

Koeder, Marco; Tanaka, Ema; Sugai, Philip

**Conference Paper**

## Mobile Game Price Discrimination effect on users of Freemium services– An initial outline of Game of Chance elements in Japanese F2P mobile games

14th Asia-Pacific Regional Conference of the International Telecommunications Society (ITS): "Mapping ICT into Transformation for the Next Information Society", Kyoto, Japan, 24th-27th June, 2017

**Provided in Cooperation with:**

International Telecommunications Society (ITS)

*Suggested Citation:* Koeder, Marco; Tanaka, Ema; Sugai, Philip (2017) : Mobile Game Price Discrimination effect on users of Freemium services– An initial outline of Game of Chance elements in Japanese F2P mobile games, 14th Asia-Pacific Regional Conference of the International Telecommunications Society (ITS): "Mapping ICT into Transformation for the Next Information Society", Kyoto, Japan, 24th-27th June, 2017, International Telecommunications Society (ITS), Calgary

This Version is available at:

<https://hdl.handle.net/10419/168503>

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**Title: Mobile Game Price Discrimination effect on users of Freemium services–  
An initial outline of Game of Chance elements in Japanese F2P mobile games**

Koeder, Marco<sup>1</sup>, Ema Tanaka<sup>2</sup> and Philip Sugai<sup>3</sup>

**Keywords:** Free-to-play, freemium, mobile games, lottery, behavior, attitudes, virtual goods, Japan

*Abstract: This paper offers a look at the Japanese mobile free to play market with a focus on “Gacha”, a game of luck mechanism used in many Japanese games. The paper tries to explain about the concept of Gacha, its different forms, some known regulation issues and briefly looks at player and professional’s insights and discusses an analytical framework for further studies to figure out the reason of player’s acceptance of price discrimination in F2P mobile games.*

## **Introduction**

With the increased penetration of smartphones, mobile gaming and smartphone based gaming apps have been on the rise globally. The mobile free-to-play (F2P) games space accounts for the major revenue within the global mobile apps economy. However, despite the popularity of these games, only 2% of users actually make in-game purchases (Swerve, 2016). Within the global mobile game market, Japan occupies a leading position in terms of revenues, generating \$6.2 billion dollars in 2016 and in terms of spending per player, where it ranks first in the world (SuperData Research, 2016). It has been suggested that one of the main drivers of revenues in the Japanese free-to-play mobile apps market is “Gacha”, a game-of-luck based payment mechanism. Gamers who use Gacha have been found to invest more money in mobile F2P games than those who do not play such games (Teramoto, Shibuya, and Akiyama, 2014). It means that payers of Gacha accept a kind of price discrimination in F2P even

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1 Graduate Student, GSAPS, Waseda University

2 Visiting Researcher, Waseda Institute for Digital Society and Chief Researcher, Foundation Multi-Media Communications (FMMC).

3 Professor , Doshisha University.

though the price is affected by luck, or setting of winning percentage by mobile game providers. Different from typical Western F2P games, where virtual items can be purchased directly through in-game currency with fixed price, Japanese games often feature a “Gacha” in the form of a refined lottery system where users choose to pay for a chance to enter a real-time “lucky draw” to acquire these items. In fact, the behavioral impact of Gacha upon Japanese game players has been so significant, that several controversies have erupted between developers, players and regulators in Japan because of its perceived relationship to over-spending. The Japanese F2P game market and Gacha has not been analyzed in detail in the English-language academic literature. (Some papers/work covering the topic: Askeloef, 2013; Kanerva, 2015; Yamakami, 2012b, 2013a, 2013b, 2014; Shibuya and Teramoto, 2015).

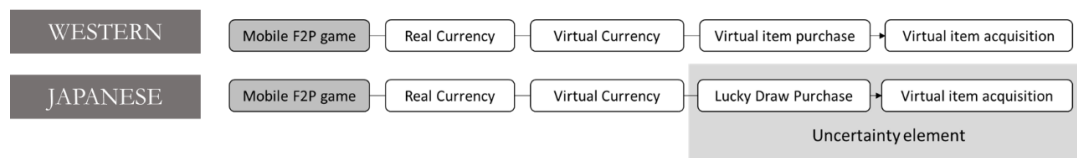


Chart 1: Difference between Western and Japanese F2P monetization: Adding the uncertainty element to virtual item acquisition.

