

**2021 09 Aalto EMBA**

**A study on the “Play-to-Earn” business  
model in gaming**

**Sung, Juhyun**

**December 2022**

**2021 09 Aalto EMBA**

# 게임 산업에서 “Play-to-Earn” 에 대한 연구

성 주 현

**December 2022**

## Executive Summary (English)

Gaming has been a big thing since the start of personal computing and the mass production of home video game consoles. Many different types of business models have been introduced. At first, the logic was simple. Develop a game, release it and the customers purchase the package. That was it. Just like selling music records or movie titles, game titles were sold in the same way. This changed with the introduction of fast-speed internet. The online gaming market began to evolve and diverse business models were introduced. One of the biggest changes was the free-to-play games. As the name represents itself, players could play games for free of charge but had to watch advertisements to continue to play or had to purchase skills, skins, or other items to play the game properly. This change in the online gaming industry expanded the gaming market by a big step. Many successful gaming companies became entertainment giants and now are the leaders in the entertainment industry. Many people believe that gaming is the future of entertainment. From movies to webtoons and esports, the gaming industry is expanding in every way, bigger than ever. Recently, the next momentum in the gaming industry came with the popularity of blockchain technology. Blockchain technology introduced many different types of cryptocurrency which are considered profitable assets. Just like the stock market, cryptocurrency can be listed in the trading market and traders are free to trade them. A multiple number of gaming companies are developing blockchain games where players can either acquire cryptocurrency as they play the game, or exchange in-game currency for cryptocurrency. This changed the paradigm of gaming as in the past the players had to spend their money to participate in the gameplay, but now with blockchain gaming, players can make a profit out of playing games. This business term is called the “Play-to-Earn(play-to-earn)” model. “Play-to-Earn” has become popular, especially in developing markets. However, in markets like South Korea, this type of business model is illegal. This is because, under the current law, the Game Management Committee of South Korea prohibits the conversion of in-game assets into cash on the grounds of speculative concerns. In this business project, I want to study the possibility of play-to-earn games and how we can expand this business model in gaming. Also, explain why it should not be restricted.

Key Words: Play-to-Earn (P2E), Non Fungible Token (NFT), Digital Asset, Game Regulations

## Executive Summary (Korean)

게임은 개인용 컴퓨팅과 가정용 비디오 게임 콘솔의 대량 생산이 시작된 이래로 매우 빠르게 발전을 해왔다. 가파른 발전과 더불어 다양한 유형의 비즈니스 모델이 도입되었다. 초기 판매 모델은 무척이나 간단했다. 게임 개발사에서 게임을 개발하고 출시하면 고객이 패키지를 구매하여 플레이 하곤 했다. 그 외에 특별한 수익 발생 모델은 없었다. 아주 간혹 가다 게임 캐릭터 인형을 판매한다던 지 영화화 되는 경우는 있었지만, 매우 드문 케이스였다. 즉, 음반이나 영화를 판매하는 것과 마찬가지로 게임 타이틀도 같은 방식으로 판매되었다. 그러다 게임 비즈니스 모델은 초고속 인터넷의 도입으로 상당히 큰 변화를 맞이했다. 온라인 게임 시장은 진화하기 시작했고 다양한 비즈니스 모델이 도입되었다. 가장 큰 변화 중 하나는 무료로 플레이를 가능하게 한 게임이었다. 이름에서 알 수 있듯 플레이어는 무료로 게임을 할 수 있었지만 게임을 지속해서 플레이 하기 위해서는 광고를 시청해야 한다던 지 아니면 스킨, 스킨 또는 기타 아이템을 구매해야 했다. 이는 스마트폰의 폭발적인 보급과 함께 성장한 모바일 게임 시장에서는 가장 대중적인 비즈니스 모델로 자리잡게 됐다. 온라인 게임 산업의 이러한 변화는 게임 시장을 크게 확대했다. 많은 성공적인 게임 회사들이 엔터테인먼트계의 거대 공룡이 되었고 이제 엔터테인먼트 산업의 리더가 되었다. 많은 사람들은 게임이 엔터테인먼트의 미래라고 믿는다. 영화에서 웹툰, e 스포츠에 이르기까지 게임 산업은 모든 면에서 그 어느 때보다 크게 확장되고 있다. 최근 게임 산업의 다음 모멘텀은 블록체인 기술의 대중화와 함께 찾아왔다. 블록체인 기술은 수익성 있는 자산으로 간주되는 다양한 유형의 암호화폐를 도입했다. 주식 시장과 마찬가지로 암호화폐는 거래 시장에 상장될 수 있으며 거래자는 자유롭게 거래할 수 있다. 여러 게임 회사에서 플레이어가 게임을 플레이하면서 암호화폐를 획득하거나 게임 내 통화를 암호화폐로 교환할 수 있는 블록체인 게임을 개발하고 있다. 이는 과거 플레이어가 게임에 참여하기 위해 돈을 써야 했던 것과 같이 게임의 패러다임을 변화시켰지만, 이제는 블록체인 게임을 통해 플레이어가 게임을 통해 수익을 올릴 수 있다. 이 비즈니스 용어를 "Play-to-Earn(play-to-earn)" 모델이라고 한다. "Play-to-Earn"은 특히 개발도상국 시장에서 큰 인기를 얻었다. 그러나 한국과 같은 시장에서는 이러한 유형의 비즈니스 모델이 불법으로 간주된다. 현행법상 한국 게임관리위원회가 투기적 우려를 이유로 게임 내 자산을 현금화하는 것을 금지하고 있기 때문이다.

블록체인 게임에는 단순히 암호화폐만 얻어 수익을 내는 것은 아니다. 최근 몇 년 사이 선풍적인 인기를 끌고온 NFT도 하나의 수익 모델 중 하나다. NFT는 'non-fungible token'의 약자로, '대체 불가 토큰' 혹은 '대체 불가능 토큰'으로 해석된다. 대체가능(fungible)한 토큰들은 각기 동일한 가치와 기능을 갖지만, 서로 교환이 가능하며, 동일 단위의 1:1 교환이 발생할 경우 사실상 교환이 발생하지 않았던 것과 다름이 없다. 명목화폐, 비트 코인 · 이더리움 등의 통상적 암호화폐, 귀금속, 채권 등이 이에 해당된다. 반면 대체불가능(non-fungible)한 토큰들은 각기 고유성을 지니게 된다. 발권 자, 비행 편, 좌석위치 등이 전부 특정되어 있으므로 동일품이 아예 존재할 수 없다. NFT는 암호화된 거래내역을 블록체인에 영구적으로 남김으로써 고유성 역시 보장받는다. 아무나 복제할 수 있는 '디지털 파일'에 대해서도 '고유 소유권'을 발행하는 데에 사용될 수 있는 기술이다.

NFT 기술을 게임에 어떻게 활용을 할까? 게임 속 아이템에 NFT 기술을 도입하여 이더리움이나 도지 코인 등 가상화폐로 환전할 수 있게 하는 기술이다. 대표적으로 한국의 게임 제작사 위메이드의 미르 4라는 게임을 예로 들겠다. 해당 게임에서는 게임 내 자산인 흑철을 NFT화 하여 이것을 현금으로 환전이 가능하게 했다. 게임내 자산을 NFT화 했기 때문에 복제가 불가능하며 고유성을 갖게 되기에 현재의 기초 통화국들이 하는 것 처럼 무한정으로 게임 제작사가 흑철을 찍어내어 통화 가치를 하락 시키거나 하는 행위가 원천적으로 불가능하다. 그렇기에 그 가치를 인정받을 수 있고, 그것이 지니는 가치에 따라 주식처럼 거래가 이뤄지는 것이며 나아가 매매를 통해 현금화도 가능하게 되는 것이다.

한국은 전통적으로 온라인 게임 강국 중 하나다. 과거 패키지 게임 시절에는 그러지 못했으나, 급속도로 인터넷이 보급되며 세계 최초의 대규모 다중 사용자 온라인 롤플레이 게임인 바람의 나라를 시작으로 리니지 등 다양한 성공적인 온라인 게임을 만들어냈고 이는 오늘날에까지 이어지고 있다. 세계 최대 규모의 게임 플랫폼인 스팀 최대 동시 접속자 기록과 모바일 게임 통틀어 최대 매출을 기록하고 있는 게임은 각각 크래프톤사의 배틀그라운드와 동사의 IP를 활용한 배틀그라운드 모바일인 점은 한국의 게임 회사들이 온라인 영역에서 얼마나 강력한 힘을 보여주고 있는지를 나타내는 명백한 증거다.

급변하는 이 시대에, 하루가 멀다 하고 변하는 IT, 그것도 게임 시장에서 한국이 NFT 게임을 대하는 자세는 어떠할까? 앞서 언급한대로 현행법상 한국 게임관리위원회가 투기적 우려를 이유로 게임 내 자산을 현금화하는 것을 금지하고 있어서 한국에서는 관련한 게임을 출시 조차 못 하고 있다. 절대적 권력을 지닌 게임관리위원회가 심의 통과를 허락해주지 않고 있기 때문이다.

하지만 현재의 P2E 게임에 대한 사행성 우려는 지나치다. 국어사전에서 사행성은 우연한 이익을 얻고자 요행을 바라거나 노리는 성질이라고 정의하고 있다. 하지만, 여러차례 언급했듯 P2E 게임을 통해 게임 내 재화를 얻는 것은 요행을 통해 가능한 행위가 아니다. 플레이어는 반드시 게임 내 규칙대로 특정한 임무를 수행해야 하고 수행 성취도에 따라 그에 맞는 보상을 지급받게 되기 때문이다. 게임 내 임무를 예를 들면, 몬스터 10 마리 잡기 혹은 다른 마을의 A라는 사람을 찾아가서 물건 전달하기 등의 직접적인 플레이어의 순수 노동이 필요한 임무다. 그 어떠한 경우에도 이러한 게임들 에는 사행성을 띄는 임무는 없다. 게임 스토리와 세계관에 어울리지 않기 때문이다.

오히려 사행성을 얘기하려면 기존에 이미 여러 게임에서 활용중인 가차 시스템이 더 사행성을 조장 및 유발하는 위험한 비즈니스 모델이라고 할 수 있다.

