and biology, regression modelling from statistics, and simultaneous equations from econometrics [8].

Win expectation (WE). Studies have been conducted that have used various assessments such as measuring actual bet size using discrepancy scores between expected outcomes and actual outcomes, self-reports of perceived control, and self-reports of win confidence. However, Presson and Benassi [9] found larger effect sizes in studies that measured participants' perceived ability to predict outcomes instead of participants' perceived ability to control outcomes. The current study used a self-assessment of winning perception to assess the illusion of control over the game. Accordingly, participants were instructed to answer three questions on a seven-point Likert scale assessing their winning confidence and how much confidence they had over the game.

Perceived football knowledge (PFK). The participants' football knowledge questionnaire was adapted from Brucks' three-item knowledge scale [10]. The construct consisted of three seven-point Likert type questions and asked the respondent to rate their perceived football knowledge consisting of their level of finding their way around the football world, keeping track of results, statistics, records, news or transfers.

Perceived esports knowledge (PESK). Knowing the strengths and weaknesses of a game can play a key role in a match or trade outcome. So can keeping up with the latest updates, being inspired by the game or the settings of professional players. Participants were asked to rate their esports knowledge and how they find themselves in the esports world using a measure consisting of three questions on a seven-point Likert scale.

Perceived economic knowledge (PECK). Buy cheap, sell expensive. Whether the player can use economic knowledge, analyse and predict market behaviour, and whether the player is confident in using this knowledge. Participants were asked to rate using a measure consisting of three questions on a seven-point Likert scale.

Perceived ease of use (PEOU). A seven-point Likert scale was used to assess a person's perceived ease of learning to navigate the game or their opinion on the importance of difficulty level. Perceived ease of use is part of a larger model of technology acceptance [11].

Satisfaction (SAT). The respondents' level of satisfaction was adapted from Koufaris [12] and Voss, Spangenberg, and Grohmann [13]. Participants were asked to rate their enjoyment and excitement of playing matches and their intuitiveness while trading in Ultimate Team mode using a measure consisting of three seven-point Likert type questions.

Time and money engagement (TAME). How much time can a player spend on trading, which can be done even on mobile devices outside the home, or does a player have time to play 40 matches in Weekend League, where one match is about 15 minutes. Time is money, so how much money can a player spend on virtual currency to help himself in the virtual arena, or maybe gain everything without contribution, but by investing time in the game. Respondents' answers were compiled to give a total engagement score on a seven-point Likert scale: 1 indicates the least amount of time and money, and 7 indicates the most amount of time and money.

Knowledge. Researchers have suggested that knowledge and skills reinforce the illusion of control [14]. They found that participants who perceived themselves as experts did not perform better than chance. Based on this line of empirical findings, the researchers concluded that perceived knowledge or skills do not increase the actual probability of winning but rather the expectation of winning. They advanced the hypothesis that the more knowledgeable someone perceived themselves to be about sports, the more likely they were to be confident about winning. As noted by Davis and Duncan [15], players use their sports knowledge, such as knowing the game's rules, to have an advantage over their opponents. In addition, participants spend a lot of time analysing statistical sports information from media sources. Therefore, it has been hypothesised that the more someone perceives themselves to be knowledgeable about football, the more likely they are to feel confident in winning.

Hypothesis 1: Perceived football knowledge will have a positive impact on expected Ultimate Team mode wins.

Hypothesis 2: Perceived esports knowledge will have a positive impact on expected Ultimate Team wins.

Hypothesis 3: Perceived economic knowledge will have a positive impact on the expected win rate in Ultimate Team mode.

Satisfaction. In addition to knowledge and ease of use, satisfaction can also affect win expectations. Goodman and Irwin examined the relationship between enjoyment and win expectations [16]. They showed that the more participants enjoyed a task, the more they were likely to value their choice compared to less enjoyed tasks. Thus, the pleasure induced by the game caused a cognitive distortion and participants took more risks. Given that feelings of pleasure are significantly related to cognitive biases, the more people perceive gaming as enjoyable, the more likely they are to overestimate their expected winnings.

