

FREEMIUM ECONOMICS IN MOBILE GAMES

Bachelor's Thesis
Vesa Pulkkinen
Aalto University School of Business
Department of Economics
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Author	Vesa Pulkkinen	
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Abstract

Freemium economics is a growing field of economics that is mainly applied to information goods. The product is offered free of charge, but with in-app purchases the player can gain access to premium content. This can also be seen as second-degree price discrimination, also known as versioning, where two or several versions of the same basic product are made.

In case of mobile games, behavioral economics can give some valuable insight on how the versioning can be actually implemented. Game companies can design different kind of game mechanics that will make the player behave in a wanted way.

Keywords Freemium, Price Discrimination, Versioning, Behavioral Economics, Sunk costs, Attention Economy

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Figure 1: The Development of Finnish Game Industry's turnover (millions of euros)
(Neogames 2016)

Introduction

Nowadays video games are considered to be a vital part of global entertainment industry, and a growing amount of people are turning to mobile games in order to keep themselves entertained. Thanks to mobile gaming, more and more people are considered to be gamers. It is no longer a hobby of teenage boys, as seen before, but gamers can be found in all kind of groups of people. This also means that even more revenues are generated within the game industry. As seen in figure 1, the Development of Finnish game industry's turnover has grown intensively over the past eight years.

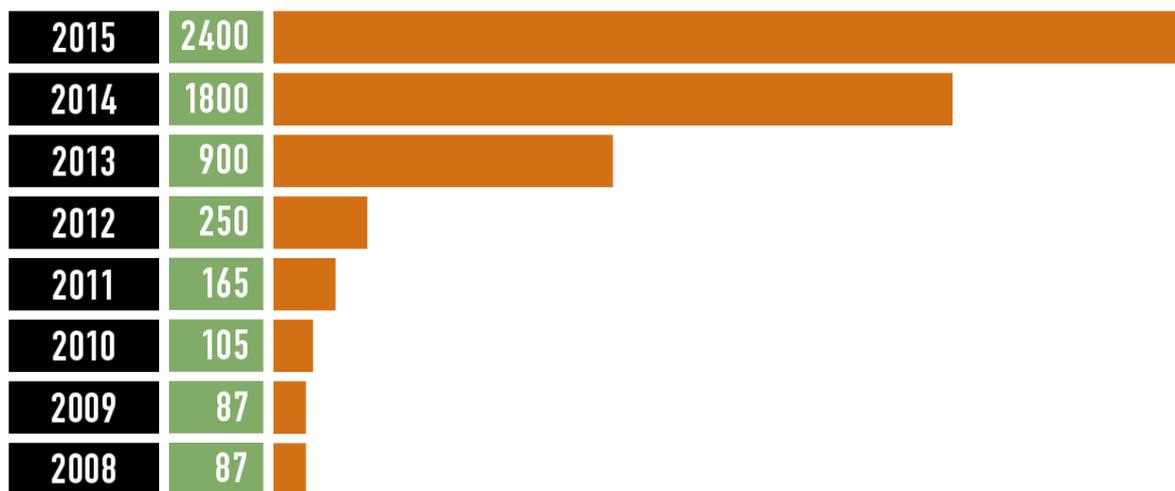


Figure 1: The Development of Finnish Game Industry's turnover (millions of euros) (Neogames 2016)

The popularity of mobile gaming is very much affected by the fact that most of the games cost nothing to play. Instead, the games use advertising or premium in-game purchases as means to generate revenues. This kind of pricing strategy is called freemium, which consists of the words free + premium. This kind of pricing has been found out to be very effective when concerning virtual goods. Perhaps surprisingly, some of these free games actually make more revenues than their paying counterparts.

The goal of this thesis is to discover why a significant part of games are offered for free and how the pricing affects the design of games in general. In this thesis I will answer the following questions: What does a freemium pricing strategy mean in the context of mobile games, and how does this pricing strategy affect the overall game design? To answer these questions, I have conducted a literature review of the subject, which has been studied quite extensively over the last years.

In this thesis, “player” are often mentioned. In this context, they have the same meaning as “consumer” in regular economic text, but a player is a consumer of a specific market of games. “Developers” or “game companies” in the context of this thesis refer to the producers in traditional economics.