여기서 가장 큰 문제가 되는 부분이 원하는 상품을 반드시 얻는다는 보장이 없다는 것이다. 예를 들어, 일정 금액의 돈을 투자하여 랜덤 아이템을 샀는데 플레이어가 얻기를 희망하는 아이템이 나올 확률은 우리가 토요일마다 번호 6개를 맞춰보는 로또보다도 낮을 수 있으며 그 확률조차 공개하지 않는 경우가 많다는 것이다. 이러한 비즈니스 모델은 허용이 되는데 정당한 노동의 대가를 통해 얻는 게임 내 NFT 재화를 사행성으로 치부하기에는 무리라는 것이다.

P2E 게임의 원조를 돌아보면 2015년 Etheria(이테리아)라는 게임이 있다. 게임 내 부동산을 NFT로 구매가 가능한 방식이었다. 출시 초기에는 큰 관심을 받지 못했고 첫 P2E 게임이라는 타이틀만 있었을 뿐이다. 그후 2017년 북미의 캐나다의 개발사가 출시한 Cryptokitties(크립토키티즈)라는 게임이 있다. 게임 내에서 고양이 캐릭터를 키워 가상화폐로 거래할 수 있었다. 이때 당시만해도 P2E 게임이 일반인들의 생계 수단이 될 수 있을 것이란 생각을 하는 사람들은 많지 않았다.

베트남의 Axie Infinity(엑시 인피니티)라는 타이틀은 play-to-earn 비즈니스 모델을 제대로 시장에 안착 시킨 대표작으로 평가받고 있다. 게임 내 캐릭터를 교배하여 신규 캐릭터가 생성되면 NFT화 하여 추후 암호화 화폐인 ETH로 매각을 할 수 있다. 선풍적인 인기를 끌면서 소득 수준이 낮은 개발도상국가에서는 젊은 세대에서 선풍적인 인기를 이끌며 2021년 3월에는 일일 활성 사용자(DAU)수가 2만명에 불과했으나 같은 해 12월에는 250만명을 훌쩍 뛰어넘으며 놀라운 성장세를 보이기도 했다. NFT 거래량 측면에서도 2021년 3분기 106억 USD의 거래량을 보이며 전체 NFT 거래량의 20%를 차지하기도 했다. 게임을 충분히 플레이 후 현금화 시 월 100만원 가량의 수익이 발생하게 되는데 베트남, 필리핀 등 젊은 층 평균 근로소득의 몇 배는 되는 고소득이기에 많은 플레이어들이 모일 수 있었다는 분석이다.

이처럼 무궁무진해 보이는 차세대 게임 비즈니스 모델인 play-to-earn 관련한 국내 법규는 특별한 게 없다. 단지 게임물관리위원회에서 사행성을 이유로 금지만 하고 있을 뿐.

대표적인 예가 한국 시장에 최초로 선보였던 play-to-earn 게임인 무한돌파삼국지 리버스다. 출시 이후 모니터링에 적발되어 서비스를 종료해야하는 아픔이 있다. 그 후 한국 시장에는 단 한개의 play-to-earn 게임이 출시되지 못하고 있다.

2022년 대선이 치뤄지고 정권이 바뀔에 따라 그 어느때 보다 규제 완화에 대한 기대가 커졌다. 다음은 윤석열 및 안철수 당시 대통령 후보가 내세웠던 게임 산업 관련 공약이다.

- 확률형 아이템 정보 완전 공개와 국민의 직접 감시
- 일정 규모 이상 게임사에 이용자위원회 구성 및 제재 수위 법률로 규정
- 게임 소액 사기 전담 수사 기구 설치
- e스포츠 산업 발전 위한 경기장 설립 및 지역 연고제 도입
- 장애인 게임 접근성 불편 해소
- 온라인 게임 본인 인증 절차 개선
- 게임 이용장애 반대
- play-to-earn, NFT 신중 검토 및 해외 추이에 따라 결정

윤석열, 안철수 두 후보가 모두 규제 완화냐, 강화냐 등의 구체적인 입장을 보이지는 않았다. 하지만, 무조건적인 규제 대신 소비자 권인 보호를 최우선하고 해외 사례를 1년 정도 지켜본 후 설사 부정적인 측면이 많더라도 좋은 쪽으로 개선해보자는 입장을 보였다. 과거 한국 게임 시장은 바다이야기라는 시련을 겪었다. 당시에는 상품권을 통해 음지에서 양지로 끌어내자는 취지로 시작했지만 결국은 도박장으로 전락했다. 그렇기에 아직도 많은 전문가들은 그때의 광기를 두려워하며 규제 완화를 망설인다.

다른 전문가들은 play-to-earn은 요즘 화두인 메타버스, 블록체인 및 NFT 기술 등 4차 산업혁명 시대의 융합기술이라며 게임뿐 아니라 모든 산업, 문화와 관계되는 기술인데 이를 규제만 한다면 국가적으로 큰 손실이라 진단한다.

Play-to-earn 게임이 갖는 한계도 명확하다. 이용자 수가 많아 게임내 NFT나 재화의 가치가 높을 때는 초기에 플레이어들이 투자한 비용을 회수하고도 일정 수익을 낼 만큼 건강하게 시장이 흘러가지만, 인기가 떨어져 이용자수가 감소한다면 그만큼 게임내 재화의 가치도 떨어지기 마련이다. 또한, 게임내 재화와 연계된 암호화폐의 가치 하락 등 재화의 가치가 실시간으로 변하기에 여러 측면에서 리스크 관리에 신중할 필요가 있다.

금전적인 측면의 한계점만 있는 것이 아니다. 지금은 이제 막 태동 단계의 시장으로서 여러 게임 개발사들이 홍보에 열을 올리고 있지만, 게임 자체로서의 게임성에 대해서는 여러 의문이 남는다. 심지어 기존의 게임 주이용층은 지금까지 출시된 play-to-earn 게임들에 크게 관심도 갖지 않으며 오히려 부정적인 시선으로 바라보고 있다. 게임이란 종합 엔터테인먼트의 결과물과 같은데 단순히 돈을 벌기 위한 수단으로 전락한 play-to-earn 게임들은 스토리, 재미, 그래픽 등 게임 완성도 측면에서는 기존의 웹메이드 게임들과는 비교조차 하기 민망할 정도의 수준이기 때문이다.

나아가 play-to-earn 비즈니스 모델의 지속 가능성에 대한 의문도 아직 해결되지 않았다. 누군가가 돈을 번다면 그 돈은 다른 누군가의 주머니에서 나와야 하는 것이 정상인데, 결국 도박시장 처럼 누군가는 돈을 벌겠지만 대다수의 인원은 돈을 잃을 수 밖에 없는 구조일 수 있다는 우려는 반드시 해소되어야 하는 부분이기도 하다. 대부분의 게임들이 초기에 시작 시에 투자를 하여 캐릭터를 키우는 것부터 시작하는데 먼저 게임을 시작한 사람의 수익을 나중에 게임을 시작한 사람들의 돈으로 메꿔주는 시스템이기 때문이다.

이 비즈니스 프로젝트에서 본인은 play-to-earn 게임의 가능성과 이 비즈니스 모델을 게임에서 어떻게 확장할 수 있는지 탐구하고 싶다. 하지만, 그 전에 현재의 게임 내 확률형 아이템의 사행성에 대한 실태 및 그로인한 문제와 해외에서의 P2E 게임 운영 및 성공 사례를 분석하여 국내 시장에 성공적으로 안착 시킬 수 있는 방법 또한 알아보겠다. 그리고 위에 서술한 여러 우려에도 불구하고 무조건적으로 제한 및 규제만해서는 안 되는 이유를 더욱 설명하겠다.

# Table of Contents

I.	<a href="#">Introduction</a>	9
1.	Research Motivation	9
2.	Why P2E is Important	11
3.	Research Methods	12
II.	<a href="#">Play-to-Earn Game</a>	13
1.	Overview	13
2.	Concepts and Definitions	13
3.	Play-to-Earn Games in South Korea	15
i.	History	15
ii.	Limitations and Challenges	18
iii.	Changes	20
III.	<a href="#">Case Study</a>	22
1.	History of Axie Infinity	22
2.	Limitations and Challenges	22
3.	Discussion	23
IV.	<a href="#">Strategic Control &amp; Conslusions</a>	26
1.	Road to Success	26
2.	Conclusions	29
V.	<a href="#">Thanks to</a>	30
VI.	<a href="#">References</a>	31

## List of Figures

<Figure 1> Korean Gaming Companies and Employees -----	10
<Figure 2> Korean Gaming Industry Revenue and Exports -----	11
<Figure 3> Stock Price of WeMade From July 26 to October 26 -----	18
<Figure 4> Bitcoin Price for Past Five Years -----	22
<Figure 5> Marriage and Birth Rate -----	27



# I. Introduction

## 1. Research Motivation

My personal experience working in the gaming industry has made me study more about the new business model, “Play-to-Earn(play-to-earn)”. It sounded like a whole new world to me as I have never thought making a profit from playing games could be possible. To be exact, making a profit from playing online games is possible in a different way. For example, in MMORPG, you could level up your character and sell your character to other players. This is possible because leveling up takes time and players who want to save time but have a high-level character buys characters from other people. As you might guess, trading accounts are not officially supported by game companies.

Another way to make a profit is to trade in-game items such as swords, shields, and skins. Some in-game items become very rare and the demand goes up. Players trade items for real currency and many players make a profit out of it. Again, this kind of trading is not officially supported by gaming companies.

Play-to-earn (play-to-earn) games refer to the concept of gaming in which a platform provides its players with a chance to earn any form of in-game assets that can be transferred to the real world as a valuable resource. In other words, it is officially supported by the gaming developer for players to make money from playing their games. It effectively gives players a chance to generate revenue by participating in games. Players create value for other gamers and developers by engaging in the in-game ecosystem and earning assets for their contributions.

These digital assets might range from coins to accessories that have been tokenized on the blockchain. As a result, the play-to-earn business model pairs nicely with blockchain games. It is still very hard to believe, but play-to-earn games, like Axie Infinity, are already helping players around the world earn a great amount of money. According to an estimate, people in the Philippines are earning \$1,500-\$2,000 a month<sup>1</sup> just by playing Axie Infinity as a hobby. Many people in Vietnam have also quit their full-time jobs as they are earning a handsome sum of money from these games.

