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ELECTRONIC SPORTS AND TRADITIONAL SPORTS: A COMPARATIVE ANALYSIS

Master's Thesis
Economics Department
04 2020

Unit Economics			
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Title ELECTRONIC SPORTS AND TRADITIONAL SPORTS: A COMPARATIVE ANALYSIS			
Subject Economics	Type of the degree Master's degree	Time of publication 25.05.2020	Number of pages 63
Abstract			
<p>This study studies the relationship between electronic sports and traditional sports in terms of economic characteristics. In recent years, electronic sports or eSports are gradually viewed as a nascent industry. The exponential growth of electronic sports has led to several researches analysing its relation to traditional sports. In this thesis, their relationship is reviewed under economic terms. In the first chapter, industry background and history of eSports is provided. Next, the growth rate is presented in terms of revenue, audience base, prize pool, and consumer awareness. The three future scenarios of eSports are then introduced. Electronic sports are predicted to take one of the three forms: “as a counterculture or alternative to modern sport, as part of the hegemony of sport or as the future hegemonic sport”. The feasibility of each scenario is then evaluated, and among the three, the second scenario – as part of the hegemony of sport is considered the most plausible option.</p> <p>The second part of this thesis deals with previous literature review in the field of traditional sport. By applying the same standards and theoretical approaches, electronic sports are put under the same examination. The purpose of this chapter is to provide the structure of electronic sport by segments and types of services/ goods that eSports offer to consumers. Prior research in economics analysis on sport and recreation have classified traditional sport as a commodity. Electronic sport, in the same manner, can also be viewed as a commodity. In chapter three, economic characteristics of traditional sports and eSports are compared. One important finding that can be found in this part is the socio-economic factors that affect consumer demand for eSports. On analysing the determinants of demand for eSports, age, gender, income, employment status are factors with the most influential impact. Time, on the other hand, is regarded as a constraint.</p> <p>In the last part of the thesis, by imposing the two-stage model used by sports economists, the impact of determinants of demand on eSport participation and participation frequency are examined. To gather the data, an online survey is created, and the data is analysed by using SPSS software (version 25.0). The result resemblances those of traditional sports in prior studies, marking the similarities</p>			

between the two. One novel finding is the distinction between factors affecting demand for gaming and for eSports. Such a result rules out the inherent stigma of eSports being interchangeable to gaming. In fact, the result strengthens previous prediction of electronic sports as part of the hegemony of sport. The thesis ends with a summary of findings, limitations of this research and the call for further research.

Keywords

Electronic sports, traditional sports, determinants of demand, socio-economic effect

Additional information

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1 INTRODUCTION

1.1 Description of electronic sports

eSports or electronic sports are, as directly quoted from dictionary: “competitive tournaments of video games, especially among professional gamers”. There are currently five major genres within eSports: multiplayer online battle area (MOBA), fighting, first person shooter (FPS), sporting, and real time strategy (RTS) with MOBA being considered the most popular genre. Due to the frequency of appearance, a list of games that have or had gained a lot of recognition from professional players and game enthusiasts will be provided. The list includes some of the most famous competitive games in eSports, which will be mentioned frequently in upcoming sections. Top of the list is MOBA with half of eSports games belong to this category. Within this genre, League of Legends by Riot Entertainment, Mobile Legends by Moonton and Dota 2 by Valve Corporation are well-known representatives. On behalf of the other genres, Fortnite (FPS) by Epic Games and FIFA (Sporting) by Electronic Arts are also very popular names.

For a long time, there has been a controversial dichotomy between traditional sports and eSports. Traditionally, sport is defined as a physical activity where individuals or teams compete against each other. eSports (electronic sports) falls into a special categorize where competitive factors are recognized, but the lack of physique aspects are preventing it from being recognized as “true sport”. For decades, eSports has been viewed as an “underground culture” and is forced to face obstacles similar to that of chess have to endure in the past. However, chess has now been recognized as a sport by International Olympic Committee (1999) and gradually being accepted by sport fans all over the world. eSports, on the other hand, is still struggling to achieve the same position. Until recent days, the status of eSports is still unclear due to its low social recognition and bad reputation of being a “hobby” rather than a competitive profession.

1.2 Research problem and research questions

Set aside the ongoing debate, this thesis concentrates more on analysing economics aspects of eSports. We aim to bring out analysis on the current state and future of eSports, with evidences confirming that eSports is more than a “hobby” or a “temporary culture”, but it is, from financial and economics perspective, an industry. To prove our points, a comparative analysis will be performed. As traditional sports possess economics characteristics allowing researchers and experts to recognize them as a distinctive part of economics research, eSports will be put under the same examination. The thesis structure will be entirely depended on answering the research questions, with the introduction chapter serves as an answer for what the history of eSports is and what is the current relationship between eSports and traditional sports. In the second chapter, questions about the similarities and differences in economic characteristic of eSports will be solved by researching previous literature and academic researches. Next, to answer what the main keys affecting the demand for eSports are, a quantitative research method is selected. The data is then analysed and compare to the result of previous studies in the field of traditional sport. In the final part, limitation of this research and suggestion for future research are provided as well as the summary for the whole thesis.

1.3 Research method and findings

With the aim of analysing the similarities and differences in demand for traditional sport and electronic sports, an econometric model inspired by the two stages model used by Brewer, 1969; Gratton & Taylor, 2002 and Phaneuf, 2019 is elected. An online survey is created and post to different online forums, social media channels and students within University of Oulu. The survey is created to gather data regarding determinants of demand for eSports participants. The data is then split into two datasets, each contains eleven and twelve explanatory variables, respectively. The data is then analysed by using logistics regression in SPSS software. The result shows that Age, Gender, Income, Education and Full-time Employed have significant impact on eSports participants. On the other

hand, only Age, Gender, Income and Student are statistically significant in terms of participation frequency.

Several hypotheses are confirmed and are used as evidences proving the similarities between determinants of demand for traditional sports and electronic sports. The significant impact of Age, Gender, Income and variables indicating employment status on demand are similar to the findings in previous researches Gratton & Taylor (2002), Breuer et al., (2011), Barbara et al., (2007), Ruseski et al., (2011). In addition, the result of the determinants of demand on eSports participation is compared to that of gaming participation. Contrary to conventional beliefs, the socio-economics effect on gaming participation and eSports participation are not homogenous. In fact, a novel finding is found with empirical evidences pointing out the distinctive between the two. Gaming participants are seemingly bounded by Age and Gender whereas eSports participants, beside being limited by sex and age, are also limited by variables implying time as a constraint. As such result is comparable to prior studies in the field of traditional sports, eSports – from the economic perspective, are more similar to traditional sports than gaming.

2 LITERATURE REVIEW

Literature review will be divided into two main phases. In the first phase, background and growth in terms of revenue, prize, audience and investment as well as future impacts of eSports are provided. In the second phase, economic characteristics of traditional sports are first presented. Then, by applying the same theories on eSports, the similarities and differences between the two are examined.

2.1 eSports as a nascent industry

2.1.1 The background of eSports industry

Over the past decade, eSports has experienced a tremendous growth in many aspects. With its popularity, eSports has attracted a number of researchers to study it in large scale. Contradict to people believe, eSports origin goes back to the end of the 90s with technological progress allowed video games to reach mass audiences (Florian, 2019). And even before that, the first esports tournament was held on 1972, it was called as the “Intergalactic Spacewar! Olympics”, organized by Stanford University itself (Megan, 2012). It was until the beginning of 1990s that the first world game tournament can arise thanks major technology advances allow cyber sport to happen in larger scale. Nintendo immediately saw the opportunity and introduced “Nintendo World Championships” in the United States in 1990. Only four years later, Blockbuster and American GamePro magazine organized another world championship for video game players. From that point onwards, it was clear that competitive game is indeed possible.

With the worldwide expansion of video games, more and more networking events and gaming hubs appeared. As a result, ClanBase - the first eSports clan was established in 1998 (Larch, 2019). The emerge of KeSPA – Korean eSports Association was the landmark for the professionalization of eSports. In the first time in history, an organization was established with the intention of reaching out to mass audiences outside the gamers pool. 2012 witness the born of League of Legends season 2 World championship. This was the biggest competitive tournament of all time with total prize of \$2 million. By attracting more than 8.2 million viewers, it

became the most watched eSports event at that time. The success of this tournament has been recognized by the US Government. One year after the event happened, the government of United States officially perceived League of Legends players as professional athletes, meaning that LOL players will get the same beneficial treatment as any other traditional sport athletes. In the same year, League of Legends was accepted by the international Olympic committee as a sport and in 2018, it was played as a demonstration sport at Asian Games, marking eSports first step in being recognized internationally.

2.1.2 Growth

In this section, five main criteria contributed to the tremendous growth of eSports will be presented. Market growth potential will be highlighted by applying recent data about the raise in viewership, prize pool, consumer awareness, revenue, and investment.

i) Viewership

The size in eSports audience has grown exponentially in the last couple of years. In 10-year, period, the total number of viewers has raised from 134 million in 2012 to 454 million in 2019. Researchers and analysts predict the annual grow rate will be around 14%, making the total audience 644 million in 2022. In 2018, League of Legends Championship has drawn more than 200 million viewers, 99.6 million people follow the final match between Fanatic and Invictus Gaming featuring a peak of 2 million viewers, reaching the same number of viewers Superbowl had in the same year. One year after that, the semi-final between SKT and Fun Plus Phoenix has done the impossible by doubling the peak viewers in 2018 by reaching almost 4 million. According to Newzoo market research and analytics, the growth in viewers is stable and will likely to go on in the upcoming years. The number of occasional viewers is on the rise, hinting that eSports is gradually approaching viewers outside of gamers pool.

ii) Prize pool

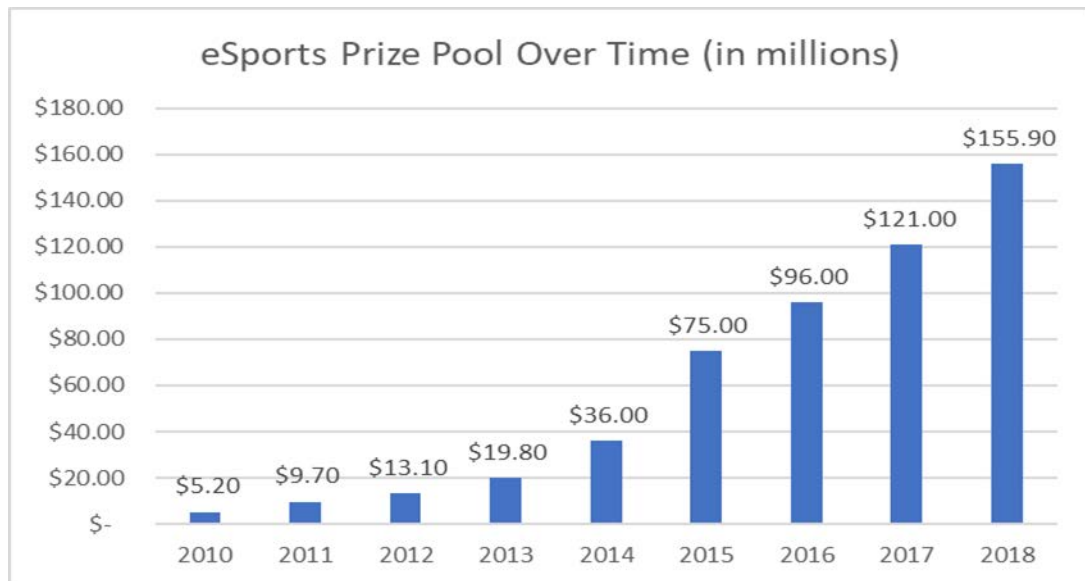


Figure 1: eSports prize pool over time (adapted from Statista, 2019)

The chart above illustrated the raise in prize money for eSports events in 9 years period. The rapid growth in terms of prize pool can be used to demonstrate the appeal of eSports. Between 2010 and 2017, the money prize almost doubled itself each year and there is no sign that the total amount will decline in the next couple of years. The official amount of prize money for 2019 hasn't been released yet, but let's take a look at top highest prize pool for each tournament, starting with the championship series for Dota 2 (\$34.3 million). In the second place is Fortnite World Cup Finals (\$30.4 million), League of Legends World Championship ranks 6th in the list by rewarding \$6.4 million. The preliminary total number for top 10 biggest eSports events in 2019 is \$180.8 million, 16% higher than the total number of all eSports events could offer in 2018.