## Research Question

From the game publisher side, it seems natural to adopt Gacha as a mechanism for price discrimination allowing them to maximize revenues from certain mobile game titles. Gacha mechanisms work well and they are deeply intertwined within Japanese mobile game design. From the user’s perspective, however, how the chance of luck element in virtual environment affects users is not well investigated. In other words, why some players pay more for Gacha drawing and others do not? From Economics standpoint of view, the same virtual item obtainable by Gacha has different value from players to players. To answer this question, this paper will depict the characteristics of Gacha based on Japanese mobile game market information and related regulatory and self-regulatory measures for consumer protection. Then this paper examines several analytical approaches and show issues and possibilities for further study. In that sense, this paper is a preliminary one for further research on how Gacha elements, game of

luck or artificial uncertainty to obtain virtual goods, affect usage and payment in freemium online services.

## **1 Gacha as a game of chance element in freemium services**

### **1-1 What is Gacha – gambling or lottery?**

According to previous studies, Gacha in online freemium services is similar to gamble. Shibuya describes Gacha as “...similar in screen appearance to vending machines that dispense children’s toys, and lucky players can win valuable gaming items this way...Gacha can be played for free, however, extremely rare and/or valuable gaming items can also be obtained through monetary purchases of online gacha products.” (Shibuya and Teramoto, 2015, Page 3). Yamakami describes it as “Japanese game vendors have made huge revenues using Gacha. Gacha is a kind of gambling for special items.” (Yamakami, 2013a, page 268) and also as “...a mechanism to provide a randomly picked item, sometimes free and sometimes as paid items. Gacha is a great framework to introduce gambling spirits into mobile social games. It also obscures the high price to premium items because one attempt of Gacha can be cheap.” (Yamakami, 2013b, page 738) or in more detail “a capsule container for a toy or a gadget...The price is one or two dollars. Before opening a capsule, its inner contents are not visible. Some of the contents come in a set, and therefore, users continue buying Gacha, trying their luck at getting a full set. Virtual Gacha for digital content is a popular revenue-generator in mobile social games. Sometimes, the content is an avatar, clothes for avatar, weapons, and so on.” (Yamakami, 2012a, page 1233).

Despite its similarity to gamble, Gacha could be understood as a lottery mechanism in a virtual world<sup>4</sup>. Gambling is about betting money or valuable assets to get higher

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<sup>4</sup> The origin of “Gacha” naming is a real toy lottery machine, “Gacha Gacha” or “Gacha Pon”, capsuled small toy lottery machine. Player of “Gacha Gacha” can turn the machine’s lever to get a capsule with several hundred yen (several dollar) per a turn. The sound of turning lever is like “Gacha Gacha” and the sound of opening a capsule is similar to “Pon”. Generally, Gacha Gacha toy is not sold in a store with

return than the betting amount. Gacha is about pulling a lottery to get randomly allotted items. At gambling, player will lose when they get less than their bet. At Gacha drawing, player will lose when they fail to get an item they desired. Therefore, in this paper, we would like to understand Gacha as kind of lottery mechanism. Actually, the Japanese government had regulated Gacha through the Law for Preventing Unjustifiable Extras or Unexpected Benefit and Misleading Representation. The law was enacted in 1962 to protect consumers from misleading labeling of goods and services (CAA, 1962).

## **1-2 What is Gacha – a lottery system of virtual items as prize / premium**

Lottery is common all over the world. Gacha, however, has several characteristics which are different from real world lottery: low cost for the production and replication of prize items, flexibility of probability setting and a limited scope of value restricted to the (in-game) online world. In the real world, there are many kind of lotteries, from government-run lotteries to marketing promotions which offer premium goods for winners, which are randomly selected from the applicants. The real world prize is more costly than virtual goods. As the prizes are real goods, the probability of winning is determined by the number of participants and prize goods. In virtual world, a virtual item could be tremendously rare to obtain by setting the probability nearly zero. The value of a virtual item is generally contextual. For example, a virtual game item is not usable in a different game no matter how rare and “valuable” the item is.

Real world lottery and virtual world lotteries like Gacha also have similarities: The variety of offerings of chances to get items. Both could be obtained through non-monetary and monetary ways. And the winning possibility is largely determined by the provider’s setting. Both are utilized as marketing promotion tools. Therefore there are several elements such as the selection of the winning prizes, probability to win and

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price tag. Therefore people who want a Gacha Gacha toy should try their luck by turning Gactha Gacha machine lever paying real money.

opportunity to participate in lottery which affects the design of the mechanisms of a lottery. By combining these elements, a variety of lotteries can be created.