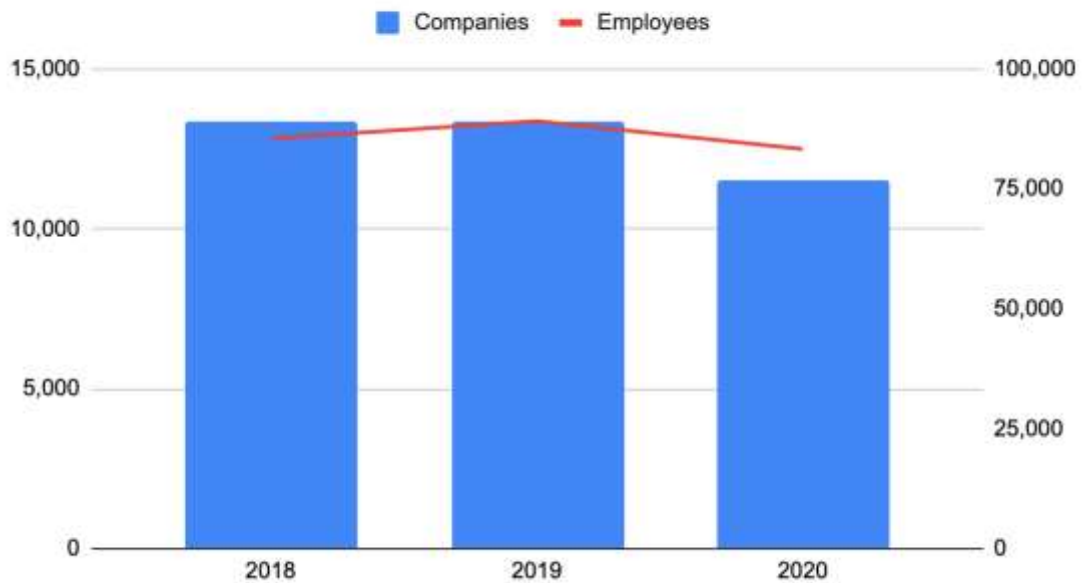
Another reason why these regulations have to be removed is that the gaming industry generates lots of good jobs. South Korea’s employment rate is declining especially among the younger generation. The various regulations applied to the game market will inhibit the growth of the game industry. In addition, it has a negative effect on total employment.

Game use regulations limit the time and frequency of game use. Restriction on transactions between ‘game user products’ and ‘game content products’. It acts as a factor limiting the growth of the game industry. In the domestic game industry, despite the growth of the mobile game market, the effect of increasing total sales and increasing employment decreased. Although the game has shown a high market growth rate so far in the domestic content industry, the industry has recently been showing signs of slowing growth, and employment has turned to a declining trend.

---

<sup>1</sup> <https://restofworld.org/2021/axie-infinity/>

## Korean Gaming Companies and Employees



<Figure 1> Number of South Korean gaming companies and employees

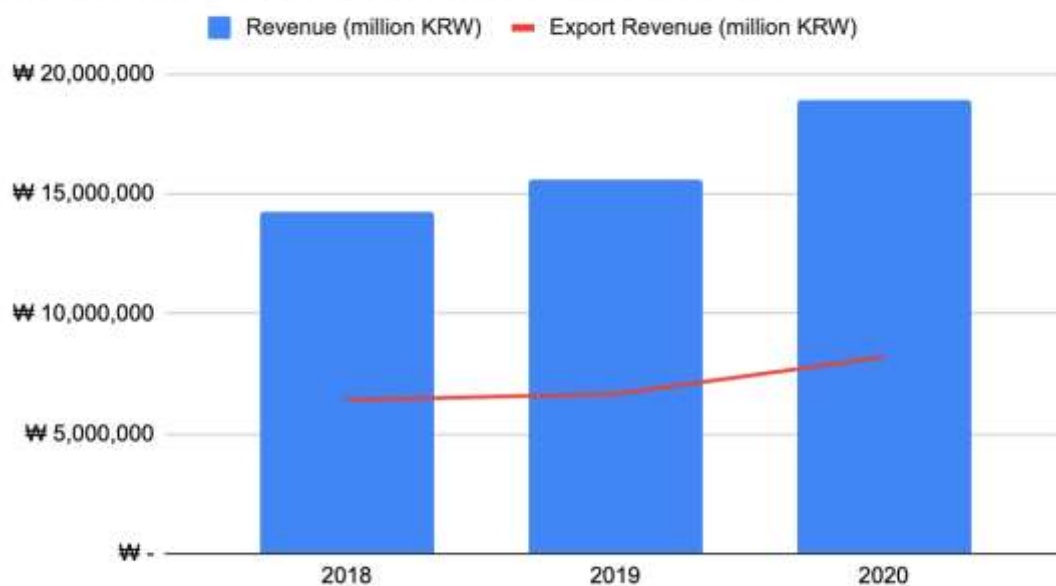
As proven from the data<sup>2</sup> above, Korean gaming companies have been growing in the 2010s in terms of volume and employment rate. But then reached its peak in 2019 and started declining in 2020. To increase the number of gaming companies and employees, we need to get rid of unnecessary restrictions and allow new business models to kick in.

Especially with the given situation of COVID-19 and low marriage, and birth rates, we need good jobs that can support the younger generation to get married and give birth to their children. Without this, the future of, not only the gaming industry in South Korea, but the entire country and the people will face big trouble. Also, the gaming industry is part of the IT industry.

The gaming industry has the core technology in artificial intelligence (AI), computer graphics which will lead the future IT and entertainment industry. Eventually the gaming industry will take over all the movie and music industry which means the industry will grow. The future power of each country will come from IT technology because we are living in the world of computers. Movies, TV shows will all be made with game engines like Unreal. The future technology like NFT, metaverse will also rely heavily on the gaming technology. We need to invest more in the gaming industry.

<sup>2</sup> [https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT\\_113\\_STBL\\_1023486&conn\\_path=I2](https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT_113_STBL_1023486&conn_path=I2)

## Korean Gaming Industry Revenue and Exports



<Figure 2> Revenue and export revenue of gaming companies in South Korea

The decline in the number of gaming companies and employees<sup>3</sup> is a dangerous signal because the revenue and export numbers are in an increase. This means that the profit from making video games is going to the selected few game developers and their employees, which is very bad for the entire industry. It will not allow new human resources to enter the industry and will only make a few companies survive in the long term. If any of them fail in the future, the whole country's gaming industry will also fail.

Given the situations above, play-to-earn is a very promising business model. However, The South Korean government has asked Apple and Google to block play-to-earn games in the App Store and Google Play<sup>4</sup>. The country's Game Management Committee requested that the two mobile marketplaces ban games that require in-app purchasing before playing.

This was one of the biggest reasons why I wanted to study more on this topic. What makes the South Korean government block play-to-earn in gaming? Does the business model have a potential threat of scams? Or is it just because they don't understand the technology? Is it the future of gaming business models?

## 2. Why P2E is Important

F2P is a totally new business model in the gaming industry. Until now, we could not even imagine making money from playing games. As mentioned previously, the game industry's business model has changed by a big margin.

In the early days from the 70's, 80's to 90's video games were playable on separate devices and games had to be bought separately. Since the introduction of the internet and online games, we were introduced with new models called the free-to-play. Online games were provided free-to-play but players had to pay to win. Similar models were in the market such as the in-app purchases or monthly payments.

<sup>3</sup> [https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT\\_113\\_STBL\\_1023486&conn\\_path=I2](https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT_113_STBL_1023486&conn_path=I2)

<sup>4</sup> <https://www.protocol.com/bulletins/south-korea-play-to-earn#:~:text=Lizzy%20Lawrence-,The%20South%20Korean%20government%20has%20asked%20Apple%20and%20Google%20to,before%20playing%2C%20Coin%20Telegraph%20reported.>

Games could be played and players still needed to pay extra money monthly to connect to the online world. However, the size of the market found its limits. During the COVID-19 pandemic, the world was forced to stay home so most of the people decided to play games. The market grew rapidly and many gaming companies enjoyed the growth. After the pandemic, the rapid growth changed into rapid decline in sales. As more people returned to normal lives, the sales dramatically fell for gaming companies. Then the economic crisis came.

Before, bad economy meant good sales for the gaming industry because it was relatively cheap. But, now with the chip shortage and monthly payments required to play games, it's no longer considered cheap which leads to decline in sales. This is the story until present. Now with the introduction of blockchain technology, we need to quickly adopt the new technology and introduce it to the market to generate hype, to gather more people and make them play games.

It also must do a big thing in the gaming corporate's stocks. Since the COVID bubble burst, the stock prices fell rapidly. Especially in the IT industry, the rapid rise since the breakout of COVID, changed into a steep fall in the value of the companies. This was even more the case for the gaming companies. For example, Krafton's stock price reached its peak value of 580,000 KRW during the COVID. After just a few months, the price has fallen to as low as 169,000 KRW. There must be a momentum in the industry. We need more investment to be made and that is going to be P2E. A new revolution, where players can make real money from playing games.

### **3. Research Methods**

In this Business Project, we will study on how P2E business models are implemented in games and figure out if there has been any successful P2E games. If there have been any successful games, we will find out how the game has been successful and why.

With the research results we will try to find out how we can learn from these cases and implement the method to the Korean market and Korean P2E games. This is because if there is a market that has adopted the new business model without any issues or conflicts, we can apply the very same methods and laws to reduce the chance of having issues in the market.

## II. Play-to-Earn Game

### 1. Overview

A play-to-earn NFT game is a blockchain-based game that rewards players with digital assets like NFTs, character skins, or crypto. These can be earned by conquering levels, participating in contests, or just simply devoting time to the game.

### 2. Concepts and Definitions

The term “play-to-earn games” gives you a good clue of what these games are. Players can actually acquire money just by playing games. Play-to-earn is a business model that works on blockchain technology. It is simple, players can play a game and potentially earn cryptocurrency. How does all this happen to be exact?

In play-to-earn games, players can get a hold of potentially valuable in-game assets. That can be anything, from skins or cards to a specific type of cryptocurrency. The more players play, the more assets they are able to collect, as well as make them more valuable. In traditional games, these assets are only valuable inside the game in question. However, play-to-earn games, have real-world value.

At any moment, players can transfer these assets to the real world and sell them for cryptocurrency or real money. Moreover, unlike traditional games, these games are decentralized. This means that the developer isn't able to control everything which gives more transparency to all aspects of the game's ecosystem. In play-to-earn games, in-game assets are distributed among players. By participating in the in-game economy, players generate value for other players as well as the developer.

All of this works for one simple reason. These games consist of two things people crave entertainment and the possibility of making money. Play-to-earn games are frequently called crypto games. The main selling point of play-to-earn games is the fact that just by playing the game, players can earn cryptocurrency. In the players' minds, this can easily translate to the fact that they can become rich if the value of the cryptocurrency rises. Player motivation aside, here's how these games work.