iii) Consumer Awareness

With the raise in base audiences, eSports are expanding target pool by raising consumer awareness. According to Newzoo, at least 20% of eSports viewers are not playing the games, they merely enjoy watching eSports events. Along with the growth in viewership, eSports is building a strong fundamental in marketing its

brands and thus, raising public awareness. Statista predicts that by 2019, the number of people aware of eSports will reach 1.5 billion people. Newzoo in the latest report has made a prediction that 2021, half of eSports audience will not be active players.

iv) Revenue

Raise in viewership and consumer awareness eventually leads to the raise in revenue. In the Esports Ecosystem Report 2020, Business Insider announces eSports revenue has surpassed 1 billion dollar and is expected to hit 1.8 billion dollars by 2018 thanks to the exponential growth in big regions. Asia-Pacific, America and Europe are three main regions in terms of audiences and revenue (Reyes, 2019). In the upcoming years, the revenue is likely to grow thanks to the expansion in mobile section, leading by China as the biggest investor. Gaining attention from big players all around the world, several predictions about the future revenue of eSports are made, PwC, Business Insider and Newzoo in 2018 have estimated the value of eSports to be around 1 billion in 2019 and 1.5 billion in 2022. Goldman Sachs and Super Data are more optimistic with prediction of 1.5 billion for 2019 and 2.5 billion for 2022. At the moment, the revenue in 2019 is over 1 billion dollars, confirming the prediction made by these majority firms. Either way, the exponential growth in revenue of eSports is substantial, thus, above predictions might come true in the future.

v) Investment

In 2018, over \$4.5 billion was poured into eSports, breaking a new record in terms of number of investments and investment types. 2018 experienced a sharp rise in number of investment (68), doubled the amount in the previous year (34). In the first time in history, a relatively large number of traditional private equity investors decided to explore the eSports industry. While hands in hands with a significant rise in venture capital, the growth in private equity investors signal the maturity of the industry. Along with venture capital and private equity investments, family office and strategy groups also taking up a big part of the eSports pie.

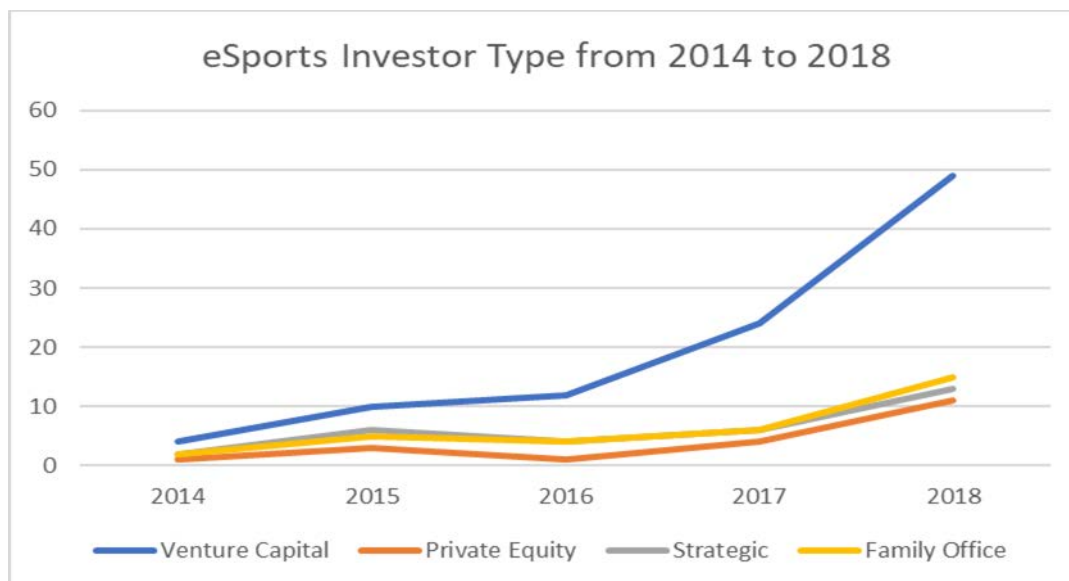


Figure 2: eSports investment type from 2014 to 2019 (adapted from Deloitte report, 2019)

Breaking down the change in proportion of investment type even further, the above plot demonstrates the trend in eSports investment between 2014 and 2018. As a nascent industry with proven consistency in growth rate, venture capital remains as the number one dominant driver. According to latest data published by Deloitte, venture capital investors largely concentrate on sponsoring media platforms & media (45%) and developers (31%).

As mentioned earlier, number of traditional private equity investors is also on the raise. There are 11 investments in this category, higher than the total number 2014-2017 had. Similar to venture capital group, most investments aim at advertising & media (36%). Through analysing the latest trend, Deloitte also pointed out a consistency in choosing big names as sponsored partners (Discord, Epic Game). Maturity leads to higher interests; strategic and family office type of investments are also experiencing growth. In family office group, investors are usually those who have deeper pockets, they often invest in group – “family” and able to take more risk in compare to traditional private equity investors. As 2018 becomes the golden year for eSports, all mentioned investment type saw an uptick in the total number of investments, indicating a bright future ahead for investors and for eSports industry.

2.2 Future impact of sport

2.2.1 *Future impact of traditional sport*

In 2012, SpEA (Sports Economics Austria), along with five sport departments and institutions in Europe conducted a research about the economic importance of sport in terms of economic and employment growth. A “sport satellite account system” was developed to analyse direct and indirect effect of sport on the economy by using input-output analysis. The result showed that by broad definition, sport value added amounts to 173.86 billion euro with the total effect (direct and indirect) add up to 2.98% of overall gross value. In the same manner, sport accounted for more than 7 million employment equivalents to 3.53% of total EU employment. The research also identified Recreation, Cultural and Services as the most important sector with the highest added value, followed by Education services at second place and Hotel services ranked third. SpEA also emphasized that the total share of sport was comparable to that of Agriculture, Forestry and Fishing sector and “every sixtieth euro generated and earned in the European Union is sport-related”.

As one of the major sources of sport related added value are from sporting events, many have tried to estimate ex ante impact on the economy. From economic perspective, the idea is to host big events with the intention of boosting local demand for goods and services. KPMG on assessing economy impact of sporting tournaments on Hong Kong in 2017 has appraised spectator expenditure on accommodation, food and beverage as the largest contributor to the economy. Moreover, participants were also adding lots of value to the total economy by paying for travel fees, especially in cases where participants were foreign based. Others, while attempting to provide ex ante analysis on economic impact often suggest the growth of employment and GDP by hosting major sporting events. For example, Maennig (2017) reported the ex-ante analysis on World Cup 2010 would bring South Africa additional \$2 billion and more than 38000 jobs (Grant Thornton, 2008) and the one in 2014 would bring Brazil additional \$50 billion dollars and around \$9 billion in tax (Earns & Young, 2011).

Even though the post-ante results are debatable and the effect of major sporting events like the Olympic and World Cup are still unclear, it is undeniable that beside economic benefits, there are non-economic advantages of hosting such events. Maennig (2017) while analysing the intangible effects of Olympic in Tokyo 2020 suggested that the high number of tourists had good impact on visa policy, employment rate – especially for women and elderly. The Olympic 1992 in Spain had helped the country to re-organize their transportation infrastructure and developed new strategy for urban regions where abandon lands were put into used. Thirdly, major sporting events were used to raise international recognition as these events would “put the city on the map”. These effects might not be measured by mathematics or statistical models, but they are important from economic perspective as economics are not only about financial gains, but also about “welfare”, “utility” and consumer satisfaction.

Speaking of major sporting events, many believe that the future of sports depends heavily on the growth of sport tourism. Sport tourism is already making big impact with many sport businesses offering direct and derived products to consumer. In 2011, each sport tourist came to see English league spent £785 compared to £583 of non-sport-related counterparts, adding total £706 million to the UK economy (Thorne, 2015). Solberg & Preuss (2007), on analysing the long-term effect of growth in tourism in Australia after Olympic games in 2000 proved that this major sporting event had led to 6% higher in total tourist number after 4 years period. Similar results appeared in majority of neighbour countries (New Zealand, Thailand, Malaysia). The upscale was said to also affect the hotel industry with empirical evidences implied a positive turn in the tourism demand, as hotel rooms demand raised significantly in all of Olympic host cities. For example, the increase in hotel rooms demand in Sydney in 2000 was 40%, and 62.5% for Beijing in 2008.

2.2.2 Future scenarios for electronic sports

Data and figures presented in previous parts can be used to demonstrate the exponential growth rate of eSports. It is no doubt that with the advancement of technology, eSports will continue to grow and contribute more to the common economy. Unfortunately, there aren't enough researches and data to perform in-depth

analysis about the current impact of eSports on nowadays economy. However, the growth of video games industry has a close relationship to the growth of eSports. Siwek (2017) estimated that in 2016, gaming industry contributed more than \$11.7 billion to US total GDP with the growth rate of 3.7% for the period of 2013-2015. In addition, the total direct employment was around 67000 and those who were broadly related to the industry were more than 220000. In a three-year period, the total added value has raised exponentially, reaching \$43.4 billion in 2018 and there is no sign that the growth is going to slow down in the upcoming years.

On analysing the future role of eSports, Jonasson (2010) believed that eSports will develop in line with the characteristics of modern sport. She then presented three possible scenarios regarding the future role of eSports: “as a counterculture or alternative to modern sport, as part of the hegemony of sport or as the future hegemonic sport”. Inspired by Jonasson’s theory, this part of the thesis will be used in an attempt to elaborate her argument by providing personal propositions. The third scenario where eSports dominate traditional sport was described as an “exaggeration” – an amplify of what eSports could possibly become. With the rapid growth of technology and robotics, consumer habits and lifestyles have changed dramatically. One cannot simply weigh the influence of high tech on shaping human lives, but we all agree that automation certainly has altered the way people work, live and participate in recreation activities. As Jonasson & Thiborg (2010) stated in their research, that sport – by bearing similarities to other form of arts, reflect how our society works. From this standpoint, eSports are seen as the evolution of traditional sport, one that in line with modern societal values. Majority of human beings have already living in a tech-saturated world, as our lives being digitalized, and even experts confirm that such transformation is not likely to stop, isn’t it inevitable for sport to transform as well?

“Sport” is a broad term used to describe all type of activities we have, ranging from basketball to skiing or ice skating. Some activities require physique traits, others require dexterity and precision. If we examine eSports in the same fashion, there are resemblances between the two. It is true that technology has already changed how we perceive sport, and eSports in some manners can be seen as the product of technology merging with sport. However, the future where eSports overcome sport is

improbable. The biggest distinction between the two lies in the physical benefits that traditional sport can offer to consumers. Experts have long proved the physical and psychological benefits of participating in physical activities, and as sport is positively linked to exercises and fitness training, doing sport can make a great impact on the health outcomes of participants. eSports, on the other, cannot present the same proposal. On the contrary, eSports are often pertained to negative stigma of rising health risks. Due to its nature, electronic sports are being tied to the gaming community which already suffers heavily from inherent biases. Playing video games are infamous for some negative effects such as addiction, aggression, stress, time and money consuming. Gaming is often accused of being main cause for anxiety, emotional sickness, violent behaviour and memory loss.

Suffering from such negative reputation, eSports are less likely to surpass traditional sport in terms of popularity and applicability. Despite having an exponential growth regarding revenue and recognition, the lack of health benefits will prevent electronic sports from achieving the status of a hegemonic sport. As stated, eSports as a hegemonic is the least likely to happen, however, current evidences are pointing toward either the first or the second scenario in Jonasson's theory. Jonasson described her first prospect as eSports posited itself as "a counterculture or alternative to modern sport". Majority of sport participants view electronic sport as an underground culture, an emerging opponent to contemporary sport. In terms of competitiveness and entertainment, electronic sports can be consumed in the role of a leisure activity. Hence, to a certain degree, eSports can be seen as a counterculture to modern sport. On the other hand, a few others recognize it as an independent sport, one that doesn't require too much physical attributions like chess. In recent years, eSports have successfully infiltrated some of the biggest markets and are recognized as a real sport by Korea, China, Russia and the United States. Electronic sports have also gone through several important milestones marking its international acceptance, e.g. being recognized by International Olympic Committee in 2018 and was played in Asian Games 2018 as a demonstration sport.