Hypothesis 4: Satisfaction with playing Ultimate Team will have a positive effect on expected winnings.

Perceived ease of use. People feel more confident about the outcome when they are introduced to more familiar tasks [17]. For example, participants who were assigned more trials of a random task felt more confident in their outcome predictions [18]. The networked gameplay, the intuitive interface of Ultimate Team mode, and the ability to modify settings while playing indicate that the consumer needs a constant network connection and allows to understand how to use various features to compete with others. It seems likely that consumers who find playing and trading easy would be more confident of winning than those who find it not easy to use. Ease of playing and trading would induce confidence in winning.

H5: Perceived ease of use in Ultimate Team mode will have a positive impact on expected winnings.

Win expectation. Chau and Phillips conducted a study on the effect of the illusion of control on risky behaviour in a computer card game [19]. They found that people who believed they had control over the outcome bet larger amounts than those who had less control. Moore and Ohtsuka found a significant relationship between the illusion of control and gambling addiction, which problem gamblers claimed to have the ability to manipulate probabilities [20]. It has been shown that overconfidence in winnings leads to addiction or expending more amount. Besides, they can spend a lot of time analysing the game [21]. Based on the previous findings, it raises the hypothesis that the more people believe they can perform well, the more likely they are to spend extra time and money managing their teams.

H6: Winning expectations will have a positive effect on time and money commitment in Ultimate Team mode.

3 Results

The SEM model used was performed in one of the leading software tools for Partial Least Squares Structural Equation Modeling (PLS-SEM) SmartPLS version 3.2.2 [22]. Partial Least Squares (PLS) Algorithm and Bootstrap were used for the calculations. For the PLS Algorithm, a centroid weighting scheme was introduced, the number of

iterations was set to 300, and the stopping criterion was set to 10^{-7} . For Bootstrap with corrected bias and accelerated (BCa), 5000 subsamples were selected with parallel processing, two-sided distribution type, and a significance level of 0.05.

To collect the data, a survey was conducted, which was published on the social networking site Facebook on a group of tens of thousands of people specifically related to the Ultimate Team mode in the game series FIFA and current affairs in the world of football – „Rzeźnicy Kartomanii”. Each member of the group met the requirements for the study. Responses were collected via Google Form in early February 2021. There were 643 respondents to the survey. The survey topic may have suggested a male predominance in the number of responses, which was also confirmed, but the surprise may be their dominance, which was 99.1%. Less than 0.9% of the responses were women, which concludes that they prefer a different genre of games. The largest percentage of gamers (50.1%) are in the 18-24 age range. The second-largest group are those who are under 18 (39.7%). No answer was left by a representative of the older part of the population, i.e. between 45-54 years and 55-64 years. Surprise maybe two people over 65 years (0.3%), who spend their free time trading and playing matches on the virtual football pitch. The largest number of respondents has the status of student (80.9%), including primary education (38.4%) and secondary education (45.9%). Those with higher education constitute 13.8%. Most people come from cities with a population of over 250 thousand (35.9%). The second place in terms of residence is a village with 27.7%, which may suggest the development of the Internet network in Polish villages because a permanent Internet connection is required for the Ultimate Team mode.

Table 1. Reflective measurement model

Latent variable	Indicator	Convergent validity		
		Loadings	Indicator reliability	AVE
		>0.7	>0.5	>0.5
PFK	PFK1	0.901	0.812	0.726
	PFK2	0.882	0.778	
	PFK3	0.768	0.588	
PESK	PESK1	0.952	0.906	0.856
	PESK2	0.944	0.891	
	PESK3	0.877	0.770	
PECK	PECK1	0.778	0.607	0.777
	PECK2	0.926	0.857	
	PECK3	0.932	0.869	
	PEOU1	0.666	0.444	

PEOU	PEOU2	0.780	0.608	0.584
	PEOU3	0.753	0.568	
	PEOU4	0.848	0.717	

In table 1, there are four constructs with reflective variables. Checking the loadings and reliability coefficient for the variables, it was detected that the variable PEOU1 has values below the required ones but that the deficiencies are small enough it was included. All other loadings for the variables meet the conditions, which makes them significant. Additionally, the reliability coefficient value and the mean explained for the constructs were checked. These three factors confirm the relevance of the reflective variable.