Essentially, crypto-based games reward players in small amounts of cryptocurrency. They collect cryptocurrency by participating in tasks, contests, or any other activity the game brings. There are two main approaches developers can take. The first approach they can take is the native cryptocurrency. Developers can create a game's own native cryptocurrency in the form of tokens.

To make this happen, they need to create a blockchain project, design tokens, and close the deal with smart contracts. Essentially, these tokens act similarly to typical in-game currencies. However, unlike them, they have real-world value. The most popular example comes from the world's top blockchain game, Axie Infinity. In it, we can find two native cryptocurrencies, SLP and AXS. These cryptocurrencies exist on the Ethereum blockchain. And just like other cryptocurrencies, their values change all the time. At any time, players can sell them to other players and get cash. Some other examples of popular native cryptocurrencies are MANA from Decentraland and SAND from The Sandbox.

The developers can take the second approach and rely on the existing cryptocurrencies. For instance, Bitcoin, Ethereum, Dogecoin, Cardano, etc. All of these mentioned coins are well-familiar names. For this reason, a lot of games based on cryptocurrencies are also named after them. For example, Bitcoin Tycoon, Bitcoin Pop, etc. Not to mention numerous games with the term “crypto” in them, such as CryptoKitties, Crypto Dragons, etc. Even though these games reward players directly with some of the established cryptocurrencies, it can take a while to accumulate a significant amount.

In other words, the monetization process is usually long, and the payouts are stingy, but they are real. Then there comes another term. There is no talking about play-to-earn games without talking about

NFTs(non-fungible tokens). NFTs are virtual collectible assets. They can come in all sorts of different forms, from images to music and video. In gaming, they usually appear as things players would collect anyway. For example, characters, items, skins, or virtual land.

NFTs are unique, irreplaceable assets that are impossible to duplicate. Think of them as the equivalent of the Mona Lisa painting. Only on the blockchain. And in gaming. It is the one and only. These assets are stored on the blockchain, not just within the game. Also, each of them holds its own value. Let's say two players have two almost identical NFT characters in the same game. However, one of them has a red helmet, while the other has a blue one. If they were to trade, one of them would end up having a more valuable character than the other. Are play-to-Earn NFT Games Free-to-Play? You may be wondering do these games just hand out NFTs to players? This depends on the developer.

Some developers make their games free-to-play. In those games, players can earn NFTs as rewards for simply playing the game. All it takes is some time and engagement. Others ask for more than time. Some developers ask players to make an upfront investment to even start playing the game. More precisely, they need to purchase NFTs from other players. These games are also known as pay-to-earn games. Despite their differences, these games still fall into the same category. In both, players can generate some kind of value that brings potential profit.

NFTs are the players' property. Not the developers, not the games, nor anyone else's. Even if the game shuts down, they remain in the players' hands. Usually, players will do everything in their power to increase the value of their NFTs. This means they need to play the game and commit to it for a while. When they decide the time has come, they can trade or sell them. Players can take their NFTs outside the game and offer them in different dedicated marketplaces. If they manage to sell them, they will get paid in cryptocurrency. When designing a play-to-earn economy, developers can't just think about their profits. Here, players and developers are something like business partners. In the case of NFT-based games, it works like this. The players' role in the partnership is to hold valuable assets and distribute them by trading. This should bring in more players to the game. Simultaneously, as the demand for the game's NFT collection grows, so does the developers' profit. There is one key thing developers need to pay attention to.

Producing NFTs comes with a cost, and it needs to pay off. The developer makes money from transaction fee cuts. Every time an NFT changes hands, this means profit for the developer. Let's say a royalty fee for a skin NFT is set at 5%. The original creator (the developer) will make money every time this NFT is sold to another player. Not just the first couple of times, but indefinitely. Therefore, the developers should make sure to set a profitable fee. Besides this, they should continuously encourage players to transfer these assets.

The same principle applies to games that run on native cryptocurrency. What about the games that hand out existing cryptocurrencies? How do they make money? In most cases, by displaying ads to players. The key factor here is time. As long as players spend a lot of time playing the games in order to earn some crypto, the developers should be making enough ad revenue.

Play-to-earn games have caused a major psychological shift. Not just in the way developers develop games but also in the way players perceive them. The essence is players are starting to realize their value. They won't settle for one-way communication and greedy economies anymore. They want a more prominent involvement in games, and they want to own the assets they've put in the effort to acquire. However, for some players, these things don't matter that much. For them, it's all about making money.

In some countries, the players recognized play-to-earn games as a way to make a living. The best example of this is the Philippines. When the pandemic first began, the unemployment rate in this country climbed up to 40%. Besides that, the minimum wage in this country is very low (approx. \$230 per month, according to Countryeconomy). One particular game became a phenomenon in the Philippines, Axie Infinity. At the time, players could earn up to \$1000 a month by farming the game's SLP currency (101

Blockchains). All of this went so far that the Philippine government announced that people who play this game for a living will need to start paying taxes.

As you probably know, Axie Infinity is a pay-to-earn type of game. The question that naturally follows is, how do Filipinos afford the entry cost? To overcome this barrier, players have formed NFT rental communities (guilds). Within these communities, Axie owners rent their NFTs to players at a small cost. The new players can then play Axie Infinity and earn cryptocurrency with no significant upfront payments.

### **3. Play-to-Earn Games in South Korea**

#### **i. History**

In Korea, online games have always been popular. Games like Lineage have succeeded in both the PC and mobile game worlds. Since NFT and play-to-earn games gained popularity in other parts of the world, Korean game developer Natris released the very first play-to-earn game, Mudolrebirth in the South Korean market. The beginning of the game was very successful because players could acquire a cryptocurrency named Mudol by completing quests in-game. This was a sensation because Mudol could be exchanged for another cryptocurrency named Klayton. Klayton is a cryptocurrency developed by the Kakao group, famous for the smartphone messenger app, Kakao Talk.

It is listed in all four of the Korean major cryptocurrency trading platforms, and since June of 2021, it is listed in the world's largest trading platform Binance. Being able to exchange Mudol with Klayton drew the attention of many players and the ecosystem began to grow. Players could earn up to 100 Mudols a day by completing the in-game quests. Also, by competing with other players, up to a total of 2,000 Mudols could be acquired as well.

Many players created multiple numbers of accounts and were able to generate a decent amount of profit. When Mudol's value was 4.18 Klaytons and Klayton's value was roughly 1,620 KRW, players could earn up to approximately 6,800 KRW per hour just by completing the default in-game quests. This is already a very close amount to the minimum wage in Korea but if players decided to compete with other players and earn an extra 2,000 Mudols, they were able to create a promising profit.

However, with the rising popularity of the game and inflation of Mudols, the value rapidly decreased. The game developer tried to control the inflation and reduced the Mudol that was acquirable but failed to stop the fall of the Mudol's value. By December of 2021, Mudolrebirth was banned from the Google Play and Apple App Store. Another very popular Korean play-to-earn game is Mir 4. This game also supports exchanging its in-game currency for cryptocurrency. But, as mentioned above, it is considered illegal in Korea and for that reason, this feature is not supported when playing the game in Korea. However, players can connect to the internet via VPN and connect to the game on other regions' servers. This has caused a huge complaint from Mudolreverse players as Mudolreverse players didn't have the option to join from other regions' servers, as it was only serviced in Korea.

This is not the only absurdity. Recently, a move-to-earn app Stepn successfully made its launch in South Korea. To earn using this app, users have to purchase NFT shoes for roughly 1.5 million KRW and work out. Stepn gained huge popularity because users can acquire up to 40,000 KRW just by working out for ten minutes. Stepn's ecosystem is a lot like that of other play-to-earn games introduced above. But, how was this considered legal in Korea? Well, the Game Rating And Administration Committee didn't consider this app as a game app but decided it was a health app because it makes its users work out. If they had considered this app as a gaming app then in accordance with Article 32, Paragraph 1, Article 7 of the Game Industry Promotion Act, which states that tangible and intangible results obtained from the game cannot be exchanged because it may encourage speculativeness, it could be deleted from the App Store.

This case has made many players and game developers mad as this kind of act demotivates Korean developers to continue their business in the Korean market. In fact, major gaming companies, such as Com2us, Netmarble, Kakao Games, Neowiz and etc, are continuing to grow their investments in markets outside of Korea. In the case of a new business, market preemption is important, but regulations may cause domestic companies to miss the golden time.

According to the law, it is illegal for game product providers to provide users with cryptocurrencies as a gift, encouraging speculative sentiment. To be precise, it is against the law by providing users with cryptocurrencies that can be exchanged and exchanged through the business exchange. In other words, the domestic service of play-to-earn games that give cryptocurrency is illegal. Therefore, play-to-earn treats games with systems linked to cryptocurrencies as having liquidity, so they cannot be serviced in Korea because the Game Management Committee, which was established under the influence of the Sea Story crisis in the past, refuses to review it. does not exist. So, Mir 4 is also blocked in this system on the Korean server.

As of 2021, quite a lot of Korean game companies are preparing games that introduce NFT, so there is a growing demand in the industry to allow this system. Even if Korea permits this system, because of the travel rules recommended by the International Money Laundering Organization (FATF), of which Korea is a member, each exchange, this play-to-earn is subject to the Special Act. There is a high possibility that the service as a website will be blocked by the vigilante committee unless the law is amended. However, like other illegal sites, there is a high possibility that only Korean IPs can be used by blocking the cryptographic function and bypassing other countries' VPNs.

Speaking of VPNs, Mudol Samgukji, the first-ever P2E game to be serviced in South Korea and, at the same time, the first-ever P2E game to be shut down by the Game Rating and Administration Committee, has recently made its return in October of 2022. In 2021, Natris, the P2E game Mudol Samgukji developer, was removed from the stores by the Game Rating and Administration Committee.

The reason was that they had been abusing the autonomous rating system. Now the game is back in the stores, claiming to have removed the P2E element. The trick they used was, instead of directly connecting the game and the wallet, it supports coin exchange outside the game by linking the Google account. It has been three months since the game returned with the new coin exchange system, but the Game Committee was unaware of this fact. The reason behind this is because the Game Committee stated that there was no way to regulate the use of overseas content using VPN. It has been confirmed that the in-game currency (Mudol pieces) which is being serviced in Korea, can be exchanged for a virtual asset called MUDOL2.