With the above evidences, it is feasible for eSports to become a counterculture or an alternative to traditional sport. As Jonasson later stated in her research, one that we completely agree, that with the good momentum of development, eSports could

become a part of the hegemony of “sport family”. In the third scenario, the position of electronic sport is strong enough to be fully accepted as a part of modern sport, but to reach that status, there are few essential standards electronic sports need to fulfil. To understand Jonasson’s statement, it is crucial to know the current circumstances of electronic sports in the modern society. Mainstream media often present electronic sports as a form of competitive gaming, resulting in less recognition from authorities and majority of sport enthusiasts. For a long time, electronic sports and gaming are interchangeable, leading to the imposition of negative reputation on eSports. Despite recent research disregarding the negative effects of gaming, there are steps eSports need to take to eliminate the disrepute. For example, eSports are shown to have good impact on human brain as it improves cognitive abilities. Moreover, eSports players can benefit from strategy planning, multitask and concentration. If eSports can show that it can offer more positive than negative outcome, then it would perhaps easier for consumers to welcome it as a part of sport.

Luckily, thanks to its rapid growth, eSports have gradually built a solid image in the limelight. Such extraordinary advancement leads to the recognition of eSports in several countries. However, as Jonasson already explained in her research, electronic sports need to be officially recognized as a sport by International Olympic Committee and need to have independent institution that manages all of parties within eSports at international level. At the time being, eSports are halfway in completing the first condition in Jonasson’s statement. In 2017, The International Olympic Committee issued an announcement confirming that they were considering eSports as a sporting activity. Later in 2018, they rephrased earlier statement and clarified that they were more into video games that resemble traditional sports (Webb, 2019). Nonetheless, IOC expressed their interest in eSports genres that could make use of virtual or augmented reality to fulfil the physical requirement. And as IOC being the big bad boss preventing eSports from fully recognition, above statement from them could be used as a hint of a better future.

Turning to the second condition of having an international administration, The International Esports Federation can be seen as a good start. The organization was established in 2018 with one sole purpose: “IESF is working for a world where Esports athletes can compete on the same level and with the same support as athletes

from traditional sports". IESF has been consistently promoting electronic sports as a part of modern sport family for the more than 10 years with 60 nation members. In 2013, IESF has brought eSports to 4th Asian Indoor and Martial Arts Games, marking a breakthrough for electronic sport. In 2014, IESF was approved by World Anti-Doping Agency, terming the integrity and fairness in competitive gaming. Considering IESF previous movements, this organization have sufficiently abided international rules and regulations regarding IOC charter. Thus, The International Esports Federation can fulfil Jonasson's second condition, bringing eSports closer to the future where eSports are officially part of the hegemony of sport.

In conclusion, despite variety of obstacles lying ahead, eSports fans can be optimistic about a positive outcome. Among three scenario Jonasson presented in her research in 2010, the second one stands out as the most promising. It is not only thanks to eSports enthusiasts that boost its performance and reputation, the whole gaming industry, tech giants, and even some government organizations are backing up electronic sports success. First, with eSports being legitimated as a conventional sport, eSports professional players will get better benefits from sponsoring and funding. Secondly, in many countries like Korea, beside monetary rewards, athletes are honoured with higher social status and exempted from military services. Moreover, game producers and tech giants are actively pushing for the legitimation of electronic sports. Being a part of sport family will make eSports became a mainstream activity, hence, organizations and investors will more likely to get access to a bigger fanbase, resulting in higher revenue.

3 ECONOMIC CHARACTERISTICS

In this part, industry segmentations and product types of traditional sport and eSports are introduced. Then, previous literatures regarding demand and determinants of demand are presented.

3.1.1 Traditional sport by segment

Before analysing the demand of any good or service, it is essential to understand the nature of that product or service. By recreating product type model created by Pitts, Fielding and Miller (1994), we want to outline three main segments within traditional sport industry.

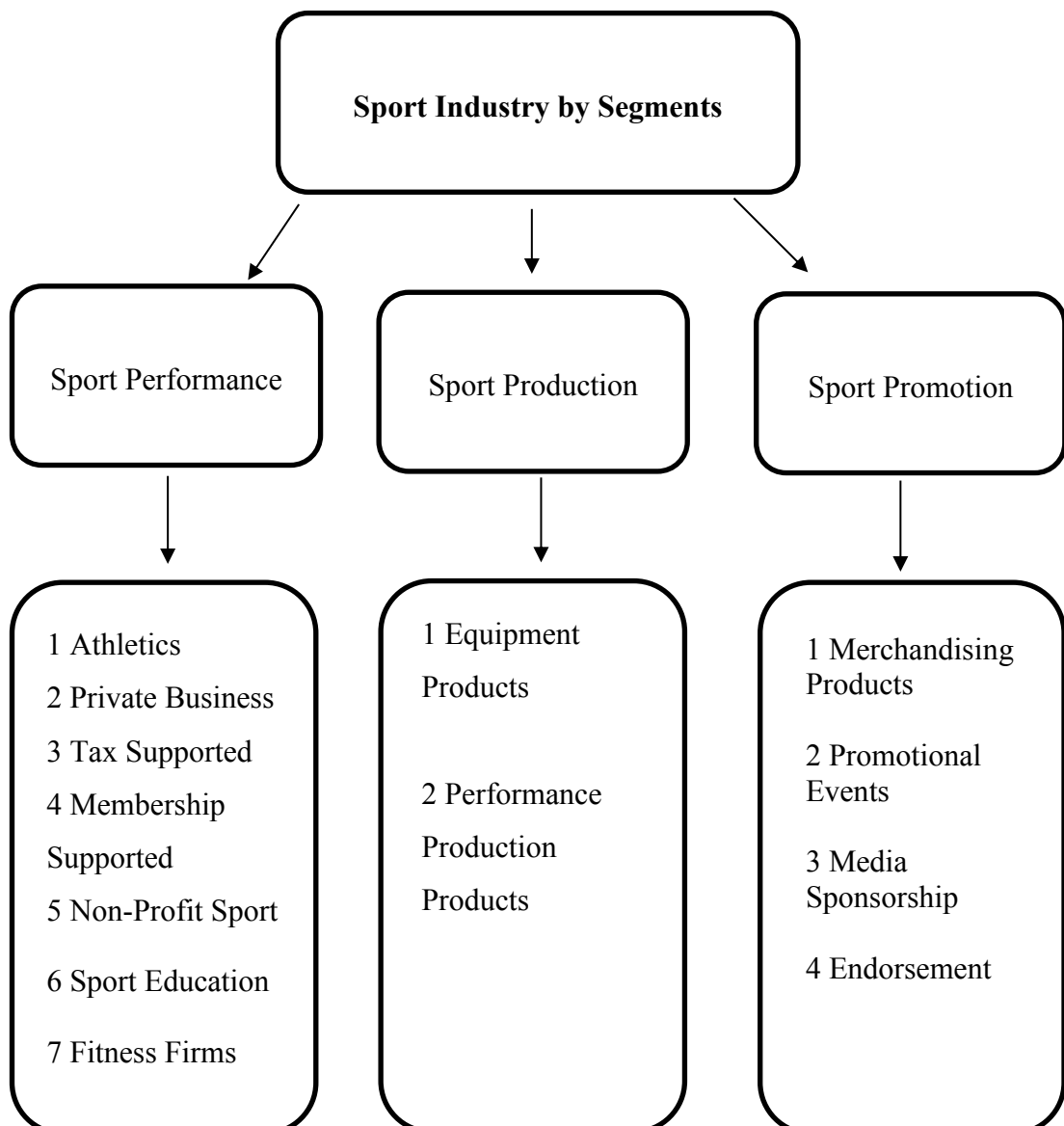


Figure 3: Sport industry by segments (adapted from Feilding & Miller, 1994)

Sport performance, as a product, can be offered to end users in two ways: for participants and for spectators (Pitts, 1994). Participants are free to choose any product types that suit their needs. These product types are spread widely to meet different customer targets based on their age, gender, or skill level. For spectators who want to view sporting events or matches, most of the products offered in this category can be attained at no cost. Thanks to the advance of technology, consumers can easily watch their favourite football games on their couches at home, through their phones or watch livestream on any social media channels.

Sport productions comprise products that boost the performance of sport activities. And since traditional sport is defined as “activity involve physical exertion”, buyers can look for all kind of products and services, ranging from gears and clothes to medical care and fitness trainers. Not to mention, “spacing” in traditional sport is also important issue as previous research has linked performance to quality of the facilities. Sport participants need this product for skill practice while third party want this to enhance spectator’s convenience.

In sport promotion segments, consumers are also offered different range of products used for advertising or promoting purpose. Just like any other products in the market, advertising and promotion play an important role in sales improvement. Therefore, marketing campaigns and events are exclusively made depending on sport types. For example, popular sports like football often use merchandises as a way to generate profits. As a common way to advertise key players or sport organizations, goods are often put on sale to attract viewers and satisfy fans.

3.1.2 Electronic sports by segment

Comparing to traditional sport, eSports has a rather much simpler ecosystem comprises four main elements: consumer contributions, sponsorship, media rights and advertising. Among the four, sponsorship and advertising are the largest contributors and can take up to 70% of total revenue, the rest is distributed evenly by

the consumer contributions (ticket sales, merchandises) and media rights. The ecosystem of eSports can be demonstrated as follow

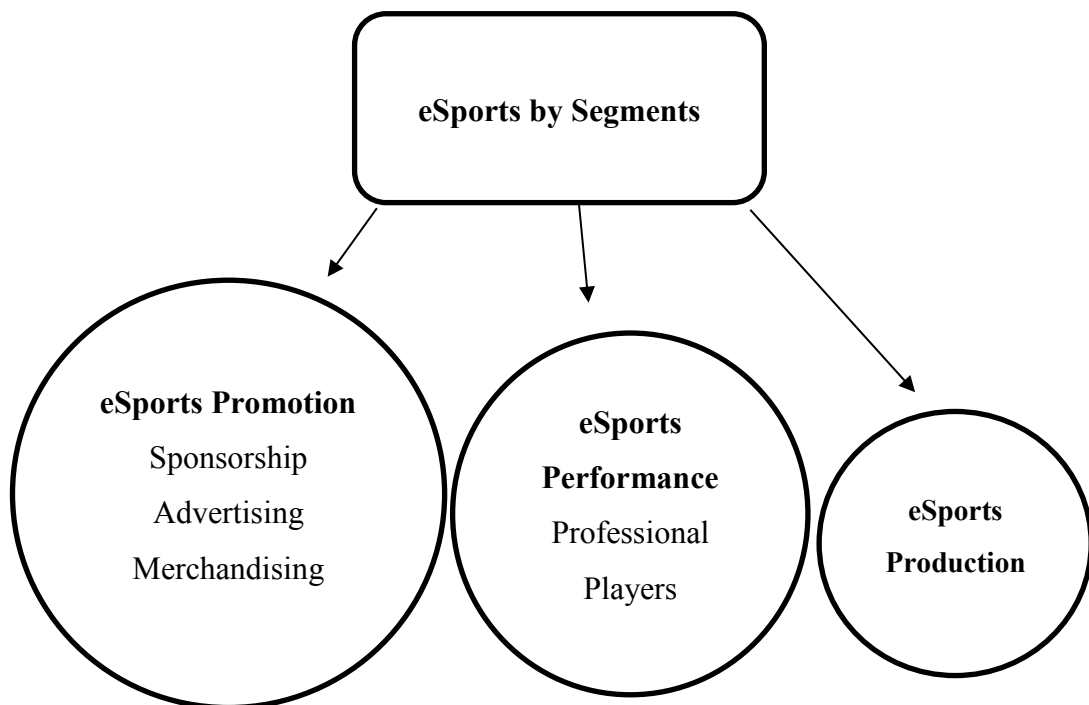


Figure 4: eSports by segmentation

i) eSports Performance Segment

Before getting to performance segment, it is crucial to point out that eSports and gaming is not interchangeable. Gaming is simply an action where players play or practice video games. Gamers can choose between variety of different genres ranging from multiplayer games to individual games with no competitive elements involved (Elchison, 2019). Whereas, eSports – similar to competitive sport, are reserved entirely for professional athletes and elite players only.