### 1-3 Elements and variation of Gacha in Japanese mobile games

Looking at the literature, actual gameplay and mobile game analysis reports (Spicemart, 2016) Gacha can be seen as being composed of the following points:

- It is a key game element and not the game itself (1)
- It is paid for using an in-game virtual currency either by soft or hard currency (real money) (2)
- It is game of chance based (including advanced chance mechanics and probabilities) (3)
- It always provides a (virtual) reward (4)
- This reward (a virtual items) is
  - Collectable
  - non-monetary (no real money trading)
  - Available in different levels of rarity/limitedness
  - Offers are often combined with real time events (4)
- It is only of value within the game and it is an essential part of the game ecosystem (5)
- It is mostly used to increase monetization for the game provider (6)

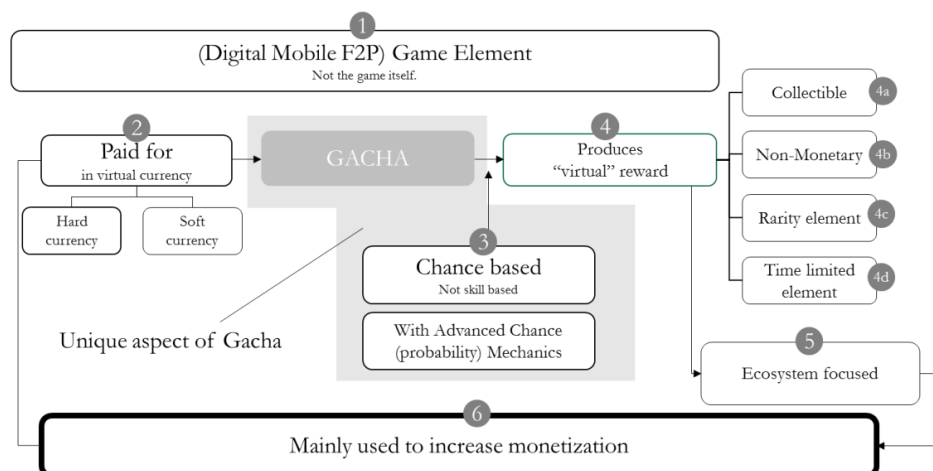


Chart 2: Outline of Gacha elements in Japanese mobile F2P games

There are several Gacha mechanics which are being used in Japanese mobile games. Our initial research in the literature, in reports and games and through interviews have shown over 10 different Gacha types/mechanics. Here is a small overview of some of them

- Kompu Gacha: Players need to acquire a set of items to unlock a special rare item (Banned in 2012 because of the issue of unknown probability)
  - Box Gacha: Virtual box of set items with known probabilities
  - Sugoroku Gacha: Combining Gacha with a boardgame. A Gacha acts like a dice which then allowed the player to move on a board to unlock special items
  - Redraw Gacha: Users can do a redraw of a Gacha (sometimes for free, sometimes for a fee)
  - Consecutive Gacha: Purchasing Gacha in bulk increases the overall probability of getting rare items
  - Open/Closed Gacha: A Gacha showing the probability of acquiring a specific item
  - Discounted Gacha: Special campaigns where users pay less for a gacha draw.
- (Sources: Yamakami, 2012b; Teramoto, Shibuya, and Akiyama, 2014; Spicemart Report, 2016; Toto, 2016; Interviews; Gameplay)