Unlike the previous game, where the Game Rating and Administration Committee put it down, Google accounts and virtual asset wallets were linked to websites that could only be accessed using a VPN instead of linking wallets in-game. Therefore, if you link your Google account, you can check the game currency Mudol pieces that the account has and change it to MUDOL2. MUDOL2 is traded at about 0.05 USDT per piece on the global virtual asset exchange MEXC, which translates to roughly 70 won.

Natris also released the game Mudol Samgukji in Korea with P2E elements last year. Abusing the autonomous rating system to avoid the eyes of the Game Committee. As a result, more than 200,000 gamers gathered in Mudol Samgukji a day, and the Google Play sales ranking of Mudol Samgukji remained 10th for more than a week. The game industry estimates the daily sales of the top 10 games on Google Play at around 100 million won. However, the Game Committee is not taking action against the 'tricks' of Mudol Samgukji. This is because the Game Committee did not know that in-game goods could be exchanged for virtual assets. Moreover, there is no way to regulate the current version of the game as it does not violate any laws.<sup>5</sup>

If other game developers choose to implement the same methods Natris used, previous regulations don't mean anything and other developers can release P2E games. South Koreans would have to use VPN to access their currency, which could be cumbersome, but still can earn money from playing

---

<sup>5</sup> <https://www.techm.kr/news/articleView.html?idxno=102289>



games. This says it all. There are multiple ways to go around the regulations for game developers. Instead of just blocking P2E games in South Korea, the Game Committee should allow it and provide guidelines for developers to take note of.

While the South Korean market's future in P2E games is still very vague, South Korean game developers continue to introduce new P2E games to markets outside of South Korea. For example, Me2on announced on the 11th of October 2022 that 'Pocket Battles NFT War', a P2E game jointly developed with its subsidiary Me2Gen, has surpassed 100,000 daily active users (DAU). Pocket Battles NFT War was launched globally on July 28, and has been gaining popularity since its release, ranking first in the trending rankings on global P2E game ranking sites. As of October 2022, it is maintaining the second place in the trending ranking and the second in the casual game ranking.

Many users in all regions of the world, including Vietnam, Indonesia, Brazil, the Philippines, and the United States, are playing the game, and the reconnection rate (retention) is also recording more than 50% as of the 7th, showing significant results as a P2E game.<sup>6</sup> In the meanwhile, many members of Congress, along with experts, have claimed that the regulations made by the Game Rating and Administration Committee are too harsh.

At the 'Debate for the Development and Promotion of the Game Industry' held in the auditorium of the National Assembly Experience Center on the 30th of September 2022, Yoo Byung-jun, professor of business administration at Seoul National University, said, "P2E games incorporating blockchain technology are gaining popularity worldwide, but in Korea, domestic service is unavailable according to Paragraph 1, Article 32 of the Game Industry Act." He also said, "The game industry is an employment-friendly industry with a higher employment inducement coefficient than other industries, and we expect that the effect of creating jobs through P2E games will be large." However, based on cryptocurrency, the metaverse service is also partially restricted due to the game industry law, such as excluding games in the metaverse or not showing them in Korea."<sup>7</sup> Luckily, we have mainstream members of congress and professors interested in the issue, and it is being discussed by the government. We hope to see positive actions in the near future. As of 13th of October 2022, a big change has been announced by the chairman of the Game Rating and Administration Committee at the inspection of the administration. Chairman Kim said, "I want to allow P2E games, too," when asked about the permission of P2E games at the National Assembly's Culture, Sports and Tourism Committee audit on the 13th.

At the National Assembly the day before, Rep. Lee Yong-ho of People's Strength pointed out that "Korea's P2E games also need opportunities to grow," and "we need to open up space such as limited permission." In response, Chairman Kim replied, "I will find a way to apply for support by the time the current law is revised."<sup>8</sup>

---

<sup>6</sup> <https://n.news.naver.com/mnews/article/008/0004804081?sid=105>

<sup>7</sup> <https://n.news.naver.com/mnews/article/031/0000700691?sid=105>

<sup>8</sup> <https://n.news.naver.com/mnews/article/366/0000847351?sid=101>



9

<Figure 3> WeMade’s stock price between July 26 – October 26 of 2022

Above is the recent stock chart of the gaming developer/publisher Wemade. It is widely known for its popular IP Mir and a P2E game Mir 4 based on its popular IP. The stocks continued to decline since their peak in early August of 2022. Dropped more than half of its value until the 13th of October of 2022. However, with the announcement made by the chairman of the Game Rating and Administration Committee the stocks are rapidly increasing on the 14th of October 2022. As of 26<sup>th</sup> of October, the price is continuing to increase in a very fast pace.

This reflects how much the market sees potential in the P2E gaming world. It will be the next big thing in the world of gaming and we must get our hands on it earlier than others to take a big share of the market. South Korean gaming has been doing a great job in recent years since the success of PUBG: BATTLEGROUNDS made by KRAFTON. To continue this success and grow bigger, P2E is the next thing we should focus and invest on. Even at this point, new South Korean-made P2E games are introduced to the markets outside of South Korea.

Zemiter, the blockchain platform released its first game called Abyss on the 13th of October 2022. DFChain released a new Infinity market in the Philippines on the same day. Crypto Arc, Me2on, and numerous other South Korean gaming and blockchain companies are releasing P2E games outside of South Korea. This has to change soon and we need to open up the South Korean market. I’ve addressed this many times but I’m going to do it again. South Korea has many good game developers and publishers. If they receive the market and government’s support, I am sure they will come up with a successful product that will enlarge the gaming industry.

## ii. Limitations and Challenges

Metaverse, NFT, and play-to-earn, which emerged as major keywords in 2020 centering on major domestic and foreign companies, began to bubble a lot with the plunge in the value of cryptocurrencies a year later, revealing the limitations of play-to-earn games.

The problem was the core of the play-to-earn model. The very concept of "make money by playing instead of working" was contradictory. In the first place, playing is no fun when it's work, so unless the existing gamers are for fun, you can't expect an influx of users who have money to spend. For this reason, there are companies that have switched to P&E, but the problem is that they only substitute terms and the goals and results are not very different.

If it was possible to make it that much fun, it would have been successful even if it wasn't play-to-earn. Therefore, the reality of the existing play-to-earn games is that inflation must occur in their home

<sup>9</sup> <https://finance.naver.com/item/frgn.naver?code=112040&page=2>

country, and foreign users with good spending habits must flow in to make money through the game. Therefore, there is a situation that does not meet the expectations of play-to-earn advocates that "it is easier to make money than labor". In Axie Infinity, the most representative Play to Earn game, the cashable SLP coin could not be circulated in the game and was continuously cashed, resulting in a price drop to a tenth level.

Naturally, since most of the users are playing games to make money, users quickly leave. In the case of Mir 4, there was an incident at the end of 2021 when WeMade sold Wemix in large quantities without prior notice, and the market price plummeted by nearly 30%. The fact that a game company has plunged the coin price due to a sell-off is an act that sends a message that the game company can intervene again at any time due to a price drop, and at the same time inflicts losses on gamers participating in play-to-earn games.

Wemade stated that the sale was for investment purposes to expand the coin ecosystem, but the funds secured in this way were used to acquire SundayToz. The Wemix coin, which lost its trust, plummeted nearly 80% from \$24 to \$5 in two months. As mentioned earlier, like Exy Infinity, it was popular only in developing countries where inflation occurred such as the Philippines, Brazil, Nepal, Nigeria, Bangladesh, and Venezuela, and the economy of the games was also a brief influx of rich overseas users due to their sparkling popularity.

When the price of cryptocurrency that can be converted into cash fell, inflation occurred even in the economy of the game, causing users to leave. In other words, as the term, play-to-earn says, when the value of the inflow factor of fun decreases, in the case of playing a game to make money, there is a clear limit in which the inflow of funds does not occur.

In Korea, this kind of play-to-earn release is illegal, so the Game Board is blocking it. In response, some users support play-to-earn in the expectation that they can earn money by simply playing and earning cryptocurrency, and are criticizing the Game Board. According to the experiences of those who have actually done it, it was difficult to earn as much as the minimum wage in Korea. As mentioned above, you can expect profits from inflationary countries where the value of your own currency has fallen or from speculation by capital gains through cryptocurrency.

The explanation that you get paid just for the game is false because it doesn't come out as much as your actual salary. Some point out that it is possible to earn more by operating a cryptocurrency mining program. There are also issues with probability-based items in games. In April 2018, the Fair Trade Commission of Korea issued a corrective order to three domestic game companies (Nexon Korea, Netmarble Games, and Next Floor) for probability items and imposed fines and fines for negligence. This is because the companies did not disclose the probability of obtaining a particular item when players try to buy it.

In the case of Sudden Attack by Nexon, since 2016, they have been hosting celebrity puzzle events. When players purchase a paid item, they get puzzle pieces and benefit from them when they collect all 16 pieces of each type. Nexon did not set the probability of obtaining all the pieces but stated, 'Pieces are randomly distributed from 1 to 16'. If the same probability was applied to all pieces, they should have a set value of 6.25%. But the actual probability of the pieces was set from 0.5% to 2.65%. Also, in October 2016, it was stated that the probability of obtaining a 5-star child in the game Destiny Child was 1.44%, but it was found to be 0.9%. The Fair Trade Commission issued a correction order and imposed a fine of 5 million won Another example is the Baseball game, Magumagu.

Netmarble stated that the probability of acquiring items would increase by ten times during the event period. However, it was only increased by 3.3 times (increased from 0.3% to 1.0%) or five times (increased from 0.01% to 0.05%). The Fair Trade Commission issued a correction order and a 7-day publication order and imposed a fine of 5 million won. Currently, probability items are monitored by the Korea Game Industry Association and the Korea Game Policy Autonomous Organization through a system called 'probability-type item self-regulation' introduced in July 2015. Although individual probabilities are disclosed, and probability information is displayed on the purchase screen in the game, it is claimed to be ineffective because it is an autonomous regulation rather than a legal regulation.

Meanwhile, at the end of May 2021, the Korea Game Industry Association revised its self-regulation to include content that strengthened probability disclosure. They then took effect from December 2021.