Resembling traditional sport, eSports performance products are offered to end users in two ways, consumers can either choose to participate or to spectate. However, eSports is purely about competition. Consumers can choose to participate but the standard to join is extremely limited. Up until now, there are very little evidences on other type of performance products offered to regular consumers, eSports seem to

exclusively for players with strong skill sets, those who want to compete against other players at competitive and professional level.

eSports fans, on the other hand, are given lots of freedom in choosing platforms to watch their favourite games. Viewers can choose to view matches through television, social media channels, through attending live events or through streaming platforms. Watching in person is believed to be the original form of spectating and it fits well with traditional competitive sport. With eSports, the most common way to view a match is through streaming platforms. These platforms are used to broadcast live events to massive audiences, some of the popular names are Twitch, YouTube and Steam TV. They are not exclusively built for eSports events, but their primary users are gaming organizations and professional players.

Streaming and eSports have been intertwined since the beginning of eSports. There are several possible explanations for the rise in popularity of streaming service. First, users can easily connect to streaming platforms through their electronic devices like laptops or smartphones. With their mobile devices, one can get access to these platforms from anywhere at any time. Comparing to inherent methods (television& radio), there are less boundaries and requirements for a streaming service to operate. Secondly, mainstream television has not been the right field for competitive gaming events (yet) and so does watching in person. Hence, financial wise speaking, instead of building stadiums and arenas, it is far easier and cheaper to set up an online platform.

ii) eSports Production Segment

eSports production segment includes products mandatory to produce an eSport match. Take basketball in traditional sport as an example, there are certain equipment and gears like basketballs, basketball hoops and boards (to keep track of the scores) necessary for basketball players to actual play the game. Same logic applies to eSports, there are mainly three type of products consumers can choose from: equipment, apparel and performance products.

In the first category, buying products can be entirely depended on personal taste, there are many different brands, colours, models and prices to choose from. Or they can be compulsory e.g. professional teams will need special gaming gears – those uniquely built for professional players only. Games like League of Legends or Dota are MMORPG (massively multiplayer online role-playing game), and at competitive level, players need to have absolute concentrate and instant communication with their teammates. Thus, many competitive players in this genre often request special keyboards or headsets with white noise cancellation to help out eliminating all sounds from the audiences. In apparel section, products can be also required or referred. There are teams who might need uniforms (required) and there might be individuals who can choose whatever they can afford for (referred). Even though there are little to no physical activities in eSports, there are certain type of performance products required to support players. Athletes, in general, need medical care and trainers. They also need facilities (stadiums, arena, gaming houses) to practice and compete.

iii) eSports Promotion Segment

a) Sponsorship

By definition, sponsorship portrays a reciprocity relationship between sponsors and sponsored. In sport, sponsorship is a strategic communication tool for organizations to promote brand images, enhance visibility and strengthen brand loyalty. Since this is a mutual relationship, sponsored parties are provided with funds, goods and services (Radicchio, 2014). With the exponential growth, eSports has attracted a fair number of investors. In 2018, more than \$4.5 billion has been invested into eSports and the number is predicted to grow in upcoming years. Breaking down the investment into smaller categories, the amount spent for sponsoring and advertising was \$694 million and is expected to reach \$1.2 billion by 2021.

Top competitive games like League of Legends, Data, Overwatch and Fortnite have attracted thousands of endemic sponsors. Endemic sponsors are well known brands whose products used in eSports promoting or eSports producing. They can be tech giants (Microsoft), hardware manufacturers (Intel, MSI) or electronic retailers

(Amazon). In the latest report created by Matt Nicholas in 2018 about eSports sponsorship, more than 88% of all team deals and 65% of all event deals are generated from endemic brands (Nicholas, 2018). In both sectors, contribution made by Computers & Software as well as Consumer Electronic brands take a strong lead, 66.7% and 48.4% respectively.

In recent years, eSports has expanded its sponsorship horizons with non-endemic brands joining the field. Among top league sponsors, more than 8% are from energy drink brands like Coca Cola and Monster. In their attempt to appeal young audiences, eSports team are given a lot of supports from famous brands whose products are non-related to the production of eSports. They can be financial services like Deloitte, dating services such as Tinder, car manufacturers like Volkswagen, Audi and even energy companies like Fortum want to set foot in this nascent industry. In 2018, U.S Airforce announced their sponsorship with Cloud9's CS: GO roster. While in 2019, fashion luxury brand – Luis Vuitton has declared its partnership with Riot Game, including sponsorship contract that worth more than \$1 million. Riot fans are now able to buy in-game skins exclusively designed by Luis Vuitton. Fun Plus Phoenix - last year world champion team was also rewarded with a unique summoner cup trunk, also made by LV.

b) Advertising

Breaking down sub-categories within sponsorship and advertising in eSports, in 2018 poured \$526 million into networking & social media, making it the most attractive investment category. Streaming services came second with \$135 million while news agencies and advertising received \$21 and \$6 million from investors. Unlike traditional sport, eSports exclusively offer products appeal to young demographic. As its most distinctive feature being electronic competitions, networking and social media becomes the most engaging channels for sponsors. Hence, promotional merchandising products – streaming platforms and streaming services are quick to receive a lot of attention from sponsors and investors as invested amount raise by over 200% from 2017 to 2018. Not to mention, Tencent – one of the biggest game companies in the world has poured more than \$1 billion in developing two streaming platforms in 2018.

c) Merchandising

One special thing about eSports merchandising is the in-game purchase system. Gaming, as mentioned above, is created as a leisure activity where participants are given chances to do all the things they want to do and be whoever they want to be. In short, video games provide all type of fantasy worlds, some can have similar setting to the real world, others can contain magical elements. And no matter what it is, a world needs to be filled with tools, items and characters. For that, most games have shopping function where players can buy objects, characters, expansions...etc. Among those, “skin” is so far the most popular one among buyers and the most profitable one for game organizations. People like clothes, this is true even in gaming world. Game developers understand their consumer psychological needs and create a function where players can customize their characters. Skins don’t usually provide any competitive advantage; however, buyers love them for aesthetic reasons. In 2017, in game purchase has brought back more than \$4 billion for Activision-Blizzard, with skin purchasing covers half of the amount (Sloun, V. S, 2018).

3.2 Traditional sport and eSports as commodities

i) Sport as a commodity

Gratton et al. (2000), in his research about economics analysis on sport and recreations, classifies traditional sport as a commodity. According to Gratton, traditional sport possesses characteristics like a consumer good. First, he classifies it as a non-durable due to its seasonality and consumers tend to receive short-term satisfaction from watching sport games. Secondly, traditional sport is also viewed as durable good, based on the long-term utility (satisfaction) it provides. Moreover, similar to a durable good, stock (health benefits) depreciate overtime without further participation. Thirdly, sport can be a capital good, the one that “yields a return as part of a market production process”. Sport, in a way, can be seen as an investment where participants invest time and money to upgrade their skills and performances, to a point where they gain a return through sporting activities.

ii) eSports as a commodity

eSports does act as a commodity. From an economics standpoint, unlike traditional sport, esports is more likely a pure service. Taking Gratton's perspective, it can be seen as a non-durable good by offering the same utility to consumers (satisfaction from watching tournaments or competitions). However, eSports does not provide long term utility (health benefits) in the same way traditional sport grants its consumers. Secondly, while Gratton and Taylor (2000) 's theory depends heavily on health benefits, there hasn't been a throughout research conducted in the eSports field that can back up this theory. Nevertheless, yielding a return from competitions and tournaments by investing in the training process is something traditional sport and eSports have in common. Regardless of playfields, professional players at peak performances earn their returns through hard training, potentially lead to skills and performances enhancement.

3.3 Determinants of demand for sports and eSports

While reviewing traditional sports and eSports from economic viewpoints, per proving them with economics characteristics of a commodity, other relating factors will also be mentioned in the upcoming part. In the next section, consumer demands and the determinants of the demand will be presented.

3.3.1 Time as a constraint for leisure activities

In this section, the theory of income-leisure trade off and its impact on time will be presented. In additional, evidences on differences among nationalities and genders leading to discrepancies in time allocation for leisure activities will be delivered.

From economic standpoint, when analyzing the demands of a certain goods, one needs to look at three classical determinants: price of the goods, demanded quantity and buyer's income. In this particular case, by being tied to leisure and recreation activities, both traditional sport and eSports have time as constraint. From an economic perspective, the optimal working hours one should do is decided by maximizing utility in terms of consumption. An individual need to spend time (by working) to make an income. Income helps he or she to purchase goods or services satisfying her needs. On the other hand, leisure can also be seen as a commodity that

allow consumers to yield direct satisfaction from engaging in leisure activities. Thus, economists often regard the relationship between leisure and time as a traded-off, meaning one either sacrifices time to work for higher income or sacrifices time to leisure resulting in less income. In reality, the trade-off depends heavily on the wage rate. Rationally, there would come a point where additional income gains from additional working hours cannot make up for the loss in leisure time. The diagram below illustrates an individual income-leisure equilibrium where OM represents maximum amount of time one can work in a day and OT represents maximum amount of time one can enjoy leisure activities. MT represents budget constraint and three indifference curves describe different combination in terms of leisure and income. E is the tangent point or also known as optimal point where an hour of leisure equals an hour of wage rate.

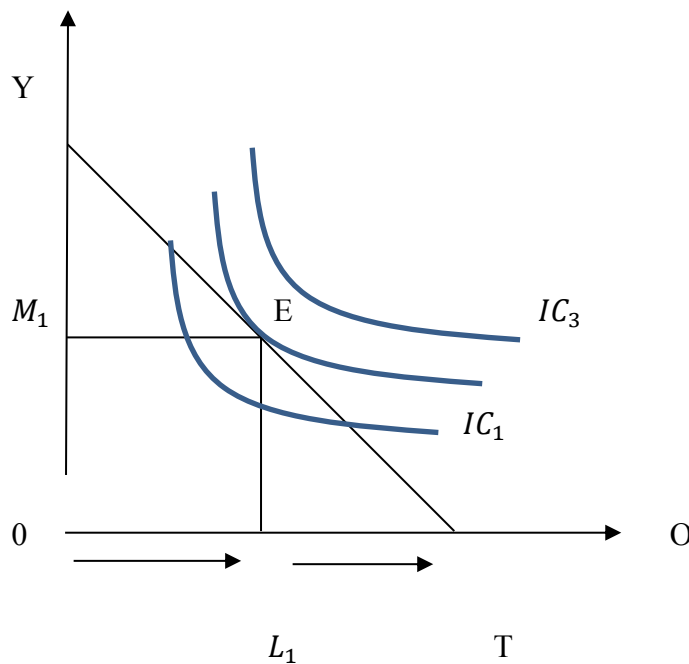


Figure 5: Individual income-leisure equilibrium (Adapted from Singh, 2018)

One might ask what would happen when wage rate is higher or if the cost of leisure rises? Using consumer choice theory, there are two contradict scenarios that could happen. First, if the salary is higher and the working hours remain the same, consumers will have more purchasing power, lead to higher desire to cutdown working hour and purchase more leisure. In the second scenario, when the price rises, the demand is expected to be lower. Basically, when the cost of a good or service increases and the income remains unchanged, people are less likely to

purchase it and more likely to buy an alternative product, as substitution effect states (Gratton & Taylor, 2002).

Looking further in working hours, there are discrepancies among countries, genders and age group. Many Asian countries are considered as “work-a-holic”, the same applies for the United States. In the latest published statistics made by OECD in 2018, Korea leads by having 1993 average annual hours actually worked per employed person, United States comes second with 1786 hours, follows closely by Japan with 1680 hours. Note that there is a tremendous high gap in working hours between United States and Germany. On average, an American citizen works more than 200 hours, equivalent to 5 weeks more than a German worker. With such a high workload, it is safe to assume that the amount of time spent for leisure in these countries are more limited, comparing to their counterparts in other continents. Consistent to previous assumption, the amount of time spent for leisure activities are presented in Table 2 with the United States and Korea having least leisure time while Germany and Finland top the chart with more than 15 hours for recreation activities.