Mobile games as economic systems

Video games refer to all kinds of digital games. They are nowadays usually digitally distributed, e.g. downloaded from the Internet via a third party application. Video games can be played with all kinds of platforms, like PCs or large game consoles like Playstation or XBox. Mobile games, on the other hand, refer to games that are used on mobile platforms, such as smart phones and tablets computers. The mobile games can be played in longer sessions like traditional computer games, but more often they are played in shorter periods of time while the player is on the go. For example, people can play games while commuting to work or school. Because of this, opening the game and playing cannot take much time, that is, the game sessions need to be short.

Mobile games are part of what is called an information economy. It refers to the industries, which primarily produce, distribute and process information. This term can also refer to the fact that all industries use information and information technology increasingly often. (Belleflamme 2005). In information economies the exchanges happen in a virtual context, so every online marketplace, virtual game and virtual services are considered to be virtual economies. Information goods, or virtual goods, refer to the products that are mainly in digital format, and nowadays most often distributed via Internet (Seufert 2014). Books, web pages, professional softwares and mobile games all fit the description.

What virtual goods often have in common is that they most often have high fixed costs, but their marginal costs are costs are often zero, or at least very close to it (Belleflamme 2005). Producing 10 000 copies of a mobile game generally cost the same as producing 10 copies. This means that traditional cost-based pricing is not a viable pricing solution with virtual products, and the sellers must instead utilize value-based pricing, where an information good is priced according to the buyers willingness to pay instead of production costs (Belleflamme 2005). Since the buyers’ willingness to pay often varies greatly, many different versions of the same product are made. For example, Microsoft often makes different Professional and Home versions of its current Windows release, and therefore prices the professional version considerably higher. Of course, the Professional version must have some features that the Home version does not.

Mobile games are downloaded from operation system dependent online marketplace, like App Store in the case of iPhones or Google Play in case of Android phones, which are the two most popular platforms for distributing. Developers usually do not publish the game themselves on their website, but distribute it via App Store or

Google Play. This kind of distribution system is called a two-sided market, which is in this case controlled by platforms. (Lehdonvirta & Castronova 2014)

In traditional microeconomic setting, when consumers buy games, they compare the price of the game to their own appreciation of the game. For example, if a game costs 60 €, the players will only purchase the game if their willingness to pay is higher.

When a mobile game is free-to-play, player's valuation of the game will most likely be higher than the price of 0. Still, that is not necessarily the case: The subject of the game might be so forbidding that the players might not enjoy playing it at all, which means that their willingness to play would be a negative number. If the players' willingness to pay is higher than 0, they are willing to try the game and download it from App Store.

Freemium pricing strategy

The reason why people spend money on video games does not differ much from the lessons learned from conventional microeconomics. If the people value the games more than their price is, they might be willing to purchase it. Video game is a virtual good, and people spend money on them similarly as to real, physical goods (Lehdonvirta & Castronova 2014). Basic economic principles of supply and demand work similarly for virtual goods. The main difference is, obviously, that virtual goods do not have any marginal costs.

Besides the freemium pricing strategy, other common pricing strategies for games can include:

- Upfront price, where the price is often fixed and paid before using.
- Subscription based business model, where there is a monthly fee
- In-game advertising, where the players must watch advertising while gaming

In earlier ages, game companies used to hand out working demo versions of games, which gave the player a feel of the product, but it couldn't actually be played that much. This is often called feature-limited business model. Nowadays with freemium games, players can play the basic game and get basically the whole game experience.

Pricing is a crucial part of product, since it affects the revenues of the company, and also affects surpluses that the consumers and producers get. Freemium pricing is sometimes regarded as price discrimination (Lehdonvirta & Castronova 2014), where consumers use the same basic product with different prices.

In freemium economics, the basic product is given to the customer for a price of 0. When there are enough consumers using the product, some will eventually want to purchase some of the premium content. Consequently, although giving the basic product for free, companies are still able to achieve large revenues if the scale is high enough. Even when most of the users will never pass beyond the price point of 0, this is true. This phenomenon is often called the 5 percent rule: Only a maximum of 5 percent of the users are willing to spend extra money on a freemium product (Seufert 2014). Still, with enough users, the product itself can be highly profitable. If the

product is appealing enough, and there are chances to spend either a few large or repetitive small purchases, a proportion of the users will spend money on the product (Seufert 2014).

The players all have different kind of valuations for the game, some have relatively low valuation and some have considerably high. In order to make price discrimination work properly, the producer of the game should offer more features according to the player's willingness to pay for the game. Since the group of players spending money on the game can be quite small and varied, it is often a good idea to offer them a variety of differently valued options to buy.