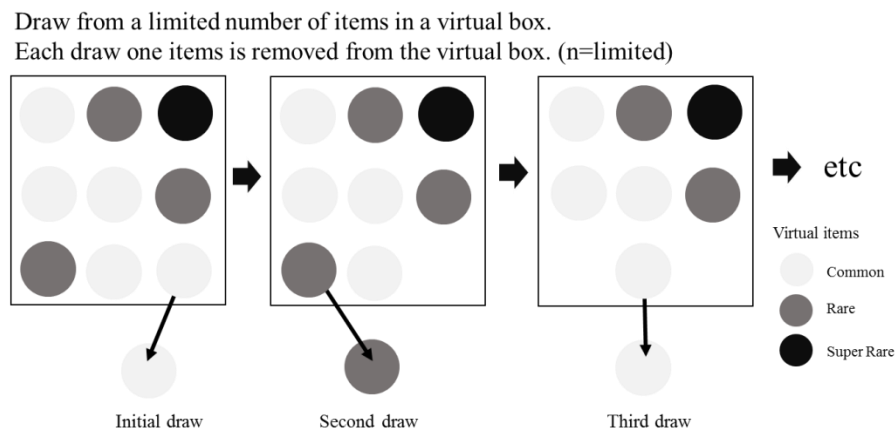


Chart 3: Example of Box Gacha Mechanics

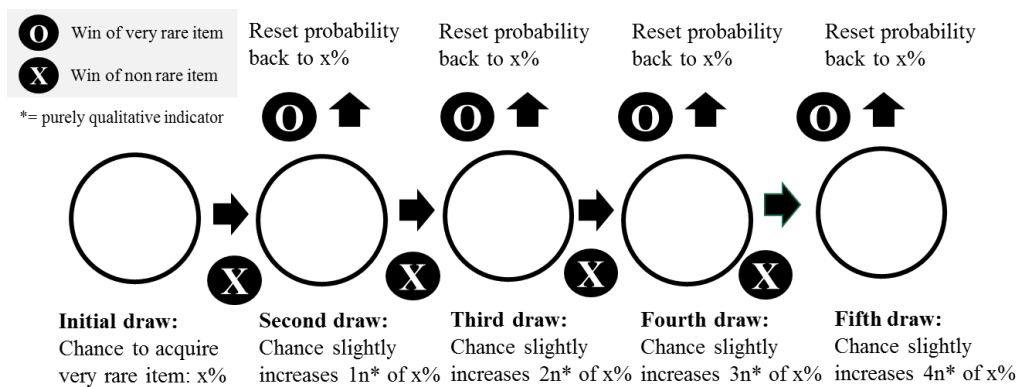


Chart 4: Example of Consecutive Gacha Mechanics

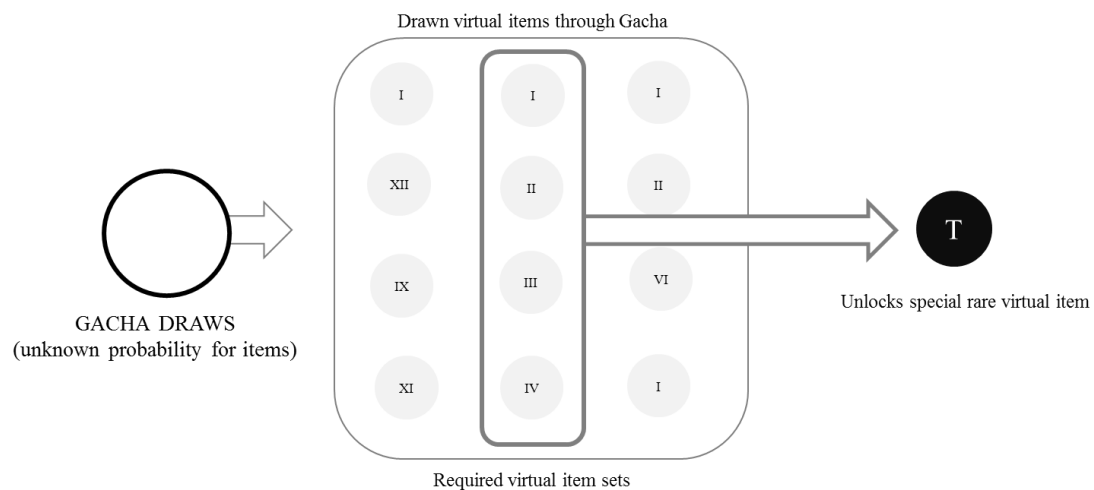


Chart 5: Example of Kompugacha Mechanics (now banned)

## 2 How Gacha became controversial and (self-) regulated in Japan

### 2-1 Kompu-Gacha regulation by Law

Despite the fact that Gacha has existed in mobile games in Japan since around 2004 with one of the first games being Maple Story. (4Gamer 2007), complains to the Consumer Agency in Japan had increased in 2011 (Machia, 2012). The main issue was the so called mechanics of “Kompugacha” which had been previously mentioned in the paper. The name comes from the word KOMPURETO which means “to complete”. This mechanics require the player to first collect a series of items (complete set) before being able to unlock a specific rate item. ~~Without any known data on the probability, rarity or potential costs of acquiring the final item the Consumer~~ The Consumer Affairs

Agency in Japan (CAA) banned the practice of “Kompugacha” in 2012 for the reason that it corrupts the game experience as the system makes it difficult to understand the probability to win a prize (CAA, 2012). Game companies had to abandon these mechanic and switched to other kind of Gacha and invented new ones. Over the course of time game developers introduced several new Gacha mechanics several of them with hidden probabilities and hidden total costs for acquisition by just hinting how rare some items are.