Table 1: Average annual hours actually worked per employed person in 2018

Country	Hours
Finland	1555
Germany	1363
Korea	1993
Japan	1680
United Kingdom	1538
United States	1786

Source: OECD Statistics

Table 2: Time devoted to leisure by country in 2017

Country	Hours per week
Finland	15.17
Germany	15.55
Korea	14.7
Japan	14.85
United Kingdom	14.92
United States	14.44

Source: OECD Statistics

Another survey made in the same year showed there is a steady growth in the number of weekly hours of work in the United Kingdoms from 2010 -2018 between man and woman. The long-term effect of the financial crisis in 2007 – 2008 is the main cause for the fluctuation in the dataset. From that period onwards, both men and women in UK overall experience a slight increase. For men, the number goes up from 564.7 in 2010 and reaches 623.5 in 2018. Likewise, for female workers, the trend is also on the rise and end up with 414 in 2018. The data suggests that in total, female work less than male, but it does not subsequently lead to more leisure time for them.

Previous researches in gender role-based supporting evidence that in general, female have less time for leisure than male. (Xinyu & Yanwei, 2007) presented their analysis on how men and women allocate their time on weekday and weekend and in both cases, men are proved to have longer duration in terms of free time. Despite having much lower working hours, female respondents in this research spent higher time in maintenance activities (housing chores), hence, their leisure time declined significantly. The situation was even worse in the weekend with the gap being widened further. In 2019, a new research explored how men and women spend their

time over their life cycle. (Viollaz & Wash, 2019) examined the patterns in time allocation between men and women in 19 countries. According to their research, despite differences in age, income, social status and childcare situation, female respondents were tied with more household duties than their male partners.

What we can learn from previous literature is that there is no flawless way to pin down the optimal amount of time for leisure activities. Women and men perceive time for leisure differently due to differences in social and personal responsibilities. Time allocation is also under the influenced of the economy, policy, social and natural impacts. Even though, there are some highlights in previous researches: men tend to work more than women. The amount can be affected by externalities, but the trend is persistent. Women, on the other hand, have less leisure time than men despite not working as much since they are bounded by more household responsibilities

3.3.2 Time as a constraint for sport and eSports

In this part, previous theories on time as a constraint for leisure activities will be applied to highlight the impact of time on traditional sport and eSports participation.

Previous literature researches often regard leisure as a normal good (Mocan & Altingdag, 2011). In our case, eSports and traditional sport can hypothetically considered as goods – normal goods. In microeconomics, income effect is used to describe the change in income and demand and the demand for normal good is said to have positive correlation with income, meaning eSports and sport – as leisure are expected to be consumed more when income raises. In a similar manner, substitution effect can be used to predict consumer behaviour when the costs of purchasing sport and eSports are higher. Per view them as normal goods, when the price increases, consumers will more likely to swap them for substituted activities with lower prices, indicating shorter time spent for sport or eSports.

By using statistical evidences provided by Eurostat, per analysing sport participation frequency within a week, countries with proven empirical evidences of having abundant time for leisure activities were reported to have spent more time for sport.

Among 28 EU countries, those belong to Nordic regions along with Germany and UK had the average time spent for sport higher than the average of total surveyed countries. Other countries with higher average annual hours actually worked per worker like Czech Republic, Hungary and Italy were theoretically had less time for leisure activities. Since the result aligned with the given hypothesis, these countries actual time participating in sport were lower than the median number. Looking at the average hours spent for competitive gaming, even though the differences in time allocation for eSports between countries are not that significant, the trend is quite similar to that of traditional sport. According by a market research carried out by Limelight Networks in 2019, individuals who live in countries with low annual working hours like Germany and were reported to spend slightly more time on gaming than those live in work-a-holic countries like South Korea.

A large proportion of researches have proved that men participate in sport more than women do, and the amount of time they spend in practicing sport is far higher than female participants. Many have attempted to explain the gender disparity in sport participation, while politicians blame the lack of professional female leagues, scientists use evolutionary theory to interpret men psychological behaviour as they suggest that biological differences between men and women might be the reason. Either way, the huge discrepancies in time allocation for sports between the two sexes exist and apparently, the same discrimination is repeated when it comes to eSports. Female players are underrepresented in both professional leagues as well as in normal gaming community. In early 2019, Venture Beat reported only 30% of eSports players were female, the number of female eSports watchers were slightly higher (34%) and had the tendency to raise in the upcoming years. However, statistical figures indicating a huge gap in eSports participation between men and women.

Ruseski, Humphreys, Hallmann & Breuer (2011), while examining the association between family structure, time and sport participation, had pointed out the negative effect of caring for children and relatives on sport participation. Families with children under 18 were proved to suffer a negative impact on time spent for sport participation. Consistent with previous researches, employment status did effect on sport participation frequency as respondents with full time or part time jobs had less

time for sport compare to those who were unemployed. The trend was repeated in cases of household with children moving from colleague to full time jobs, indicating the substantial impact of working on time constraints.

3.4 Demanded quantity

In the previous sections, through outlining the product segments within traditional sport and eSports, two main type of products has been introduced: spectating and participating. The main component - sport participation, can be viewed as direct product while others are seen as derived products (Borland & Macdonald, 2003). When a consumer decides to purchase a sport product or that they are participating in a sport directly, they will need to buy necessary gears and equipment. This to say, to estimate the demand quantity for sport, we can approach the matter by analysing the demand for sport participation. For instance, to spectate a football match, audience will have to possess a television as the minimum mean to watch the game. Or when they decide to join a football team, there are certain apparels like uniforms, footballs, nets, gloves... that are mandatory requirement. Similar rules can be applied for eSports. Spectating eSports match require viewers to equip any streaming devices that fit the purpose of watching the game from a far distance, or in the case the demand is for live attendance, they will need to purchase tickets as derived product.

3.4.1 The determinant of demand: price

A product is considered to be “demanded” only when the buyers are willing to pay for it. Wanting a product doesn’t necessary mean demanding it, what distinguish the two lies in consumers’ s desire to purchase. Rationally, consumers desire to purchase a product are likely to be altered due to changes on price level. Drayer & Rascher (2013) shared the same opinion that consumer attitudes and preferences are affected by prices. Hence, higher price tends to lower the demand and vice versa. However, determining price for sport has been an unsolved problem due to lack of information. The most critical issue is that no sport is the same and there hasn’t been a longitude research on analysing the optimal price for them. For example, participating in golf is expected to be more expensive compare to participating in basketball.

Gratton & Taylor (2000) proposed the idea of estimating price by compositing all costs of sports. In such case, for traditional sports and eSports, pricing can be calculated by combining the price of direct and derived products. However, as there are different genres within the two, it is not possible to provide an exact price for each of them. In general, pricing for tradition sport and eSports will include participation price like cost of tickets, transportation cost, cost of time and derived price such as merchandising cost, equipment cost, subscription cost. Since existing literatures have linked prices with the consumer sport participation frequency, in cases where mandatory costs or the direct costs are considered the same for all genres, the change in derived costs will more likely to affect the frequency of participation.

3.4.2 The determinant of demand: income

Neoclassical economics assume that consumers would choose the optimal bundle of goods that is smaller or equal to their income. Income has always been a huge constraint affecting consumers buying power. Economists often refer the change in income and the demand of the goods as income elasticity of demand. As previous literature would rather describe sport as normal goods, one would expect the rise in income to have a positive effect on sport as well as eSports and vice versa. Humphreys & Ruseski (2007), provided empirical evidence proving that higher income can link to higher probability of participating in sports. However, they also stated that higher income did have a negative impact on the frequency in sport participation, which consists with the traded-off theory. Income is also a significant factor when it comes to sport expenditure (Beuer, 2009). Consumers with better financial budget are believed to spend more money on purchasing sport merchandise. Financial status in many cases can be linked to employment status. Thus, employed workers tend to pay more money for sport consumption in compare to unemployed ones.

3.4.3 Prices of substitutions or complements

A product is demanded when buyers are willingly pay a certain price to obtain it. The price level of the product and its substitutions or complements, however, can

strongly affect consumers decision. Rationally, if the price of the product is too high, consumers are more likely to switch to other products with more affordable prices that still can satisfy their needs, which we call as substitution goods. In case of price rising in one product causing the lower in demand of the other product, they are seen as complementary goods. The relationship between price and changes in demand in these cases can be examined through cross elasticity of demand function.

In our case, one might not able to provide concrete examples for sport substitutions and complements. Perhaps in the case of eSports and spectating sport, if looking at them as leisure activities, then other equally leisure exercises such as reading books or attending musical events can be seen as substitutions. However, in the case of traditional sport, the exercise of sport also provides health benefit, which none of the common leisure activities can provide. With such characteristics, even though the price of sport does change, it is not easy to predict how it would affect other. Without further evidence, we can only provide example for spectating elements within sport and eSports participation. In spectating, consumers can either choose to attend the live events or watching at home. They can be seen as complementary goods since the rise in one of them leads to the lower in demand for the other (Andreff & Szymanski, 2006).

3.4.4 The determinant of demand: Consumer preferences

i) Traditional sport

Preferences or individual tastes are often regarded as biases affecting consumers purchasing choices. Gratton (2002) believed that personal taste is the most important variable affecting consumer demand for leisure activities, others like Breuer, Hallmann, Wicker & Feiler (2010), linked personal tastes to socio-demographic patterns such as age, sex and education. Since previous researches had already presented concrete evidences confirm the dominant of male in sport, many researchers have questioned the cause of female disinterest. Murphie (2018) suggested that it might be due to a psychological barrier that prevent females to participate in sport more often. In her research, one third of female respondents

explained that they were fear of being judged by others based on their appearance, skillset and by inherent prejudices against them.

Kluger (2016), looked at the matter from biology perspective as he believed that in throughout history of evolution, male species had the tendency to gather in one place to showcase their fitness features to threaten other male opponents. Female species are then put in the position of spectators where they watch and pick out male partners with outstanding performance and strong physique features. Deaner, Lombardo & Balish (2015) strengthen the argument by pointing out the differences in sport motivation between the two genders as male athletes often showed that they were more into competitiveness as they chose to engage in extensive training and to engage in more competitive contexts than female athletes. Secondly, after completing a tournament, many male athletes tried to enter additional tournament immediately while female counterparts did not show the same incentives.

However, results from recent researches might indicate a shift in sport participation trend. According to a research made by Eime (2016), by using the Australian sports database for analysing participation age profiles, Eime and her colleagues found out that the proportion of male participants belong to age group of (4-7) was higher than female encounters with the same trend repeated in age group (18-29). However, the proportion of female participants belonged to age group (8-17) surpassed that of males and above 50, there were barely any differences. A similar survey was carried out in UK in 2019 by Sport England showed a similar result. The gender gap between men and women had been narrowed down by 27%. Compare to the previous year, 28000 women had decided to take part in at least one physical activities for at least 150 minutes per week.

On the other hand, the situation for the differences within age groups do not seem to change as sport continues to be a young people activity. Both earlier and current studies show a negative correlation between age and sport participant. Harvey, Eime, Charity & Payne (2016) on analysing level of sport participation, presented age group of 18-24 as the peak level with majority of participants are within this range. Beyond the age of 24, the participation rate declined rapidly despite gender differences. Researchers believe that the diminishing in number of older participants

was due to them considering the trade-off between income-leisure, as a consequence, their time for sporting is limited compare to younger adults.

ii) eSports

Unfortunately, as eSports being a nascent industry, there aren't enough data and researches on the matter. What we have known so far is that the gender gap does exist in eSports with more than half of frequent participants are male. The situation is even worse at professional level where almost every major tournament is exclusively for male athletes. However, recent analysis done by market intelligence companies like Newzoo provided more insights hinting for a better future where the gender gap is narrowed down. In a consumer insight report done by Newzoo in 2017, the three main platforms for eSports participants were identified to be mobile, PC and console. While PC and Console have been played an important part throughout the history of eSports as they are the main platforms for competitive gaming as well as eSports tournaments, recent years saw a tremendous growth in popularity of mobile eSports. The success of this whole new spectrum leads to the raises on the number of female participants. Unlike PC and console with a stigma of targeting male players, mobile as a platform attracts more female players than any other gaming devices, leading a very small difference among male players and female players (52% and 48%, respectively).