Table 2. Internal consistency reliability

Latent variable	Composite reliability ρ_c	Reliability ρ_A	Cronbach's Alpha
	>0.7	>0.7	0.7 - 0.9
PFK	0.888	0.843	0.812
PESK	0.947	0.925	0.915
PECK	0.912	0.894	0.856
PEOU	0.848	0.804	0.775

The internal consistency of the reflective variable was then checked. The results in Table 2 allow for further verification of PFK, PESK, PECK and PEOU. In all constructs, composite reliability and index reliability exceed the required threshold >0.7. For Cronbach's Alpha, only PEK goes beyond the limits of 0.7 - 0.9, having a value of 0.915.

Table 3. HTMT values

Construct	PESK	PECK	PFK	PEOU
PESK				
PECK	0.251 [0.165;0.335]			
PFK	0.197 [0.109;0.288]	0.220 [0.124;0.314]		
PEOU	0.102 [0.044;0.191]	0.057 [0.049;0.132]	0.048 [0.042;0.132]	

The next step was to check the Heterotrait-Monotrait Ratio (HTMT) values. All constructs in Table 3 are significantly different from each other. The values in brackets represent the lower limit of 2.5% and the upper limit of 97.5% confidence interval.

Table 4. Formative indicator weights and significance testing results

Formative constructs	Formative indicators	Outer weights	Outer Loadings	BCa [2.5;97.5]%
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WE	WE1	0.993	0.997	[0.946;1.004]
	WE3	0.074	0.129	[-0.176;0.254]
SAT	SAT1	0.922	0.677	[0.386;1.180]
	SAT2	0.821	0.458	[0.681;0.915]
TAME	TAME1	0.525	0.701	[-0.048;0.802]
	TAME2	-0.176	0.059	[-0.570;0.339]
	TAME3	0.629	0.769	[0.036;0.879]
	TAME4	0.353	0.450	[-0.160;0.690]

Initially, all constructs had reflective variables. By conducting the study, the variables for Win Expectation, Satisfaction and Time/Money Engagement were changed to formative variables for better performance. Not all variables were significant; therefore, WE2 and SAT3 were removed.

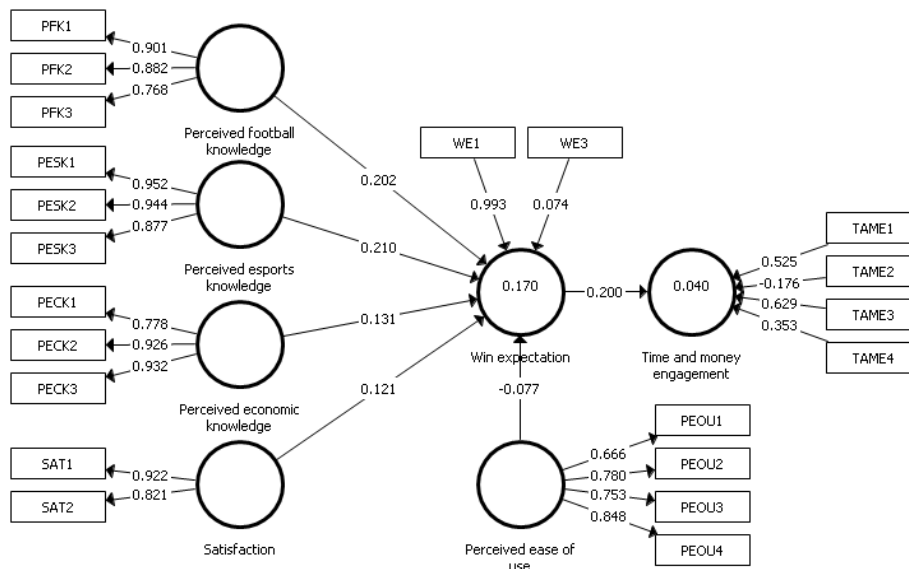


Fig. 1. The model with weights and loads for paths

After actions such as changing the variable from reflective to formative and removing insignificant variables, the final version of the model is shown with the values made in SmartPLS 3 using the PLS Algorithm in Figure 1. The paths PFK→WE, WE→TAME, PESK→WE have similar relationships around 0.200; however, the strongest relationship (0.21) has Perceived esports knowledge on win expectation. Less significant are

PECK→WE and SAT→WE which have 0.131 and 0.121 path coefficients. The PEOU→WE path is the only one where the hypothesis was not confirmed. The rest of the hypotheses were confirmed, making them influential constructs.