## **2-2 Probability self-regulation by guideline**

Then in 2015 another Gacha related issue became public this time associated with a specific game (Grandblue Fantasy) and its lack of providing correct probabilities/costs for acquiring specific items (Nakajima, 2016). As a reaction to this, the Association of Japanese game developers (CESA) issued a guideline in 2016 asking their members to provide more transparency for Gacha mechanics within their games. The guidelines require game makers to implement one of the following 4 standards:

- a. The limit on the estimated price (the price calculated as an expected value according to the set distribution rate) to obtain any rare Gacha item should be within 100 times the price of a single paid Gacha, and in the case that this limit is exceeded, that estimated price or its multiplying factor is to be displayed on the Gacha page.
- b. The estimated price limit to obtain any rare Gacha item should be within 50,000 yen, and in the case that this limit is exceeded, that estimated price is to be displayed on the Gacha page.
- c. The upper limit and lower limit of distribution rates for rare Gacha items are to be displayed.
- d. The distribution rates for each type of rare Gacha item are to be displayed.

(Spicemart 2016, p.6)

By this self-regulation, member game companies only had to fulfill one of above conditions since it did not require to adhere to all of them.

### **3 Analytical Framework consideration**

#### **3-1 Previously applied frameworks in the virtual item / F2P context**

In the field of (Western) Free-to-play games and virtual item purchase several analytical frameworks have been applied so far in studies. The most frequent being the Technology Acceptance Model (Davis, 1989; Davis, Bagozzi, Warshaw, 1989) which can be found in several studies on virtual item purchases (Mäntymäki, Salo, 2011; Shin, 2008; Cheon, 2013; Hsu, 2004) and the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, Davis, 2003) which had also been utilized for virtual world and virtual item purchases (Mäntymäki, Salo, 2013; Guo, Barnes, 2011; Guo, Barnes, 2012) followed by papers applying a value based theory framework. (Han, Windsor, 2013; Kim, Gupta, Koh, 2011; Park, Lee, 2011).

The role and function of virtual items have been outlined by several authors such as Lin and Sun talking about their roles as functional tools and decorative tools (Lin and Sun, 2007) or Lehdonvirta dividing them into separate categories based on functional, emotional, and social attributes. (Lehdonvirta, 2009)

Virtual items and virtual worlds have also been studied recently more from an economic perspective leading to the concept of virtual economies put forward mainly by Castronova and Lehdonvirta. According to them a virtual economy can be analyzed as good as a real economy. Users treat virtual good similar to real goods and real money. (Lehdonvirta, Castronova, 2014).

Yet these above studies have not covered Gacha and its possible effects because research has been mostly focused on Western game titles. Given the uniqueness of Gacha 3-1 Price discrimination for maximizing profit – game developer side

#### **3-2 Behavioral economics and probability weighting function**

One of interesting theoretical angles comes from Behavioral Economics on lottery analysis. The topic of Behavioral Economics bias elements and how they might impact (mobile) free to-play-games have already been briefly outlined by Hamari. (Hamari, 2011) and have been discussed for the games/mobile app environment (Paavilainen et

al., 2013;Reiners & Wood, 2015; Stockinger et al., 2015; Heimo, Harviainen, Kimppa, et al., 2016; Zagal et al. 2013) As these thoughts are based on Western games, they did not look at Gacha game of chance elements. On the other hand, Behavioral Economics have shown that game of chance/lottery elements in general can help change or enforce a behavior better than fixed incentives. (Kearney, Tufano et al, 2010; Kimmel, Troxel et al, 2012; Goette, Stutzer, 2008; Nvqvist, Corno, et al. 2015; Volpp, Troxel, et al. 2008) Basically, Behavioral Economics explains the reason of lottery buying through the “probability weighting function”(Gonzalez, Wu, 199). Gacha, however, is different from lottery as payers seem to value rarity or collectability of the virtual items itself which could be obtained by Gacha. Game players might be less inclined to pay for acquiring specific items or content when they are associated with Gacha mechanisms rather than a fixed price. On the other hand, as Gachas have a rarity element which makes a virtual item more attractive for players. Additionally, probability of Gacha for a certain item is not static but changeable by game providers. How this kind of artificial probability and rarity could affect users’ needs more analysis as serious research has just started for its short history.

How Gacha is perceived by players and game professionals provides another interesting opportunity to look at the topic.

#### **4 Gacha perception by users and developers**

Interviews with Japanese players and professionals in English academic literature are rare. (For example in the thesis by Askeloef, 2013; Kanerva, 2015)

Over a period of 12 months the authors have talked to several Japanese mobile game players, mobile game developers and mobile game analysts in Japan to understand better about the role of Gacha.

An insightful interview was with a Japanese male in his 50s who -according to this own statement- was spending over 100,000 Yen per month on Gacha in mobile games. When asked why he is spending this amount of money he mentioned that Gacha is a self-rewarding experience for him that helps him to unwind and that he would feel less excited about Gacha if it was free of charge. He does not care about looking at the

probability of acquiring a specific item. But he also mentioned that he is becoming tired of Gacha as he proceeds in the game and acquires rare items as there is not so much to look forward to anymore.