In Europe, legislation on the regulation of random items at the EU level is in progress, and in the US, a bill to ban random items in games for minors and allow them only in adult games is in progress. In addition, regulations on random boxes are being introduced legally or autonomously in many countries such as China, Japan, Australia, the UK, France, Germany, the Netherlands, and Belgium.<sup>10</sup>

### iii. Chances

In this study we have mentioned a lot about the possibilities of P2E games. However, as mentioned right above, the business model could be considered illegal due to probability issues of items, digital assets, gambling, and taxation issues. For example, in developed markets like France, the qualification of tokens (fungible or not) as digital assets is an important issue in this nascent industry.

Purchasing in fiat or cryptocurrency under these qualifications represents a service that may fall within the scope of regulations applicable to token issuers or digital asset service providers (DASPs). Any type of tokens and NFT must be analyzed by the French Monetary and Financial Code that cover both utility and virtual currencies. If the assets available through P2E games follow the rules, the games can be qualified to the market.

One, the French legal regime of tokens' issuance, if the gaming platform issues tokens that fall under the notion of digital asset. Two, the DASP regulation, if the gaming platform allows the purchase of tokens in fiat-currency or crypto-currencies, additionally to the ability to freely allocate them. Or provides a storage (wallet) service linked to the gamer's account that is supporting the token. And finally, connects sellers and buyers through an exchange platform.<sup>11</sup> P2E games also have a risk related to gambling.

The following three must be met to qualify an activity of gambling and games. First, reaching out to the public. Reaching out to a larger circle than a private and restricted one is enough to qualify as a public offer, within the meaning of prohibited lottery legal regime. Second, offering an expected gain due to pure luck. Third, involving a financial sacrifice. Finally, there is the tax issues. The taxation of the game developers normally relies on the classification of the NFT. Therefore, it is a must to define the VAT regime to benefit from all parties provided by the law. However, as mentioned above, regulations are not the core fear that the P2E business model is facing. Eventually, the South Korean government will lift the bans as it is a globally recognized business.

What the industry can do is to find a way to provide a stable profit by playing P2E games. Once the game service providers can provide a stable profit, players will flood into the ecosystem and stay there. The solution is to come up with a stable coin and provide the asset to players to play the game. This way, the players will be compensated with good amount of stable assets which will attract more players and make the existing players stay in the game.

In the stable coin world, there are three different types. Fiat-Collateralized stable coin, Crypto-Collateralized stable coin, and Non-Collateralized stable coin. They all have their own methods of keeping the currency stable.

Fiat-collateralized type means that a specific company or institution deposits fiat currency in their account as collateral and issues tokens corresponding to the amount. In many cases, they issue

---

<sup>10</sup> <https://www.edaily.co.kr/news/read?newsId=01167686628981352&mediaCodeNo=257>

<sup>11</sup> <https://www.orwl.fr/en/en-blog/nfts-and-play-to-earn-legal-compliance/https://www.orwl.fr/en/en-blog/nfts-and-play-to-earn-legal-compliance/>

tokens that can be exchanged for 1 USD and a 1:1 ratio. It is also simple to use. All you need to do is deliver the stablecoin to the operating institution and convert it into fiat currency.

In addition, the active institution constantly exchanges cryptocurrency and fiat currency according to the set exchange rate. By transacting through stablecoins, buyers and sellers can minimize the damage caused by price fluctuations. Even if the price of stablecoin fluctuates on the exchange, it is thanks to the universal value (1 USD) that can be recognized through the operating institution. However, as the operating institution voluntarily issues tokens, exchanges money, and manages deposits, there is a disadvantage in that internal information needs to be more transparently disclosed. For example, suppose the operating institution secretly steals the fiat currency deposited or does not change the policy to exchange fiat currency at the set exchange rate. In that case, the stablecoin becomes a piece of tissue paper.

The Bank of Korea and the game industry can come up with the same solution. They can create a stable coin which can be transacted with the KRW on a 1:1 scale. This will not only support the value of the stable coin but the KRW as well. Because, if the P2E game gains great popularity in the market, the more players will play the game. For obvious reasons, this means the economy in the game system becomes good and the assets will see an increase in value. As more players from around the world gather to play, the more we will see in value increase. Not only the value of the in-game asset, but the KRW as well. It could be a step towards making the Korean Won to one of the key currencies. Korea's economy can support the value of the KRW, and the already strong Korean industry can support KRW by introducing triple A P2E game titles to the world.

### III. Case Study

#### 1. History of Axie Infinity

Young CEO Trung Nguyen, born in 1992, was interested in computer science and digital technology early enough to work as the CTO of Lozi.vn, a Vietnamese e-commerce startup, in 2012 at the age of 19. In 2017, he conceived an educational game that could easily promote blockchain technology with NFT, a token representing scarce digital assets. Within Axie Infinity, there are AXS (Axie Infinity Shards) and SLP (Smooth Love Potion), which are used as in-game governance tokens. These tokens can be traded with real coins, which can be converted into real currency. In other words, it is a system that can make money with these tokens. With its unique play-to-earn design, Axie Infinity has become a globally popular game with more than one million active players worldwide.

So, how does P2E games remain legal in almost all countries except for South Korea and China? In most countries, including the USA, where profit made from cryptocurrencies are taxable, the P2E business model is considered completely legal<sup>12</sup>. This means, as long as proper tax is paid from generating a profit, the business model remains legal. This is a very simple but smart way to decide whether it's legal or not. The South Korean government and should consider taking a look at other countries' cases and try to adapt the tax related regulations because if we can tax the players and the gaming developers, it is good for the government as well.

The advantage of helping Vietnam become a potential place for blockchain technology and games is that lots of human resources with diverse choices and low cost will help blockchain games run without many financial difficulties. In addition, the labor related to the blockchain is cheap. Moreover, Vietnam ranks in one of the top ten countries that own the most cryptocurrencies in the world. This is also a basis for promoting the development of games associated with NFTs and cryptocurrencies.

Not to mention, technology related to blockchain and blockchain gaming is receiving lots of support and attention from the government. It is one of the digital technology fields on the priority list of research, development, and application to join the Fourth Industrial Revolution proactively.

The Ministry of Science and Technology issued Decision No.2813/QD-BKHCN approving the National Key Science and Technology Programme for the period up to 2025, in which blockchain is ranked second after AI in a wide range of essential technology products. Therefore, the blockchain game market, including the P2E games in Vietnam, promises to experience a significant boom soon.<sup>13</sup>

However, Vietnam has no legal regulations for cryptocurrencies. According to Article 6 of the Law of Vietnam 80/2016/ND-CP, virtual currency is not a lawful means of payment because it is not included in the payment stipulated by the State Bank of Vietnam. But, Vietnam does not prevent owning, trading, or investing in cryptocurrencies. Considering this issue, in 2021, Vietnamese Prime Minister Pham Minh Chinh instructed the State Bank of Vietnam to work with government ministries such as the Ministry of Justice to study cryptocurrency trading and ownership policies. However, Le Thuy Nga, a member of the Institute of Legal Science under the Ministry of Justice of Vietnam, said that Vietnam still needs to prepare laws on taxes and transactions related to cryptocurrency and other virtual assets in line with the 4th industrial revolution.

#### 2. Limitations and Challenges

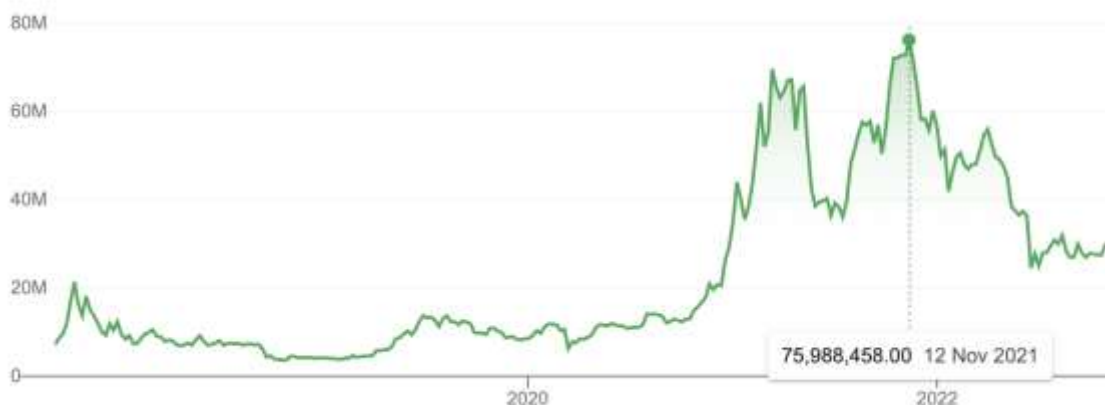
While the game still remains legal in most countries, there are some limits and challenges that need to be tackled. The value of the asset declining is one of them. The main purpose of P2E games is the fact that players can earn a profit from playing games. Therefore, they must earn a certain amount of money to

---

<sup>12</sup> <https://marketrealist.com/p/is-axie-infinity-legal/>

<sup>13</sup> <https://vir.com.vn/cleaning-up-legislation-for-nft-success-in-vietnam-92857.html>

keep playing the game, that is what motivates them. However, as we have seen many times before, most of the time, the value of the crypto currency is not stable.



<Figure 4> Bitcoin price since 2017 until 2022

Bitcoin, which is one of the most famous and popularly traded and is a symbol of crypto currency, has seen a great fluctuation in value for the past few years. If the value of the asset that players can acquire from playing P2E games shows this much change in value, more unlikely players will want to play the game. For example, if you are a normal everyday worker and do the same amount of work. But, the income varies everyday depending on the situation of the market and the changes are extremely big. That will not attract new players to the industry and shoo away the current players. The industry has to somehow find a way to keep the value of the earnings stable.

### 3. Discussion

A discussion regarding whether the P2E should be legal or remain illegal went on in the Krafton lounge in the headquarters building on the 26<sup>th</sup> of August 2022. Three participants are all Krafton employees and have been working in the gaming industry for 10-plus years and they are all in the PUBG HQ Team where they are responsible for global game publishing. They shared their thoughts, and all three of them didn't want to share their personal information, so they'll be addressed as A, B, and C in this report. The first debate was about whether we can all P2E games should be considered as a video game.

A: I personally say there is a bright future in the P2E. I consider it as a new business model that can attract new players and grow the gaming industry. Therefore, I call P2E games, a real game. But of course, the game itself has to be fun to play no matter what. The first thing in games is the fact that it has to be fun to play. The business model doesn't matter.