Murphy (2018), while examining the demographic features of eSports participants had discovered the age gap within audience target. His researched pointed out that most of participants were millennials (16-34 years old). The number of respondents above this age group dropped significantly, bearing similarity with the diminishing trend in traditional sport participants. In late 2018, Global Sport Matters also published their report about profile of US eSports fans with similar result with 75% of respondents were millennials, 15% were in the age group of 13-17 and only 10% were older than 34 years old. Despite setting the standard age for entering professional tournament at 17 years old, many young players have go-pro before reaching the minimum age requirement. Recent researches done by ESPN about the age group of eSport professional athletes suggests that eSports popularity is growing, however, such increase seems to exclusively among young generation.

4 RESEARCH METHODS

4.1 Theoretical approach

Earlier researches carried out in the field of sport economics attempted in estimating socio-patterns of sport demand have identified some key socio-economic variables that are important in determining participants preferences. As age, gender, race or ethnicity are considered the most important demographic determinants (Breuer, Hallmann, Wicker & Feiler, 2010); others like Hovemann & Wicker (2009) believed that education, occupation and relationship are equally important in determining frequency of sport participants. Apart from personal or internal factors, other external factors were also put under consideration. These external factors include the availability of sport programs, the condition of sport facilities, the spatial factors of the location or areas. In the scope of this thesis, some of the most popular determinants of demand for eSports will be examined. Unfortunately, due to the lack of mainstream figures, it is not possible to add macro factors like city size, infrastructure standard or population into the theoretical model.

Among previous mentioned factors, age is considered to have great influence on sport demand (Medic, Young & Starkes, 2009; Gratton & Taylor, 2002) as a negative correlation is often found in studies about age and sport participation. Some might explain for such negative correlation as age serves as an indicator of health status and physical condition. However, theoretically, since the present status of wellness does not strongly affect the ability of participating in eSports, a different result might be expected. Turning to gender, studies conducted in early 90s often described male as a predominant gender in sport. However, recent researches have shed some light on the matter, proving a new trend towards increasing number of females participating in sport (Barr, 2019; Breuer, Wicker & Hallmann, 2011). In a similar manner, recent studies on the field of competitive gaming show a positive outcome in attracting female participants. Next, educational level is also an important indicator for examining the frequency of consuming sport. A positive correlation – similar to the evidence found in sport determinant analysis is also expected.

Occupation, on the other hand, can be used to indicate both income and the amount of free time. This variable is used by assuming participants with a career get more income than those who don't and vice versa. In addition, those who are employed are less likely to have time for leisure activities compared to those who are unemployed. Speaking of time as a constraint, other variables indicating free time are relationship -as couples are presumed to not have as many times for leisure as single participants and student with similar assumption that they don't have redundant time to spare for sporting activities. By the same fashion, similar hypothesis can be applied to examine determinants of demand for electronic sports.

In short, in the upcoming parts, hypotheses about the affections of determinants of demand will be tested. As the purpose of this thesis is to make a comparative analysis, part of the hypotheses is based upon previous researches in the field of traditional sports. First, both age and gender are negative and statistically significant (Jost, 2009; Lopez & Garate, 2005, Gratton & Taylor (2002); Compass (1999). Second, income and education have positive correlations with electronic sports participation (Weber, 2006; Breuer & Schlesinger, 1995; Lopez & Garate, 2007). Third, long-standing illness is not statistically significant. Fourth, all variables indicate occupation and relationship status (student, fulltime employed, part-time employed, unemployed & relationship, single, married) are expected to have strong correlation. On the other hand, variables indicate race and ethnicity (Asian and another non-white) are not statistically significant.

4.2 Empirical specification

Taking a similar approach used in previous researches to analyse the determinants of demand in sport participation, a two-stage demand model will be used. The two-phase model used in analysing recreation activities has been used widely by sport economists (Brewer, 1969; Gratton & Taylor, 2002 and Phaneuf, 2019). This approach is highly recommended by allowing researchers to review both condition of sport participating and the intensity of the participations. In the first stage, the effect of determinants of demand on participation rate is explored, and in the second stage, the participation frequency is investigated.

The model is built upon the model used by Gratton & Taylor (2002) with the first stage attempts to examine the determinants of participating in electronic sports. In the second stage, elements affecting the frequency of participation will be analysed. The first stage will be presented in the first table “The determinants of PARTICIPATION” and the data represented the second phase will be given in the second table “The determinants of electronic sports INTENSITY”. Both tables will be featured by the same explanatory variables set. Inspired from previous research in sport economics, key determinants mentioned in theoretical approach will be included, they are age, income and gender. As debacle about legitimation of electronic sports go on, it would be beneficial to apply the same approach taken by sport economist to examine the potential similarities or differences among traditional sports and eSports. From that perspective, other variables regarding time as a constraint like occupation, student status, long-term illness, ethnicity will also be provided:

- Age: Age, in years
- Gender: Gender, Dummy, 1 = Female
- Education: Education, ranks from 1 to 4 with 1 = Secondary School, 2 = High School, 3 = College, 4 = Higher Education
- Long standing illness or disability: ILN, Dummy, 1 = Yes
- Income: Income, ranks from 1 to 4 with 1 = Under \$500, 2 = \$500 - \$2000, 3 = \$2000 - \$3000, 4 = \$3000 +
- Single: Single, Dummy, 1 = Yes
- In a relationship, Relationship, Dummy, 1 = Yes
- Asian: Asian, Dummy, 1 = Yes
- Non-white ethnicity: Non-white, Dummy, 1 = Yes
- Student: Student, Dummy, 1 = Yes
- Full time employed: Full-time Employed, Dummy, 1 = Yes
- Part time employed: Part-time Employed, Dummy, 1 = Yes
- Marital status: Married, Dummy, 1 = Yes
- The amount of participating in electronic sports in the last week: Participation Last Week, ranks from 1 to 4

The list above represents the variables featuring in two-phase model. The list contains several dummy variables such as ethnic groups, relationship status and work status. Note that variables belong to work status are separated due to their potentially affecting the level of income and free time availability. From that standpoint, relationship status is separated in different categories (single, in a relationship and married) and occupations are divided into full-time employed, part-time employed, unemployed and student. Gratton & Taylor (2002) believed that the key determinants of demand as age, gender and income might have influence the above variables, hence, they will be divided into subcategories. Different ethnicities and races are also included with separate variables are meant for those who belong to minority ethnicity groups like Asian and others non-white ethnicities. With prior researches in sport participations proving certain groups are less likely to participate in sport activities, the same assumption is adopted in this thesis.

4.3 Data collection method

To fulfil the purpose of gathering data on the determinants of demand for electronic sports, quantitative method is selected to fill the requirement. The data is collected by using convenience sampling method, an online survey was created and sent to different group of respondents. The survey was published online for twenty days from 15.03.2020 until 04.04.2020. Within the publishing time, the survey was posted to several social media channels including Facebook and Twitter, surveying websites such as Survey Circle and was sent to students within University of Oulu.

The survey included both multiple choice questions and rating scale questions to assure later comprehensive data analysis. The multiple choices questions were used to categorize different matters influencing on participating in eSports. They are questions about age, income, gender, ethnicity, current health status, and occupation. The rating scale is reserved exclusively for questions related to the frequency of participating in electronic sports. Due to the limited scope of the survey, the two activities are treated jointly, hence, participating activities could be either speculating or directly joining eSports games. These questions are put under rating scale to further analyse the intensity in joining of participants, which will be tested in the second phase of the model.

The size of the sample applied in this study was considered based on the requirements of Exploratory Factor Analysis EFA and multivariate regression analysis. By using previous theory in determining the appropriate sample size written by Tatham & Black (1998), the minimum sample size is 5 times the total number of observed variables. Comrey (1973) and Roger (2006) on choosing suitable sample size for research using factor analysis suggested the formula of $n = 5 * m$, where m is the number of questions in the survey. For multivariate regression analysis, the minimum sample size to be achieved is calculated by the formula of $n = 50 + 8 * m$ where m is the number of independent variables (Tabachnick & Fidell, 1996). In this case, m is the number of independent factors, not the number of independent questions.

Taking the above perspective, the survey is dedicated to stay online until enough respondents are gathered. In total, there are 807 respondents, among them, 801 are valid. There are 14 questions in the survey, 11 are compulsory and three are optional with 98% respondent rate. The result of the survey is then downloaded and extracted to Excel. Respondents with invalid answers are then eliminated, whereas blank optional answers are filled in with either the average or the most common factor appeared in the answer sheet. The answers are then transformed into numerical variables and are analysed using SPSS 25.0 software. The statistical method used is conventional regression analysis.

5 EMPIRICAL FINDINGS

Preliminary result of the survey shows that nearly 68% of respondents are male and roughly 32% are female. The majority of respondents are between 18-24 with 56.8%, which almost doubles the amount the second group of age 25-34 had. In total, respondents who are millennials accounted for roughly 90%, with the lowest belong to those who are under 18 years old. The ethnicity background is 83% White, 10.3% Asian, both Hispanic and Black origin are below 10%, they are later added to others minority group total to 7.1%. Corresponding to the majority of respondents age groups, most of answerers are high schoolers (39.7%), followed closely by those who are pursuing a higher degree – could be either masters or PhD degrees (32.8%). There is little difference in percentages among education groups as college comes third with only 7% less. One exception is those who are in secondary school with only 3.6%.

With 87.6% are full-time students, the most common range of income is between \$500 and \$2000 per month (42.5%), followed closely by under \$500 with 37.7%. Only 13.1% earns between \$2000 - \$3000 and around 6.6% earns more than \$3000. The chosen currency given in the survey is dollar, not euro due to fit the survey's aim of reaching a wider pool of candidates. Thus, dollar is chosen for being an international currency. With income ties strongly to occupation status, most of interviewees are unemployed (58%). 26.7% are working part time and only 16.8% are working full time. This result is predicted since to most of respondents are students. Hence the amount of time they have for their employment will somewhat be limited which would also the main indicator for low level of incomes.

Another factor corresponds to the average age range is relationship status with almost half of respondents are single. Among the other half, most are in a relationship (dating) and only around 8% are married. As for longstanding illness and disabilities, only 8.3% with prior illness conditions, the rest (91.7%) are in good health. Turning to the most important questions within the survey, 88.7% of total answerers have played or watched video games, the number was relatively lower when it comes to eSports (72%). Corresponding to positive the positive result in participation rate, in the scale of 5, almost 40% rate 5 as very often participating in

gaming, the scale of 4 – quite often comes second with 19%. On the other hand, rank scale for eSports shows a descend trend with scale 5 – very often is the least chosen. However, the result still meets previous prediction since participating in eSports requires different skill sets and the high level of competition might interfere with participant rate.

5.1 Results

Using SPSS, logistic regression analysis is conducted in the first phase. Due to differences revealed in preliminary results between participants in gaming and those who participate in eSports, two sets of data will be analyzed. The main idea is to showcase the differences among these two terms and as gaming and electronic sports are often perceived in a similar manner. Though competition are prominence feature in both terms, the criteria and skillsets required to participate in eSports are considered to at a higher level. Despite that, as eSports and gaming are closely related with one thrives on the other's succeed, it is also essential to compare determinants of demand of the two.

Table 3: The determinants of electronic sports participation

The determinants of electronic sports participation						
Explanatory Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Age	-1.197	0.171	48.894	1	0.00**	0.302
Gender	-2.143	0.205	109.132	1	0.00**	0.117
Long term illness and disability	0.268	0.349	0.591	1	0.442	1.307
Income	0.394	0.171	5.294	1	0.021*	1.483
Full-time Employed	-1.596	0.78	4.183	1	0.041*	0.203
Part-time employed	-0.437	0.8	0.298	1	0.585	0.646
Unemployed	0.199	0.837	0.056	1	0.812	1.22
Student	-0.802	0.353	5.153	1	0.023*	0.449
Education	0.255	0.117	4.779	1	0.029*	1.29
Asian	0.38	0.324	1.379	1	0.24	1.462
Non-white	0.627	0.384	2.662	1	0.103	1.871
Relationship	0.268	0.35	0.588	1	0.443	1.308
Single	0.211	0.354	0.355	1	0.551	1.234

* = 0.05 level of significance, ** = 0.01 level of significance, and *** = 0.001 level of significance.

The result for the first phase is presented in Table1. First, the regression analysis result presents multiple significant findings. Age, Gender, Income are statistically significant, matching with previous expectations. Age and Gender are both presented with negative sign, while Income is significant and positive. Beside the three main indicators, several variables represent time constraint and income naming Full-time employed and Student also have negative significant coefficients. Surprisingly, Fulltime Employed and Student are the only variable to have a significant impact on eSports participation. None of the variables indicating relationship status shows any substantial effect on participation rate. As predicted, Asian and Non-white also not statistically significant. Another positive significant variable that can be found in the

result is Education. Against previous assumption, longstanding illness and disabilities are not significant. Despite that, the result is also predicted.