Since it is crucial to gather a critical mass of users, it can be argued that the good itself has to be desirable for many users. Serving a tiny niche audience is probably not the most effective strategy. Since people have different kinds of valuations for the product, there should also be many different price tags on the product. A tiny minority of users will spend many times more money than rest of the people that belong to the 5 percent. These people are referred as the whales in the gaming industry, and they generally spend more than 500 dollars on a product during its lifespan.

Purchases made by whales make up most of the revenues of a single mobile game, and sometimes game designers come up with content specifically made for the whales. The price of this premium content is often considerably - even ridiculously - higher than other premium contents. Even then, the content must be something so valuable that the whales are willing to pay for it.

When a game producer is choosing the right pricing strategy for their company, the key characteristics of the game should be considered. In order to succeed as a freemium game, the game itself does not have to have an enormous user base. Instead, the key factors are low marginal costs in distribution and production.

Evidently, it seems that freemium strategy is more profitable than a fixed price strategy. Liu et al. (2012) found out in their study on Google Play apps that the freemium mobile games generally make more revenues than their paid counterparts. The study also showed that the revenues of the free version were positively correlated with the ratings given by the users in Google Play.

Game reviews are obviously important also for paid applications. Besides all the marketing material provided by the developer, they are probably the only source of information about the quality of the product. When there are enough reviews, this information can even be considered to be quite reliable.

To conclude, freemium games can generate higher revenues, but in order to succeed, they must be considerably good. Otherwise the players would not keep playing the game., and therefore will never do in-app purchases. Freemium games generally need to be better made in order to attract attention and to make revenues. Based on this it can be assumed that freemium pricing strategy can eventually lead to better games being made, meaning that much thought has been given to their inner mechanics. However, this doesn't mean that the games are more fun to play, but quite the opposite.

Price Discrimination in Mobile games

As said earlier, freemium economics can be considered as price discrimination, which refers to a pricing strategy where the same product or variants of the same product is sold to buyers at different prices. When it is impossible for the seller to identify the buyers' willingness to pay, it is often a good idea to offer the product in several different prices. For this strategy to work, the product must not be re-sellable (or it has to be really hard), since the persons getting the cheaper price would end up selling their products for only a slightly higher price for the persons with higher willingness to pay, resulting in lesser profits for the original seller. In other words, the arbitrage costs must be considerably high (Belleflamme 2005).

Pigou (1920) identifies three types of price discrimination, according to the fact how much the sellers know about the buyers. In first-degree price discrimination, the sellers know the buyers' preferences thoroughly, and are able to price the products according to the buyers' willingness to pay, and therefore consuming all the consumer surplus available. This kind of pricing is extremely hard to carry out with all the information it requires. The companies are collecting more information about their customers. With the help of information technology they have a better understanding of the customers' tastes and willingness to pay. (Belleflamme 2005). The third-degree price discrimination is called a group price discrimination,

Versioning, also known as second-degree price discrimination, is a widely used pricing strategy in the information economy. When the company does not precisely have information on customers willingness to pay, using versioning can still lead to gaining some of the excess consumer surplus.

Belleflamme suggests a simple model for versioning, where the consumer's utility function is as follows:

$$U(\theta, s_i) = k + \theta s_i - p_i$$

Where

U = Net utility

θ = Valuation of the product

s_i = Quality of the product

p_i = Price

k = Valuation of other dimensions of the product

Simply put, the consumers will get utility from a high quality product, affected by the consumer's own valuation of the product. The price of the product will lower that utility.

Belleflamme (2015) demonstrates the different branches of versioning, which include bundling, functional degradation and conditioning prices on purchase history. In mobile games, the games have basically gone through functional degradation: The

game is made worse than it actually could have been done. This is done to make the game less valuable, so that some players would be willing to pay for the premium content in the game, which will make the game considerably better.

This damaged good strategy (Belleflamme 2005) is a widely used strategy on software markets. The producer produces a full quality version of the product, and then makes another version with lower quality. Making a damaged good can cost more money than making only a high quality product, but in order to practice price discrimination, it has to be done.

An interesting question is, how much should the pro version have extra features that the basic consumer version does not, so that people and companies should be willing to pay more for the pro version. More often the case is however the opposite: How many features should we delete to make the basic version, so that people would be willing to pay higher amounts for the professional version? The problem with versioning from the producers' perspective is in fact the amount of features deleted from the cheaper product in exchange to the price change.