B: I also can say that P2E is promising in terms of future business models in the gaming industry. But, the recent fall in the crypto and stock market is a big risk. If the in-game currency has a big fluctuation like this, players will doubt the consistency of the business. We need to somehow find a way to deliver a stable profit back to the players so that they can actually feel that they're making a profit out of playing P2E games.

C: In my case, I suggest it should stay illegal. I understand that it is a promising new business model. However, it feels too much like gambling. Games should stay as games. This means that players should pay to play the game and have pure fun. If they're able to create profit by just playing games, it would no longer be pure. Remember when you first started playing video games? Didn't you enjoy the pure art of having fun by clearing missions and stuff? I believe the game should stay pure and should not provide any kind of profit just by playing the game.

A: But, many games until now provided profit to players in one way or another. For example, NC Soft's Lineage. It has been out since 1998 and many players' jobs were just playing Lineage. This was possible because they could trade their in-game items with other players for real currency. Some items were even worth more than 100,000 USD.

B: Video games have developed in many ways over the past few decades. At first, we only had to purchase the package then we were able to play forever. Then came the free-to-play models. Players could just download the game for free and play for free but had to buy in-game items to become more powerful or save time. When the free-to-play and in-game item purchase model was first introduced, it received much criticism. Now, it is one of the most popular business models in the industry. P2E is the new era we should accept it.

C: I understand that it's new. But I don't want the players to play my game just to make a profit out of it. I believe that the number one goal in games is to provide pure joy. If that is done, then I can consider providing the P2E business model. But again, I want my game to be fun.

Then the second question followed. Why do you think the Korean government is restricting the P2E model in South Korea when it is legal in other parts of the world?

A: The Korean government, or the Game Rating and Administration Committee to be exact, have always been criticized for poor decision-making. They're always against new things in the industry. Especially with new business models and female characters. The P2E situation is no different. They are not allowing the new business model because they don't properly understand what it is. There have always been many different ways to trade in-game items into real currency in the past. They never block that from happening. Why now?

B: That is true. Making a profit from playing games has always been possible. Selling in-game items, accounts, or even collecting tax from other players who are in the same clan. It is human instinct to create profit in a world where many people gather. I don't see it as a problem; it has stayed legal for the past two decades. I don't see a problem with the P2E business model at all.

C: I see the point. However, P2E can be considered as gambling. You two have mentioned many ways to generate profit, but they're all not supported in-game. Item and account selling is done outside of the game by players. Players meet at a different platform, like Itembay, and trade their items and accounts with real money. None of the action is done in-game.

A: How could that be compared to gambling? Gambling is chasing after something with indefinite chances. This business model clearly states the amount of in-game currency the players can acquire by doing something in-game. With that currency, they can exchange it with cryptocurrency, which of course, has very big fluctuation. But that can't be defined as gambling.

Should the Game Rating and Administration Committee of South Korea allow P2E games?

B: Absolutely. I don't see any reason why it should be restricted. Once we allow the new business model, the gaming industry will grow even bigger allowing us to generate more jobs. Also, regardless of the restrictions, game developers will come up with ways to avoid the restrictions as long as they see a market. Mudol Samgukji, the first P2E game to be serviced in South Korea and closed due to restrictions is a very good example.

C: That is true. As long as there is a market, game developers and publishers will continue to find a way around it and continue to release P2E games. This makes the Game Rating and Administration Committee's restrictions useless.

A: Same here. They should allow the business model legal in the South Korean market. We should grow the industry, not shrink it. Gaming industry is well known for creating decent jobs in the past. Do you think the P2E games will end up generating new jobs in South Korea?



C: Sure, of course. That is so obvious. The gaming industry is well known for job making. I am confident that the industry will make much more jobs if they come up with successful products. However, I'm still unsure of the P2E business model as it will not be successful in developed countries like most of Europe, South Korea, Japan, and so on.

A: Why don't you think it will succeed?

C: Because developed markets don't have the player base who will play games to earn money. They will only want to play games that can entertain them. They will not think of gaming as profit-making but as part of entertainment.

B: I see your point. However, before Mudol was blocked in South Korea it was extremely popular among gamers. This means that even developed markets have the opportunity for P2E games. There still is a great number of audiences who want to make a profit by playing games.

A: Exactly, there are players who are willing to make money from playing games and this has been proven with all the P2E games that have been introduced in the market. Until now, all of them had very poor quality as a game but they still were very popular because players could make money out of them just by playing the game. Therefore, I believe that we have a bright future in this game genre.

C: Okay. Understood. I see what your points are and agree with what you two said. I have been very conservative about the new business model until now and I will be in the future, but I understand what you two mean. So to wrap it up, even in the developed markets, there is still room for the P2E model and for that reason we should persuade the Game Rating and Administration Committee to remove the restrictions they have put on the P2E games. This will help the gaming industry grow even further and it will provide more jobs to the younger generation in South Korea which might boost the marriage and also the birth rate which is already in big trouble. Am I right?

A: Yes. It looks like you have understood the point very well, indeed. We're very lucky that we had a conversation like this since we have an NFT department in the company.

B: Absolutely, I reckon we should have these conversations regularly to come up with a way to persuade the Game Rating and Administration Committee and develop P2E mobile games. We need to come up with better performing mobile games because we just don't have good mobile games.

It seemed like most of the participants were favorable toward the new business model. As I the regulation should come to an end. However, there were still concerns about the gambling-like business model as it is still very controversial in many markets. The conclusion of the discussion is, that the Game Rating and Administration Committee should be open to more business models and give opportunities to game developers and their employees because if the product succeeds, it will generate lots and lots of jobs for the relatively younger generation which could lead to marriages and births of newborn babies.

## IV. Strategic Suggestion

### 1. Road to Success

If the gaming companies are looking for success in the P2E market. They will have to convince the Game Rating and Administration Committee that this new business model is healthy and will grow the game industry. According to a researcher's latest study, due to the COVID-19 pandemic, the global Play-to-Earn NFT Games market size is estimated to be worth USD 776.9 million in 2021 and is forecast to a readjusted size of USD 2845.1 million by 2028 with a CAGR of 20.4% during the forecast period 2022-2028.<sup>14</sup>

We can't afford to miss out on this huge market. Our gaming companies have to point out the fact that there is a huge market out there. Once the companies get rid of all the regulations they can bring games that will sell to the market. I am confident that they will because the South Korean gaming companies have the potential to do so. They have been so successful in the PC, console, and especially in the mobile gaming world. The strategic suggestion is as follows. First, look back at what some of the developed markets have gone through regarding the regulations related to P2E and the assets.

It is a good idea to follow the path they have gone through by adopting their related regulations and laws. By doing so, the Korean market can reduce many risks related to the new business model because they have all been handled by the developed markets. Then as a joint venture between the Korean government and the gaming companies, they can create a new stable coin which can be used mandatory as rewards across all Korean P2E games. How do you generate a stable coin? In the case of rewards for P2E games, Fiat-collateralized types are appropriate as the value is stable. This will generate a great hype among the game players and will attract players to join the game.

Tether, which is considered to be the most representative stable coin, issues a coin with the value of one Tether token fixed at 1 USD. Similarly, Paxos Standard tokens, which have been formally approved by the New York State Finance Subcommittee, are designed so that 1 Pax is worth 1 USD. By linking the value of cryptocurrency to the value of fiat currency, the price can be kept stable, but other costs are incurred. In other words, you need to set aside enough dollars to cover the tether supply.

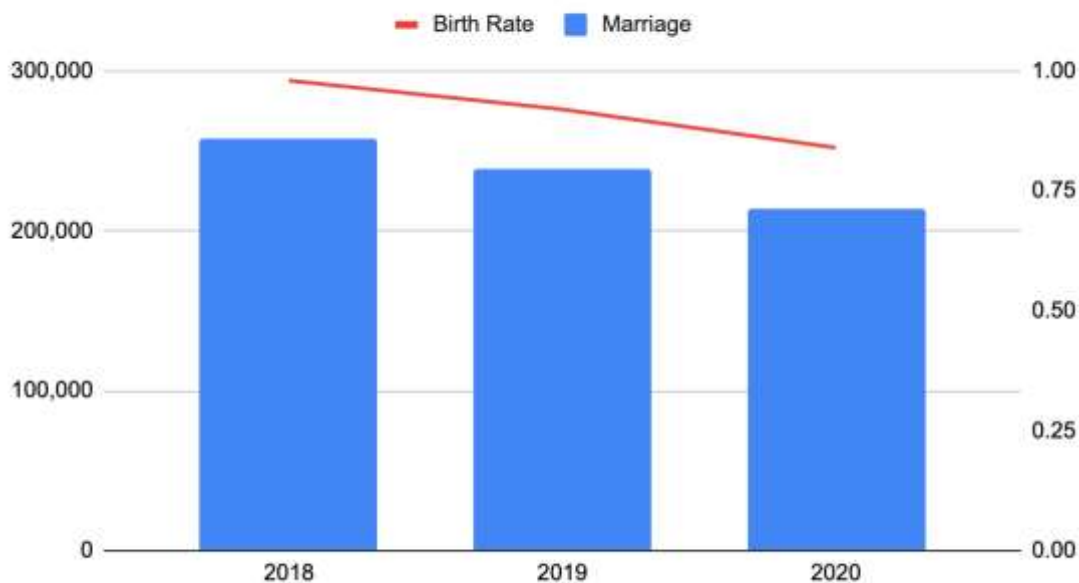
The Korean government and gaming companies can come up with the same economic system. Of course, they will have to use KRW instead of USD. We can use this as the key marketing factor. When stable coin which has an equivalent value of 1,000 KRW is provided as rewards across all P2E games created by Korean gaming companies a great economy will be created. Why using the same stable coin is beneficial is because it can create greater value because it is used across all games and because the reward is the same, the games will have to be purely fun to play. As mentioned earlier in this study, P2E games lack the game play quality. However, if the game developers must provide the same rewards, they will have to come up with good quality games to compete against other gaming developers in Korea.

The best thing about this co-venture with the Korean government and the Korean gaming industry coming up with the stable coin is the fact that the value of the KRW will increase as the popularity of the stable coin increases. KRW is comparably under rated compared to the size of the country's economy. Whenever there is a threat in the global economy, the KRW's value decreases sharply compared to other currencies. However, if we can have our Korean P2E games which are using Korean stable coins as mandatory, the demand for KRW will naturally increase. As the demand increases, the value will increase which will allow KRW to gain global presence and power. This will not only help the Korean game industry grow, but the overall economy to grow helping other industries when trading with other countries.