Turning to second set of data, determinants of demand for gaming will be briefly mentioned in the Table 3. Note that the content of the table is shortened to rule out variables with no significant impact on participation rate. The result shows that only three among eleven independent variables are statistically significant. As Age and Gender are negatively affected the participation rate, none of other variables indicate time and income present any large impact. The most surprising factor is Relationship as it is the only variable other than Age and Gender has significant coefficient. Comparing the two results, it is clear that income and time are not constraint for participating in gaming activities. The result indicates a clear distinction between determinants of demand for gaming and for electronic sports. In fact, the outcome of the analysis for eSports demand are is comparatively similar to that of traditional sports.

The determinants of gaming participation						
	B	S.E.	Wald	df	Sig.	Exp(B)
Age	-0.541	0.194	7.816	1	0.005**	0.582
Gender	-2.277	0.279	66.543	1	0.00**	0.103
Relationship	0.955	0.431	4.919	1	0.027*	2.599

* = 0.05 level of significance, ** = 0.01 level of significance, and *** = 0.001 level of significance.

Table 4: The determinants of gaming participation

Similar to phase one, logistic regression is chosen to analyse the influences of socio-economic factors on electronic sports participation frequency in phase two. Concerning the potential effect of previous activities frequency, a slight change is made. A new variable – Participation Last Week is added to the dataset, the new

variable represents the number of times a respondent participated in electronic sports in the prior week.

Table 5: The determinants of electronic sports participation frequency

The determinants of electronic sports participation FREQUENCY						
	B	S.E.	Wald	df	Sig.	Exp(B)
Participation Last week	1.385	0.108	164.373	1	0.00**	3.996
Age	-0.429	0.181	5.62	1	0.018*	0.651
Gender	-1.006	0.233	18.679	1	0.00**	0.366
Long-term illness and disability	0.288	0.357	0.652	1	0.419	1.334
Income	0.356	0.176	4.081	1	0.043*	1.428
Full-time Employed	-3.065	1.195	6.581	1	0.01*	0.047
Part-time employed	-1.895	1.208	2.462	1	0.117	0.15
Unemployed	-1.672	1.228	1.856	1	0.173	0.188
Student	-0.446	0.35	1.628	1	0.202	0.64
Education	0.174	0.12	2.115	1	0.146	1.19
Asian	0.601	0.331	3.294	1	0.07	1.823
Non-white	0.126	0.392	0.103	1	0.748	1.134
Relationship	0.248	0.388	0.408	1	0.523	1.281
Single	0.3	0.387	0.599	1	0.439	1.35

* = 0.05 level of significance, ** = 0.01 level of significance, and *** = 0.001 level of significance.

The outcome of second phase is presented in Table 4. The result of the second phase reveals several significant findings as Age, Gender, Income, Full time Employed and Participation Last Week. Once again, Age, Gender and Full time Employed are negative and significant. Similarly, Income is positive and significant. Once again,

none of independent variables indicating relationship status or ethnicity has any impact on the outcome. Long term illness and disability continues to have no effect. The added variable – Participation Last Week showed a positive and strong coefficient. And as this variable is served as an indicator of eSports enthusiasm, the very high p-value implies the importance of it in predicting participation intensity. One noteworthy detail is that both Student and Education are no longer statistically significant. A possible explanation for the absence of these two variables is that they are already represented by other variables in the dataset, specifically Income and Full time Employed.

5.2 Main Findings

Starting with the result of the first model in analysing the impact of socio-economic determinants on electronic sports participation, the outcome is comparable to previous studies in the field of traditional sport. By bearing similarities to traditional sport, eSports are predominated by male and young participants. The demographic distribution of participants is presented in Table 5. As can be seen, the number of participants drop significantly aligning with the rising in age with majority of participants are millennials. And again, despite prior market research done hinting about the rise in number of female players, the result might suggest the opposite.

Table 6: eSports participation demographic distribution

eSports Demographic Distribution					
Participation	Under 18	18-24	25-34	35-44	45+
No		82	92	35	16
Male		27	36	10	7
Female		55	56	25	9
Yes	12	373	175	14	2
Male	10	292	148	12	2
Female	2	81	27	2	

Turning to variables indicating time as a constraint, namely Relationship, Married and Single, none of them poses any significant impact on the outcome, implying that relationship imply a nonsignificant effect on the time spent for this leisure activity. However, among those that depict both income and time limitation, two of them are statistically significant. The more likely respondent is either Student or Full-time Employed, the less likely they participated in electronic sports. It is certain that those who have a full-time job value their time and financial gain than participating in any leisure activities. However, the effect is not that clear in the case of respondents who are student. Taking a closer look, there is a close connection between occupation status and participation decision. Table 6 presents evidences regarding the participation decision of students, along with their occupation status. Even though 87.6% of eSports participations are students, however, majority of them are unemployed. And as the amount of participations who either have a part-time job or are full-time employed drop dramatically, students seem to value their jobs over participating in eSports. Note that the number of respondents vote Yes are slightly lower than those who vote No in case of having a part-time position. On the other hand, the number of non-participants with a full-time job is twice the number of participants. The result can be interpreted in two ways, first, those who are both students and hold a job have less time to spare. Second, their jobs bring financial value, and as they consider the trade-off between time for leisure and income, they are more likely to choose later.

Table 7: eSports participation and occupation

eSports Participation and Occupation			
Participation	Full-time Employed	Part-time Employed	Unemployed
No	54	130	87
Yes	26	116	365

Back to those with non-significant results, variables representing race and ethnicity and health condition have similar result, indicating the minimal role of the matter. As Unemployed and Part-time Employed also do not have statistically significant coefficients, it might due to the separation of occupation variable and their effect on

participation rate might be picked up by other variables like Income and Full-time Employed. As the negative and significant coefficients of Age, Gender, Student and Full-time Employed, and the positive outcome of Education and Income can be used to confirm some of our previous hypotheses. However, insignificant coefficients other variables had might point to rejection of some predictions. To re-examine assumptions provided in the theoretical approach, a list of hypotheses and its result is presented in the table 7.

Table 8: Hypotheses and results

Hypotheses	Result
Age is negative and statistically significant	Approved
Gender is negative and statistically significant	Approved
Income is positive and statistically significant	Approved
Education is statistically significant	Approved
Longstanding illness is statistically significant	Rejected
Relationship, Married and Single are statistically significant	Rejected
Asian and Non-white are not statistically significant	Approved
Student is statistically significant	Approved
Fulltime Employed is statistically significant	Approved
Part-time Employed is statistically significant	Rejected
Unemployed is statistically significant	Rejected

In the second phase of the model, Age, Gender and Income are proved to have great impact on the frequency of electronic sports participation. Young and male players continue to dominate eSports, both in participation rate and in frequency. The intensity of taking part in eSports is also bounded by time and income constraint. However, the limitation is not as strong as in the first case with Student leaving the chart. The only significant variable indicating occupation is Full-time Employed as respondents belong to this group are even less likely to join this leisure activity regularly. As work status also serves as the indicator for time availability, the prior expectation of them having significant effect on participation frequency is not met. And again, Long-term illness and disabilities, other race/ethnicity and relationship

status fail to have any considerable impact on the outcome. Education is also nonsignificant in this case, suggesting that the barrier of study status is lifted when an individual decide to participate in eSports. The new variable – Participation Last Week – can be used to estimate the current interest of respondent in eSports, thus, is very important in denoting the frequency of participation.

6 DISCUSSION, LIMITATION AND FUTURE RESEARCH

On analysing socio-economic determinants of electronic sports, the result of above quantitative research has shed some lights in the several issues. First, despite inherent stigma of gaming and eSports are interchangeable, from economic perspective, the determinants of demand effecting consumer consumption between the two are completely different. Interpreting the result, gaming is not bounded by income or occupation status. On an attempt to explain for this, a discrepancy between time spent for a gaming and a sport session might be the reason. A professional soccer match usually last 90 minutes, 2 hours for basketball and for football, a full game could last around 3 hours (Boss, 2013). Either participating or watching, the total amount of time an individual might spend for a full session is higher compare to the amount spend for gaming. By asking about the frequency, rather than time spent for each session, time might not serve as a constraint in this case. On the other hand, gaming is proved to have a wide participants pool by offering lots of different genres, with most of them are either free to play or at modest prices, plus, there are no auxiliary fees (infrastructure, transportation, membership...), income might not have a huge impact on consumer purchase ability.

However, the empirical result might suggest a contradistinction in case of eSports. Comparing the result with prior studies in the field of traditional sport, the impact of socio-economic determinants on demand of eSports are comparable to those in traditional sport. Eime et al., (2016), Breuer et al., (2011) pointed out descending trend in sport participation in different gender and age groups. Kamphuis et al., (2007) & Gratton et al. (2002) provided positive evidences on the effect of income and education on participation rate. By applying similar econometric model used by sport economists, the outcome of this research aligns with previous ones in the field of traditional sport. The result is an assertion for the strong connection between eSports and its counterpart. Chikish et al., (2019) has found a similar result of a positive correlation between participating in eSports activities and sport activities. Lee & Schhoenstedt (2011), on attempting to compare the consumption motives for eSports and traditional sport, have found a positive and significant results in five out of seven variables. Jaume & Murillo (2020) strengthen the argument by providing empirical evidences proving the positive and significant relationship between sport

computer games and traditional sport activities. Plus, with the distinction between eSports and gaming is clearly displayed, it's high time to reconsider the future scenarios mentioned in the previous part.

On analysing the intensity eSports participants, the evidences suggest that Age and Gender are continued to play important parts. The participation intensity is lower in female players and older players with majority of respondents who took part in eSports activities more than 3 times a week were male and players under 35 years old. The result is in line with previous market research in the field of electronic sports. For example, according to the report made by Neilson in 2017, seven out of ten eSports fans are male. Jaume & Morillo (2020), in a similar research, report the discrepancies in participation frequency in terms of age and gender. The effect of education, household size and personal status are also tested in their research. However, since the results are nonsignificant, the null hypotheses are rejected. Others, like being housewife or husband and nationality also do not have any big impact. On the other hand, location occupation and households with children are statistically significant.

First, the econometric model used in this thesis is adopted from previous research in the field of traditional sport (Cicchetti et al., 1969, Kalter & Gosse, 1970, and Gratton & Taylor, 2002). Despite being confirmed in terms of validity and reliability, the approach is outdated and might not be the best suit to analyse the determinants of demand for electronic sports. Secondly, by using conventional quantitative method, this research might suffer from several biases. Third, the size of the survey is rather small ($N = 801$). Next, due to the lack of mainstream data and literature for references, variable omitted bias might happen. Usually, in prior studies, sport economists often include variables indicating time, household size, with/without children, and location (rural/urban). And finally, in the process of cleaning data, the transformation and cleaning techniques might interfere with the result.

Over the past decade, esports has placed itself among top industries with its rapid growth. With its popularity, esports has attracted a number of researchers to study it in large scale. The first publication about esports is said to be in 2002 in analysing esports sociology factors, (Bryce & Rutter, 2002). From then, there has been an

uptick in the number of publications and books about this topic, especially from 2015 onwards. Each year, around 30 research publications in six fields were public, the trend continues and show a consistency in growth (Jason, Lee & Maria, 2019). However, research topic in the field of economics are rare. With many aspects have not been carefully examined, this thesis might serve as a call for further research. Future studies can look into the future impact of eSports or follow and apply prior studies in traditional sports in electronic sports industry at a larger scale.

7 CONCLUSION

eSports or electronic sports have experienced exponential growth in recent years in terms of generating revenue and expanding audience bases. In this thesis, the accelerated growth of eSports regarding revenue, investment and consumer recognition is reviewed. Next, the three scenarios suggested by Jonasson et al., (2010) are carefully examined. Among the three, the second scenario where eSports are recognized as part of the hegemony of sport is in favour. With electronic sport gradually being accepted as a real sport by numerous international organizations, and with the success of The International Esports Federation, electronic sports are being closer to reach the target.