How pricing affects game design

Game design has also foregone some tremendous changes over the past decade. Video games are no longer played in sessions lasting for hours. Instead, a typical mobile game player plays games in shorter sessions, possibly not lasting more than 5 minutes. According to Juul (2009), "a casual revolution" of game industry is happening right now.

When paying for a game upfront, the price is usually a promise of the contents. Before buying the game, the players usually read reviews of the game, ask their friends for recommendations or watch gameplay videos from YouTube (Juul 2009). In case of freemium games, the players usually test them themselves. If a game is good, the players will keep playing. On the other hand, if the game is not good, players can more easily stop playing the game, since there basically no sunk costs invested.

The most important part for the freemium mobile games success is probably the in-game economy's connection to the real life economy (Evans 2015). The players can purchase in-game currency with real-life money. Usually there are two types of in-game currency: The one that can be earned by playing the game, and a premium currency that can be purchased with real money. With premium currency the players can, for example, purchase some valuable in-game items or advance in the game faster. Lehdonvirta (2008) calls this a virtual asset market. It is usually a monopoly market in mobile games, in which the game developer acts as the sole seller of premium currency. In contrast, many other type of games give the players possibilities to sell items or currency themselves. The games might support these

kind of transactions themselves, or the players may at use third-party platforms like eBay (Lehdonvirta & Castronova 2014).

Traditional economics can tell about the change in players' preferences in terms of price and quantity, but to gain deeper understanding of the subject, the game designers are now turning to behavioral economics. Game companies realize the importance of

Some help can be found from behavioral sciences and, for example, the impatience of players. In general, it can be said that the players either have a lot of free time or spare money, and they are perhaps willing to spend either one to the games (Lehdonvirta 2008). This is why many mobile games usually have an aspect of time: The players often have to wait periods of time to be able to do anything at all, or they can spend money to play the game. The players choose which one they value more, their time or their money.

Behavioral economics of mobile games

Behavioral Economics concentrate more on the irrational side of human behavior. According to a highly simplified definition, traditional economics focuses on what people would theoretically do if they were completely rational beings and acted out of their personal self-interest (Butler 2014). Instead, behavioral economics studies the actual behavior of people, and what kind of economic activities they do in real life, although it might not be rational in the traditional sense (Butler 2014). Behavioral economics is also used to find out actual reasons behind people's behavior.

The economic theory has been used before in game design process. The field of behavioral economics has been widely used before, when justifying design of content distribution in games (Hamari 2011).

For example, because of the sunk cost –fallacy, people are more willing to invest more effort in activities that they have invested before. In the context of games, people tend to play games the more they have played them before. People feel that they have invested so much time and effort in playing a game, so it would be a waste of time to let all that slide. It feels irrational, although it is not.

Game design should emphasize low switching costs for the new players, so that starting to play a new game would be effortless. Eventually, when the new player is hooked, game design should emphasize the concept of loss aversion by making the players feel that they loose something if they do not play the game often. For example, in Supercell's game Clash Royale, this has been taken into consideration with the treasure chest –feature. If the player does not enter the game perhaps multiple times per day the player will waste time and cards by not being able to unlock treasure chests. In Pokemon Go players are encouraged to return to the game by granting extra experience points if players play the game on a daily basis.

Eventually, when these game features hook people, some of them will start purchasing more content to the game. Although playing games can be seen as a fun activity, playing too much can be bad for your health. Since video games give you rewards for your progress, playing games can become an addiction. If the game has some social features, where the players somehow interact with each other, the network effect will take place. Players may, for instance, visit each others gamer profilers, gift each other virtual presents et cetera. Each user adds to the positive externalities, making the game a richer experience for each other, but also enhancing the possible game addictions.

Still, Butler (2014) thinks that behavioral economics should be a key interest for game designers. Before, designers intend was to make nice and fun game mechanics, but no one really understood what kind of incentives certain mechanics gave to the players. Nowadays, in the case of freemium games, the design process works in the opposite way. The designers have some wanted player response in mind, and they try to find a mechanic that supports that wanted response the best.

For example, when considering the concept of sunk costs (Arkes and Blumer 1985), the consumers tend to let past decisions affect them in future decision-making. In the context of mobile games, once the player has invested for example time, money or effort to the game, the player is more likely to keep playing the game further. To stop playing may seem irrational to the player. Therefore, designing a game mechanic that makes these sunk costs visible to the player or actually increase the past invest made can enhance the sunk cost -effect.