---

<sup>14</sup> <https://www.globenewswire.com/news-release/2022/07/26/2485687/0/en/Play-to-Earn-NFT-Games-Market-Worth-USD-2845-1-million-by-2022-2028-Opportunities-Challenges-Drivers-Trends-Key-Players-Regional-Analysis-Size-Shares-Developments-Types-Application.html>

## Marriage & Birth Rate



<Figure 5> Marriage and birth rates in South Korea

To add more to the strategic suggestion, the gaming companies in South Korea will have to appeal to the fact they have been very successful until now. Then, introduce the potential of the P2E market and why it is nowhere close to gambling. It will definitely help if they can stress the fact that the gaming industry in South Korea is responsible for many valuable jobs and they can hire many people in the younger generation. Of course, as mentioned many times before in this business project, this will help boost the marriage figures followed by the birth rate in South Korea<sup>15</sup>.

We all know that this is very very important to the country with the lowest birth rates in the world. This could be a good point to appeal to the members of Congress and the Game Rating and Administration Committee members. This theory can be backed up by birth rates in Japan. The total fertility rate of highly educated Japanese married women has increased for the first time in 19 years, and Japanese society is rejoicing. The real fertility rate is the average number of births a woman expects to have during her lifetime and is the most important indicator of population trends. Japan has struggled with population decline for over 30 years but has not found a proper solution.

According to the “Basic Survey of Birth Trends in 2021,” recently released by the National Institute of Social Security and Population Issues in Japan, the fertility rate for married women with a college degree or higher was 1.74. It increased from the previous survey in 2015 (1.66 people). From 2.21 people in 2002, it continued to decrease every time the survey was conducted, but it succeeded in rebounding for the first time in 19 years. In Japan, after actively introducing telecommuting and punctual work, the fertility rate rebounded to 1.74 in 2021. After working early at home and leaving work at 3 pm, the fertility rate rose to 1.97.<sup>16</sup>

This is one of the important reasons why the government should invest heavily in the gaming industry. Unlike other industries, employees who work for gaming companies can work from anywhere. Since COVID-19, I personally have been working remotely until this date. If people get to spend more time at home, they’ll get more chance to mingle with their families, and this will naturally increase the birth rates. And as mentioned above, this has been proven by the Japanese people. If the birth rate increases, this can not only save the future of South Korea but a lot of tax spent to elevate the birth rate. It

<sup>15</sup> [https://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT\\_1B8000G&conn\\_path=I2](https://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1B8000G&conn_path=I2)

<sup>16</sup> <https://n.news.naver.com/mnews/article/023/0003721895?sid=104>

is well known that the South Korean government has been spending exceptional amounts of tax money to increase the birth rate but it has rapidly fallen since the last government and doesn't look like it will increase in the near future.

## 2. Conclusions

Play-to-earn games have great potential. The first thing is it must be a well-made game in the first place. The gaming industry has a unique audience. There is fandom, love, and hate about the products the customers spend money on. The P2E model in gaming is very promising and has great potential. Recently, Google shut down its multi-million dollar project, Stadia. When it first came out, it looked like the future of games. We all thought that cloud gaming would take over the world and that conventional games would disappear. As a result, that wasn't the case. People in the gaming industry say that it's because Google doesn't understand the gaming nature. As mentioned earlier, gaming isn't like other online services that they can offer.

If a gaming company with a good understanding of games comes up with a very well-made P2E game, it will produce a lot of jobs for the younger generation and generate even more profit for the gaming companies. Addressed many times in this study, the Korean government should collaborate with the Korean gaming companies to create a stable coin that can be used in Korean P2E games as mandatory. If the games become globally popular, the demand of the in-game currency will increase. This means the increase in the value of the KRW which will make the currency more powerful. This will naturally benefit the competitiveness of the overall country.

For obvious reasons, this is a positive for the companies, employees, and the country. Therefore, the Game Rating and Administration Committee must remove its sanctions against P2E business model and allow more new business models to be applied to games. As I am doing my study on the P2E games, the chairman of Game Rating and Administration Committee has mentioned that they are aiming positive about allowing P2E games in South Korea. This announcement was made on the 13th of October 2022 at the inspection of the administration and this has led to an explosive increase in related stocks. At the meeting of the National Assembly's Culture, Sports and Tourism Committee the day before, Chairman Kim answered a question about P2E game regulation by Rep. Lee Yong-ho of the People's Power at the meeting of the National Assembly's Committee on Culture, Sports and Tourism the day before. Assemblyman Lee said, "The US and Vietnam already allow P2E games, and Japan and Singapore are also allowing them to be restricted. It should be given," he suggested. To this, Chairman Kim replied, "I'll be honest. I want to do it, too."<sup>17</sup>

However, there are still many things to be researched on. Especially, the stable coins are very difficult to maintain the stability. If the game doesn't find popularity and the demand of the stable coin declines, a lot of KRW will have to be put into the stable coin blockchain system to maintain its stability. This is not only a risk to the whole eco-system of the P2E games but the South Korean economy. As explained many times earlier in the study, the rise of the Korean P2E games when partnered with the Korean government will benefit a lot when it succeeds. However, on the other hand, when it fails to find popularity, it can be a loss to the economy as the value of the KRW will decline. Furthermore, there are still ongoing debates about whether the business model should be legal or remain illegal. There are a lot of opinions about why the game business model should not be allowed, so we will need to persuade them as well.

As we have read previously, most of the countries are considering P2E business models legal by taxing profit generated from the P2E business model. As a result, games like Axie Infinity has become a globally played P2E game and has generated more than \$215 million by mid 2021. Our South Korean government can apply similar regulations in the domestic market to give many Korean game companies a chance to enter the P2E gaming world. This will help our gaming companies grow even further to generate more stable jobs for the younger generation.

---

<sup>17</sup> <https://n.news.naver.com/mnews/article/015/0004762249?sid=101>

## **VI. Thanks to**

Thank you to those of you who have answered all my questions regarding the P2E business model and the gaming industry. Especially to the three members of KRAFTON, A, B, and C. It would have been great if I could address your names here but you all didn't want that to happen. As I am leaving KRAFTON soon, it was truly a great debate before by leave. Thank you all who have worked with me at KRAFTON. I really appreciate all your love and help.

Thank you to the Korean gaming industry. I have been working in the industry for a decade now and it has been a great journey so far. I've worked in both global and domestic gaming companies and learned a lot through working in many different environments. Also, I am a gamer as well. I love games, I like playing them, watching them, and thinking about them. Thank you, video games, for being there the whole time. I wish I could develop something that could create more fun and profit soon.

# References

I did not read any books because there are no books that talk about F2P games. However, I did take reference of many different news articles from around the globe. Here I am listing the articles that I read and took reference of. The rest of the ideas are from my career background along with colleagues.

- Absolute Reports – Play-to-Earn NFT Games Market Worth USD 2845.1 million by 2022-2028 : Opportunities, Challenges, Drivers, Trends, Key Players, Regional Analysis, Size, Shares, Developments, Types, Applications <https://www.globenewswire.com/news-release/2022/07/26/2485687/0/en/Play-to-Earn-NFT-Games-Market-Worth-USD-2845-1-million-by-2022-2028-Opportunities-Challenges-Drivers-Trends-Key-Players-Regional-Analysis-Size-Shares-Developments-Types-Application.html>
- Alyssa Exposito – Is Axie Infinity Legal? All About the Largest NFT Gaming Ecosystem <https://marketrealist.com/p/is-axie-infinity-legal/>
- Clara Zerbib - NFTs and Play-to-Earn: how to reach legal compliance? <https://www.orwl.fr/en/en-blog/nfts-and-play-to-earn-legal-compliance/>
- Eunji Cha - 게임위원장 "P2E 게임 허용 모색" 발언에 관련주 '급등' <https://n.news.naver.com/mnews/article/015/0004762249?sid=101>
- Hochul Sung - 새벽 재택근무 후 출근, 오후 3시 퇴근... 출산율 기적 일어났다 <https://n.news.naver.com/mnews/article/023/0003721895?sid=104>
- Jaewoong Roh - 유럽에선 이미 '도박' 판정... 입지 좁아지는 확률형 아이템 <https://www.edaily.co.kr/news/read?newsId=01167686628981352&mediaCodeNo=257>
- KOSIS - <https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT>
- KOSIS - [113\\_STBL\\_1023486&conn\\_path=I2](https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT_113_STBL_1023486&conn_path=I2)
- KOSIS - [https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT\\_113\\_STBL\\_1023486&conn\\_path=I2](https://kosis.kr/statHtml/statHtml.do?orgId=113&tblId=DT_113_STBL_1023486&conn_path=I2)
- KOSIS - [https://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT\\_1B8000G&conn\\_path=I2](https://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1B8000G&conn_path=I2)
- Kuihwan Oh - [특징주] 위메이드맥스, 국감서 P2E 게임 관련 언급에 급등 <https://n.news.naver.com/mnews/article/366/0000847351?sid=101>
- Lizzy Lawrence - South Korea cracks down on play-to-earn games <https://www.protocol.com/bulletins/south-korea-play-to-earn#:~:text=Lizzy%20Lawrence-,The%20South%20Korean%20government%20has%20asked%20Apple%20and%20Google%20to,before%20playing%2C%20Coin%20Telegraph%20reported>
- Matthew Perrotta - Business Models of Video Games: Past, Present, and Future <https://medium.com/@mjperrotta46/business-models-of-video-games-past-present-and-future-2b2aafe8ade1>
- Naver Finance - <https://finance.naver.com/item/frgn.naver?code=112040&page=2>
- Sungwoo Lee - 꿈수·편법으로 돌아온 P2E '무돌삼국지'... '넛 놓은' 게임위는 나몰라라 <https://www.techm.kr/news/articleView.html?idxno=102289>
- Vietnam Investment Review - <https://vir.com.vn/cleaning-up-legislation-for-nft-success-in-vietnam-92857.html>
- Vittoria Elliott - Workers in the Global South are making a living playing the blockchain game Axie Infinity <https://restofworld.org/2021/axie-infinity/>
- Wooyoung Choi - 미투은·미투젠 P2E 게임 '포켓배틀스' DAU 10만명 돌파 <https://n.news.naver.com/mnews/article/008/0004804081?sid=105>
- Youngsoo Mun - "사행성 재정의해 P2E 허용해야" 尹 정부에 전하는 게임 정책 제언 <https://n.news.naver.com/mnews/article/031/0000700691?sid=105>