On the contrary a player in his 30s pointed out that he is not willing to pay for Gacha at all. He saw Gacha as a tool to try his own luck and he gets excited about the upcoming result and it makes him feel good to acquire a rare item by chance. If he was to pay for it he wanted to know the chance of winning specific items.

According to a Japan market mobile F2P game analyst Gacha is used mainly for increasing the spending of the few paying players and the different Gacha mechanics and frequent new (rare) item content combined with in-game real time event helps to increase the spending.

A game developer emphasized that Gacha, game design and payment are closely intertwined and cannot be separated. He called it ‘The holy trinity’ of F2P game design in Japan”. He also stressed that Japanese players want Gacha in their games as an extra level of entertainment. Without the Gacha element, item acquisition would lose its attractiveness.

Additionally, another developer, game designers take a lot of hints from pachinko for Gacha. Lights, mechanics that announce something will happening are important. Especially exciting animations before special results. The top monetizing games feature very elaborate Gacha animations. Visual feedback and visual experience is important to players. He stressed that Gacha animations are for heavy spenders only usually. Also if players purchase Consecutive Gacha (for example 10 gacha in a row) the Gacha animation is also different.

## **Summary**

Free to play mobile games are based on a business model which allows the majority of players to play the game for free while only a small percentage (2-5%) is actually paying for the game (mostly through the purchase of virtual in-game items). This requires the game providers to focus on the monetization of a small group of users.

Gacha has been outlined as one of the key drivers for this monetization in Japan. While some Gacha draws do not require the payment of real money, some do.

In the eyes of several Japanese researchers Gacha can be seen as a virtual lottery system. Different from a real lottery it offers a flexible probability, the virtual prizes items can be expanded and reproduced at very low costs and only have a value within the game ecosystem. Similar to real lotteries there are free and paid options and the provider sets the probability of winning and the range of items to be won.

Because of its virtuality it is possible to develop and experiment with many different types of Gacha mechanics to help increase the games monetization. Some of them without providing any probability of winning/acquiring a specific item.

These mechanics have lead to issues and intervention from regulators. In terms of regulation for Gacha, Japan moved from regulatory to self-regulatory activities.

Game developers and analysts see Gacha as a fundamental element of Free to Play mobile games in the market helping to monetize these games and there are players who spend considerable amounts of money for Gacha.

There are already several frameworks which have been applied to virtual items, F2P games and virtual worlds already. Gacha has not been considered in these studies. In the free to play game context Behavioral Economics has been briefly discussed to help explain some of the behaviors of players. Given the lottery mechanics of Gacha, applying behavioral economics can add a new angle to the discussion and also the discussion of lottery mechanics in general. (Rarity elements, variable probability, etc)

### **Further analysis and discussion**

This paper just gives a preliminary overview of Gacha and the different angles involved from the Gacha mechanics side and its uncertainty element, the regulatory side, developers side and players side and how Gacha could affect freemium online services.

I future papers these different items should be looked at more closer in combination with more quantitative data analysis. Given the fact that recently Gacha is also gaining

momentum in the West due to the launch of several Japanese mobile games titles with Gacha elements it would be interesting to take a closer look at the regulatory angle and how this could inspire or impact regulation or self-regulation in Western markets. Also the discussion of Gacha as a gambling mechanism could be worth investigating further in this setting from a Western perspective.

Another angle that should be investigated further is the effect of Gacha on players attitude and behavior as this can help to shed more light on the underlying causes of its impact from a consumers perspective.