Table 5. Path coefficients of the structural model and significance testing results

Path	Path coefficient	BCa [2.5;97.5]%	T-statistics	p-value	Hypothesis supported
WE→TAME	0.200	[0.103;0.294]	2.862	0.004	Yes
PESK→WE	0.208	[0.129;0.285]	5.214	0.000	Yes
PECK→WE	0.134	[0.033;0.227]	2.556	0.011	Yes
PFK→WE	0.204	[0.130;0.227]	5.373	0.000	Yes
PEOU→WE	-0.077	[-0.159;0.094]	1.346	0.178	No
SAT→WE	0.125	[0.054;0.210]	3.066	0.002	Yes

4 Discussion

During the analysis phase, it became apparent that not all of the formative variables significantly affect the model. Players claim that trading in Ultimate Team mode is not intuitive and believe that they do not have full control over the match's outcome. Therefore, the variables SAT3 and WE2 have been removed. The variables WE3 and TAME2 had a p-value above 0.05 but remained in the model. In terms of WE3, respondents believe that they have more confidence by playing a highly rated squad during a match. The rating of a player's card is not based on the player's skills alone but also on nationality reputation, which may overstate the value on the virtual market [23]. Also, underrated cards may perform better on the virtual pitch due to the footballer's posture matching the current game engine, so it was decided not to remove the variable WE3. The first variable of win expectation, WE1, is significant. Players believe they are more skilled compared to the average player. The path coefficient of win expectation on time and money engagement has a significant effect. Hypothesis H6 was confirmed. The TAME2 variable stayed in the model because it confirmed that players mostly spend 1 to 2 hours per day trading in Ultimate Team mode, which could be related to the SAT3 variable removed, which stated that players are not intuitive when trading. TAME1, TAME3 and TAME4 have values that define them as significant. Players spend 2-3 hours a day playing matches in Ultimate Team mode. In doing so, they visit the FIFA Companion App mobile app or the browser version, the FUT Web App, up to 7 times a day. More than half of the users have not spent money on the virtual currency - FIFA Points.

The other satisfaction variables, SAT1 and SAT2, have an effect on win expectation. This means that playing Ultimate Team is fun and exciting. The path coefficient between satisfaction and win expectation has an appropriate value, so hypothesis H4 was confirmed.

All three types of knowledge have a positive impact on win expectations. Perceived esports knowledge has the most significant impact. Knowledge, confidence to use and ability to understand esports knowledge compared to the average fan has a significant impact. The same is true for football knowledge. Economic knowledge used in computer games and the ability and confidence to use economic knowledge also has a positive impact. Hypotheses H1, H2, H3 were confirmed.

The only not supported hypothesis is the H5 hypothesis. It appears that perceived ease of use in Ultimate Team mode does not have a positive effect on win expectation. This is related to the fact that the most common response on the Likert scale for the PEOU variables was 4. The survey mostly involved young people, this threshold for entry into the game may have been undemanding for them.

This study has some limitations. Despite the availability of female players in FIFA, only six women out of 643 responses spoke in the survey causes a lack of gender diversity. Likewise, the result of nearly 40% of those under the age of 18 may have influenced the outcome of the survey. For the younger respondents, the latest instalments of the FIFA series may have been the first games they have come across, having no comparison with older instalments and not having the opportunity to follow the series' development. Younger players may also have an advantage in terms of usage, not having the habits of the older series. Likewise, the trading aspect may have been overlooked by them wanting to enjoy the game by playing matches. When it comes to micropayments, they may be limited due to the lack of their income.

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