In later part, eSports segmentation is then presented. The ecosystem of eSports is built base on the model created by created by Pitts, Fielding, and Miller (1994). As the main purpose of this thesis is to provide a comparative analysis on economic aspect between electronic sport and traditional sport, previous theories regarding the demand for the two are then revisited in literature review. Three main points that can be concluded is, first, eSports and traditional sports serve as a commodity. Second, despite some differences, they are both perceived as leisure activities and have time as a constraint. Third, to analyse factors effecting consumer demand for them, key socio-economic determinants are identified as age, gender and income.

To test the impact of determinants of demand and constraint on participation of eSports, a survey is created with the purpose of comparing the likeness and differences in demand for sports and for eSports. By using a two-phase econometric model used in numerous studies in the field of contemporary sport, the gathered data is then divided into two datasets, one is for analysing the impact on participation, the other is for analysing the frequency of participation. The result for the first phase bears some similarities to prior studies with age and gender are negative and significant. Meaning that both sport and eSports are dominated by young and male players. Secondly, income is positive and significant, confirming the income-effect theory. Even though not all variables indicating time as a constraint are significant, the result is closely match with previous expectation.

Turning to the second phase, the frequency of eSports participation is also under influenced of age, gender and income. However, most of variables serve as indicator for time as a constraint have no longer have significant impact on the outcome. Apparently, participants with strong participation rate, especially those who participated more than three times in the previous weeks, are not bounded by time anymore. Two noteworthy points that can be drawn from the result is that long-term illness and disabilities are nonsignificant in participating in eSports. This is understandable since participating in eSports do not require physical attributes like in traditional sport. Secondly, the result for demand of gaming is different in terms of income and time serving as constraints. Such distinctive difference is used as an indicator that gaming and eSports are not identical. In fact, the result in this thesis suggests that regrading consumer demand, eSports are more similar to tradition sport than to gaming. However, with limitations and lack of mainstream data, further studies are necessary.

8 REFERENCES

- Alonzo, D. (2017). How streaming is taking esports to the big leagues. *Venture Beat*. Retrieved from <https://venturebeat.com/2017/08/19/how-streaming-is-taking-esports-to-the-big-leagues/> .
- Ayodele, S. (2019). eSports vs Gaming: What's the difference? *Taylor Strategy*. Retrieved from <https://taylorstrategy.com/esports-vs-gaming-whats-difference/>
- Barr, S. (2019). Gender Gap in Sport Between Active Women and Men Narrows By More Than 90,000. *Independent*. Retrieved from <https://www.independent.co.uk/life-style/women/gender-gap-active-women-men-sport-england-survey-exercise-fitness-a8866596.html>.
- Blosat, G. (2019). Non-Endemic Brands In Esports: How Riot Games Helped Push Three Companies Over The Top In Sponsorship Marketing. *Zoomph*. Retrieved from <https://zoomph.com/blog/non-endemic-brands-in-esports-how-riot-games-helped-push-three-companies-over-the-top-in-sponsorship-marketing/>
- Borland, J & Macdonald, R. (2003). Demand for Sport. *Oxford Review of Economic Policy*, VOL.19, NO.4. Retrieved from <https://doi.org/10.1093/oxrep/19.4.478> .
- Brathwaite, B. (2018). Breaking Down the Major Streaming Platforms in Esports. *Esports Observer*. Retrieved from <https://esportsobserver.com/breakdown-streaming-platforms/>.
- Breuer, C., Hallmann, K & Wicker, P., Feiler, S. (2010). Socio-economic patterns of sport demand and ageing. *European Group for Research into Elderly and Physical Activity*. doi: 10.1007/s11556-010-0066-5.
- Cao, J (2007). Gender Role-Based Differences in Time Allocation: Case Study of Shenzhen, China. *Research Gate*. doi: 10.3141/2014-08.

Carreras, M & Garci, J. (2019). eSports: A New Era for the Sports Industry and a New Impulse for the Research in Sports (and) Economics? *Research Gate*. Retrieved from <https://www.researchgate.net/publication/332781901>.

Deaner, O. R & Balish, M. S. (2015). Sex Differences in Sports Interest and Motivation: An Evolutionary Perspective. *American Psychological Associations*, Vol. 10, No. 2, 73–97. doi:/10.1037/ebs0000049.

Deloitte Corporate Finance LLC. (2019). *The rise of eSports investments*. Retrieved from <https://www2.deloitte.com/us/en/pages/advisory/articles/the-rise-of-esports-investments.html> .

Eime, M. R., Harvey, T. J & Charity, J. M. (2016). Age profiles of sport participants. *US National Library of Medicine*. doi: 10.1186/s13102-016-0031-3.

Elchison, S. (2019). The Difference Between Esports & Gaming. *Medium*. Retrieved from <https://medium.com/ipg-media-lab/the-difference-between-esports-gaming-3bcb2d45d42b>.

García, J. and Murillo, C. (2020), "Sports video games participation: what can we learn for esports?". *Sport, Business and Management*, Vol. 10 No. 2, pp. 169-185. <https://doi.org/10.1108/SBM-01-2019-0006>.

Gratton, C & Taylor, P. (2000). *Economics of Sport and Recreation*. New York, Spon Press.

Global Sport Matters. *New report shows esports audience becoming more diverse*. Retrieved from <https://globalsportmatters.com/business/2018/06/26/report-shows-esports-audience-becoming-more-diverse/>.

Hamari, J & Sjöblom, M. (2019). What is eSports and why do people watch it? *Research Gate*. doi: 10.1108/IntR-04-2016-0085.

Heale, R & Twycross, A. (2015). Validity and reliability in quantitative research. *Research Gate*, volume 18, number 3. doi: 10.1136/eb-2015-102129.

Hilbert, J. (2019). Gaming & gender: how inclusive are eSports? *Sports Integrity Initiative*. Retrieved from <https://www.sportsintegrityinitiative.com/gaming-gender-how-inclusive-are-esports/>

International Esports Federation. *About IESF*. Retrieved from <https://ie-sf.org/about>.

Jayan, M. M & Mathew, H. P. (2015). Brand Preference towards Sports Apparels. *International Journal of Multidisciplinary Research and Development*, Volume: 2, Issue: 9, 316-318. e-ISSN: 2349-4182.

Jonasson, K. (2010). Electronic sport and its impact on future sport. *Research Gate*, Vol. 13, No. 2. doi: 10.1080/17430430903522996.

Kamphuis, C. (2010). Socio-economic status, social capital and sports participation. *The European Journal of Public Health*. doi: 10.1249/mss.0b013e318158e467.

Karhulahti, V. (2017). Reconsidering Esport: Economics and Executive Ownership. *Research Gate*. doi: 10.1515/pecssr-2017-0010.

Kluger, J. (2016). The Scientific Reason Men Like Sports More Than Women. *Time*. Retrieved from <https://time.com/4322947/men-women-sports-evolution/>.

KPMG. (2017). *The economic impact of major sport events*. Retrieved from <https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2018/09/the-economic-impact-of-major-sports-events.pdf>

Larch, F. (2019). The History of the Origin of eSports. *ISPO*. Retrieved from <https://www.ispo.com/en/markets/history-origin-esports>.

Lee, D & Schoenstedt, J. L. (2011). Comparison of eSports and Traditional Sports Consumption Motives. *Journal of Research*, Volume 6, Issue 2. ISSN-1930-4595.

Limelights Network. *State of Online Gaming Report*. Retrieved from <https://www.limelight.com/resources/white-paper/state-of-online-gaming-2019/>

Maennig, W. (2017). Major Sports Events: Economic Impact. *Research Gate*. doi: 10.2139/ssrn.2990262.

Mageloja, E. (2019). Economics of Esports. *Electronic Journal of Business Ethics and Organization Studies*, Vol. 24, No. 2. Retrieved from http://ejbo.jyu.fi/pdf/ejbo_vol24_no2_pages_34-42.pdf.

Matulevich, R. E., Viollaz, M & Walsh, C. (2019). Time after time: How men and women spend their time and what it means for individual and household poverty and wellbeing. *World Bank*. Retrieved from <https://blogs.worldbank.org/opendata/time-after-time-how-men-and-women-spend-their-time-and-what-it-means-individual-and>

Murphy, D. (2018). Esports: The Future Audience That Is Already Here. *Entsight*. Retrieved from <https://entsight.com/blog/esports-the-future-audience-that-is-already-here>.

Murphy, M. (2018). The gender play gap: why aren't more women playing sport? *RTE*. Retrieved from <https://www.rte.ie/brainstorm/2017/1129/923613-the-gender-play-gap-why-arent-more-women-playing-sport/>.

Newzoo. *Male and Female Gamers: How Their Similarities and Differences Shape the Games Market*. Retrieved from <https://newzoo.com/insights/articles/male-and-female-gamers-how-their-similarities-and-differences-shape-the-games-market/>.

Nordmark, S & Heath, J. (2019). The top 10 highest prize pools in esports. *Dot Esports*. Retrieved from <https://dotesports.com/general/news/biggest-prize-pools-esports-14605>

Opolska, I & Proskina, L. (2017). *Sports role in Economics*. International Economics Conference. Retrieved from

https://lufb.llu.lv/conference/economic_science_rural/2017/Latvia_ESRD_45_2017-322-329.pdf .

Pannekeet, J. (2019). Newzoo's Esports Consumer Predictions for 2021: A Quarter of the World's Population Will Be Aware of Esports. *Newzoo*. Retrieved from <https://newzoo.com/insights/articles/newzoos-esports-consumer-predictions-for-2021-a-quarter-of-the-worlds-population-will-be-aware-of-esports/>

Pitts, B. (1994). Industry segmentation theory and the sport industry: Developing a sport industry segment model. *Research Gate*, Volume III, NO. 1.

Rad, A. M., Ganjouei, A, F & Hazaveb, S. H. (2014). An Investigation of Macro and Micro Factors Affecting Sport Participation in Tehran Citizens, Iran. *Research Journal of Recent Sciences*, Vol. 3(12), 138-146.

Radicchi, E. (2014). Sports Sponsorship Evolution in the Economic Recession: Analytical Evidence from Empirical Cases. *Physical Culture and Sport*. doi: 10.2478/pcssr-2014-0005

Reitman, G. J., Lee, S. J & Anderson-Coto, M. J. (2019). Esports Research: A Literature Review. *Research Gate*. doi: 10.1177/1555412019840892.

Reyes, S. M. (2019). Esports Ecosystem Report 2020. *Business Insider*. Retrieved from <https://www.businessinsider.com/esports-ecosystem-market-report?r=US&IR=T>

Ruseski, E. J., Humphreys, R. B., Hallmann, K & Breuer, C. (2011). Family structure, time constraints, and sport participation. Biomed Centre. doi: 10.1007/s11556-011-0084-y.

Siwek, E. S. (2017). *Video games in the 21st century the 2017 report*. The entertainment software association. Retrieved from <https://www.theesa.com/wp-content/uploads/2019/03/2017-EIR-National-Report.pdf>.

Sloun, V. S. (2018). Esports Franchise Economics. *Loup Ventures*. Retrieved from <https://loupventures.com/esports-franchise-economics/>.

Sports Econ Austria. (2012). *Study on the Contribution of Sport to Economic Growth and Employment in the EU*. Retrieved from <https://ec.europa.eu/assets/eac/sport/library/studies/study-contribution-sports-economic-growth-final-rpt.pdf>.

Takahashi, D. (2016). Women make up 30% of esports audience, up 6.5% from 2016. *Venture Beat*. Retrieved from <https://venturebeat.com/2019/02/21/interpret-female-esports-viewership-grew-6-5-percentage-points-over-two-years/>.

Thorne, R. (2015). Economic impact of sporting events. *Independent*. Retrieved from <https://www.independent.co.uk/student/shu/economic-impact-of-sporting-events-10260570.html>

Vamplew, W. (2019). The Commodification of Sport: Exploring the Nature of the Sports Product. *Research Gate*. doi 10.1080/09523367.2018.1481832.

Warman. P. (2015). *The eSports Economy*. Newzoo. Retrieved from https://www.igamingbusiness.com/sites/default/files/Newzoo_eSports_iGaming_Webinar.pdf.

Zarrabi, A. S & Jerkrot, N. H. (2016). Value creation and appropriation in the esports industry. Retrieved from <http://publications.lib.chalmers.se/records/fulltext/238371/238371.pdf>.