## Bibliography

- 4Gamer (2007) Interview with Maple Story CEO Lee Seung-chan (in JP), 4Gamer.net, Retrieved from <http://www.4gamer.net/specials/maplestory/maplestory.html>
- Alha, K., Koskinen, E., Paavilainen, J., Hamari, J., & Kinnunen, J. (2014). Free-to-Play Games: Professionals' Perspectives. Proceedings of Nordic DiGRA.
- Askelöf, P. (2013). Monetization of Social Network Games in Japan and the West. Lund University, Faculty of Engineering, LTH. Retrieved from <http://lup.lub.lu.se/student-papers/record/3458984/file/3458992.pdf>
- Cheon, E., (2013) Energizing business transactions in virtual worlds: An empirical study of consumers' purchasing behaviors) Information Technology and Management, 14 (4), (pp. 315-330)
- Consumer Affairs Agency, (1962), Law for Preventing Unjustifiable Extras or Unexpected Benefit and Misleading Representation (in JP), Retrieved from [http://www.caa.go.jp/policies/policy/representation/fair\\_labeling/](http://www.caa.go.jp/policies/policy/representation/fair_labeling/)
- Consumer Affairs Agency, (2012, April 18th), Regarding the Compliance of Online Game (in JP), Retrieved from [http://www.caa.go.jp/representation/pdf/120518premiums\\_1.pdf](http://www.caa.go.jp/representation/pdf/120518premiums_1.pdf)
- Davis, F. D.; Bagozzi, R. P.; Warshaw, P. R. (1989), "User acceptance of computer technology: A comparison of two theoretical models", Management Science, 35, (pp. 982–1003)
- Goette, L., & Stutzer, A. (2008). Blood donations and incentives: Evidence from a field experiment, (IZA Discussion Paper No: 3580), 1–34
- Hamari, J. (2011). Perspectives from behavioral economics to analyzing game design patterns: loss aversion in social games. In CHI 2011, May 7–12, 2011, Vancouver, BC, Canada. (p. 6).

- Gonzalez, R., Wu, G. (1999) On the Shape of the Probability Weighting Function, *Cognitive Psychology*, Vol 38, (pp. 129 – 166)
- Guo, Y., Barnes, S. (2011) Purchase behavior in virtual worlds: An empirical investigation in Second Life, *Information and Management*, 48 (7), (pp. 303-312)
- Guo, Y.U.E., Barnes, S.J. (2012) Explaining purchasing behavior within world of Warcraft, *Journal of Computer Information Systems*, 52 (3), (pp. 18-30)
- Han, B., Windsor, J. (2013) An investigation of the smartphone user's in-game purchase intention *International Journal of Mobile Communications*, 11 (6), (pp. 617-635)
- Heimo, O.I., Harviainen, J.T., Kimppa, K.K. et al. (2016). Virtual to Virtuous Money: A Virtue Ethics Perspective on Video Game Business Logic, *Journal of Business Ethics* (2016). (pp. 1–9).
- Hsu, C. L., & Lu, H. P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & management*, 41(7), (pp. 853-868).
- Kanerva, T. (2015). *Virtual Worlds Apart A Comparative Study on Digital Games in Japan and the West*. University of Helsinki.
- Kearney, M. S., Tufano, P., Guryan, J., & Hurst, E. (2011). Making Savers Winners: An Overview of Prize-Linked Saving Products. *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, (July 2016).
- Kim, H.-W., Gupta, S., Koh, J. (2011). Investigating the intention to purchase digital items in social networking communities: A customer value perspective, *Information and Management*, 48 (6), (pp. 228-234)

- Kimmel, S. E., Troxel, A. B., Loewenstein, G., Brensing, C. M., Jaskowiak, J., Doshi, J. A., ... Volpp, K. (2012). Randomized trial of lottery-based incentives to improve warfarin adherence. *American Heart Journal*, 164(2), 268–274.
- Lehdonvirta, V. & Castronova, E. (2014). *Virtual Economies: Design and Analysis*. Cambridge, MA: The MIT Press.
- Lehdonvirta, V. (2009). Virtual item sales as a revenue model: Identifying attributes that drive purchase decisions. *Electronic Commerce Research*, 9, (pp. 97–113).
- Lin, H., & Sun, C.- T. (2007). Cash trade within the magic circle: Free-to-play game challenges and massively multiplayer online game player responses. In *Proceedings of DiGRA 2007: Situated Play*, (pp. 335–343).
- Machida, Toru (2012, June 5) “Konmei suru Kompu Gacha no sinsou”, Gendai Business web article. Retrieved from <http://gendai.ismedia.jp/articles/-/32713>
- Mäntymäki, M., Salo, J. (2011) Teenagers in social virtual worlds: Continuous use and purchasing behavior in Habbo Hotel, *Computers in Human Behavior*, 27 (6), (pp. 2088-2097).
- Mäntymäki, M., Salo, J. (2013) Purchasing behavior in social virtual worlds: An examination of Habbo Hotel, *International Journal of Information Management*, 33 (2), (pp. 282-290
- Nakajima, Y. (2016, March 10th) \$6,065 Spent in One Night Shows Dark Side of Japan's Mobile Games, *Bloomberg.com*. Retrieved from <https://www.bloomberg.com/news/articles/2016-03-09/-6-065-hunt-for-blonde-avatar-exposes-dark-side-of-japan-gaming>
- Nyqvist, M. B., Corno, L., De Walque, D., & Svensson, J. (2015). Using Lotteries to Incentivize Safer Sexual Behavior Evidence from a Randomized Controlled Trial on HIV Prevention, (March).

- Paavilainen, J., Hamari, J., Stenros, J., & Kinnunen, J. (2013). Social Network Games: Players' Perspectives. *Simulation & Gaming*, 44(6), 794–820.
- Park, B.-W., Lee, K.C. (2011) Exploring the value of purchasing online game items, *Computers in Human Behavior*, 27 (6), (pp. 2178-2185).
- Reiners, T., & Wood, L. C. (2015). Applied Behavioral Economics: A Game Designer's Perspective. *Gamification in Education and Business*, 81–104. <http://doi.org/10.1007/978-3-319-10208-5>
- Shibuya, Akiko Mizuha Teramoto, A. S. (2015). Systematic Analysis of In-game Purchases and Social Features of Mobile Social Games in Japan 1. In *DiGRA 2015: Diversity of Play* (pp. 1–16).
- Shin, D.H. (2008) Understanding purchasing behaviors in a virtual economy: Consumer behavior involving virtual currency in Web 2.0 communities, *Interacting with Computers*, 20 (4-5), (pp. 433-446)
- Spicemart (2016), Japan Market Trend Report March 2016 - English Version
- Stockinger, T., Koelle, M., & Lindemann, P. (2015). Towards Leveraging Behavioral Economics in Mobile Application Design. In *Gamification in ....* Retrieved from [http://link.springer.com/chapter/10.1007/978-3-319-10208-5\\_6](http://link.springer.com/chapter/10.1007/978-3-319-10208-5_6)
- Teramoto, M., Shibuya, A., and Akiyama, K. (2014). Game playing motivations and micro- transactions: A mobile-Internet survey on social game players,” in *Proceedings of the 2014 Spring Conference of Japan Association of Simulation and Gaming (JASAG)*
- SuperData Research (2016) Asia Mobile Games Report 2016. Retrieved from <https://www.superdataresearch.com/market-data/asia-mobile-games/>

Swrve (2016). The Swrve Monetization Report. Retrieved from <https://www.swrve.com/images/uploads/whitepapers/swrve-monetization-report-2016.pdf>

Toto, S. (2016, March 30th) How Japanese Mobile Game Makers Gio After Whales, Gamasutra.com, Retrieved from [http://www.gamasutra.com/blogs/SerkanToto/20160330/269206/How\\_Japanese\\_Mobile\\_Game\\_Makers\\_Go\\_After\\_Whales\\_5\\_Popular\\_Gacha\\_Mechanics.php](http://www.gamasutra.com/blogs/SerkanToto/20160330/269206/How_Japanese_Mobile_Game_Makers_Go_After_Whales_5_Popular_Gacha_Mechanics.php)

Venkatesh, V.; Morris, M. G.; Davis, G. B.; Davis, F. D. (2003), "User acceptance of information technology: Toward a unified view", MIS Quarterly, 27 (3), (pp. 425–478)

Volpp, Kevin G., Leslie John, K., Andrea B. Troxel, Laurie Norton, Jennifer Fassbender, and George Loewenstein (2008). 'Financial Incentive-Based Approaches for Weight Loss.' Journal of the American Medical Association, 300 (22): 2631-37.

Yamakami, T. (2012a). Revenue-Generation Pattern Analysis of Mobile Social Games in Japan. In Advanced Communication Technology (ICACT), 2012 14th International Conference (pp. 1232–1236).

Yamakami, T. (2012b). Anomaly of Mobile Social Games: Lessons Learned in the Hype of Japanese Mobile Social Games. In Computing and Convergence Technology (ICCCT), 2012 7th International Conference on (pp. 198–202).

Yamakami, T. (2013b). Historical view of mobile social game evolution in Japan: Retrospective analysis of success factors. Advanced Communication Technology (ICACT), 2013 15th International Conference, 735–739,

Yamakami, T. (2013a). Cross-Culture Analysis of Mobile Social Games: Toward Design Guidelines of Lessons Learned from Globalized Mobile Social Games. In 2013 International Conference on Cloud and Green Computing (pp. 266–270)

- Yamakami, T. (2014). Dilemma of Service Engineering in the Era of Social Services: Understanding the Ongoing Challenges of Service Engineering. In 2014 17th International Conference on Network-Based Information Systems (pp. 633–637). IEEE. <http://doi.org/10.1109/NBiS.2014.59>
- Zagal, J. P., Björk, S., & Lewis, C. (2013). Dark Patterns in the Design of Games. FDG 2013 - 8th International Conference on the Foundations of Digital Games, 1(312), 39–46.