This tendency can be applied to a game mechanic in various ways. There are several known mechanics in games that are known acknowledge sunk costs (Butler 2014):

- Monetary investment (total cost of playing thus far, regardless of business model)
- Progression
- Achievements
- Collectables
- Status
- Social connections

Simply put, behavioral economics can find some deep knowledge about the games and human behavior. Since the usage of game mechanics is opposite to the old way of designing, even new game mechanics can be discovered, that no one came to think of beforehand. This works at least in theory. The realities of game market and implementation difficulties often restrict the full usage of behavioral economics (Butler 2014). Schell (2008) describes that game designers have nowadays two goals: On the other hand, they should design meaningful game experiences, and on the other hand, they should design the game in the most profitable way. Making these objects meet is often extremely difficult, and a theoretical framework to include both objects is yet to be found.

Player impatience

Contemporary casual mobile games usually emphasize the concept of dead time (Hjorth and Richardson 2011), which means the time players can't do anything productive in games. When the game is first started, the player will be granted enough time to learn the rules of the game and to gain some in-game valuables, like items or fictional currency. After a while, the game advances much slower. The players might not be able to do anything, or their efforts can be wasted and they don't get in-game awards or experience points for their playing. This kind of game mechanic encourages the player to play the game in shorter sessions, but plenty of times. Instead of one game session per day, there can be five.

According to Goldhaber (1997), the attention economy is a core theoretical framework concerning digital media products, including video games. He argues that rather than money, the real currency used in digital media products is time, meaning the attention of the user. Evans (2015) is developing this idea further concerning freemium mobile games: instead of using real money to purchase attention from the game, the players are using real money to minimize the time they are enforced to be away from the game. In other words, the players are using the money to avoid the dead time slots between game sessions. Suddenly, the opposite of players' attention becomes more important than the attention itself.

Evans (2015) argues that the impatience of the players is one of the key factors in monetization of mobile games. Using real money in games no longer functions only as a way of exchange or ownership, but it actually has effects of the game experience and the dynamics of the game. According to Evans (2015), using real money is not only about purchasing virtual assets, but purchasing enhanced experience within the game. The players may be able to control their game better and, most importantly, to control the time and attention they use to play the game.

The dead time between these gaming sessions is crucial for the freemium pricing strategy. As said, in many games the players have to wait in order to progress in the game, or to be able to play at all. Mobile games emphasize mechanics where players pay real money in order to get rid of dead time slots.

Social gaming can enhance the effect of avoiding dead time. If players are competing each other within the game, not being able to play the game gives an advantage to the other player. Using real money may be essential in keeping up with the competition, if not having the sufficient time to actually play the game.

Mobile games using freemium pricing strategy feature quite often a never-ending gameplay structure (Evans 2015), which means that players can never actually finish the game, and can it can be played forever. This kind of structure is also highly important for monetization of a game, since it can potentially enable eternal revenues.

Case Study: Supercell

Supercell is famous for their freemium games, since it has successfully monetized all four of its released games. If the whole revenues of the Finnish game industry were 2400 million euros in 2015, Supercell's share of this was 2100 (almost 90 %).

Supercell's newest game, Clash Royale, has proven to be as successful as its predecessors. Like the company's other games, Clash Royale is easy to learn, but hard to master. The whole game experience intensifies as the player progresses deeper to the game, and some of the players will eventually want to spend money on the game.

In the game, two players battle each other in real time using character cards to summon soldiers to the battlefield. Between games the player collects new cards and enhances the old ones in order to perform better in games. Cards are collected from treasure chests that are awarded after winning a game. The trick is that the player has to wait from 3 to 8 hours in order to open a chest. There are only 4 slots for treasure chests, so if the player has all the slots full, there won't be any awards from winning games before the dead time is over.

The player can purchase gems with real currency, and the gems can be used to avoid the dead time slots inside the game. The gems can be brought in several different quantities and prices, so that there will be different kind of options for the players that value the game differently. This is the quite usual way of doing price discrimination in modern mobile games, and Supercell is the master of balancing dead time.

Clash Royale also has several mechanics that utilize sunk costs, mainly the cards that the players get when playing and using money. Once the players purchase a rare card with real money, the sunk cost –effect intensifies even further, which makes quitting playing even harder.

Conclusions

Mobile game industry is doing extremely well in Finland, and this thesis is giving some answers to the fact why Freemium games are the reason behind this kind of development. Behavioral economics can definitely identify some ways of how a game design could be improved in order to be even more profitable. Evans (2015) argues that economics in general can enhance the game design process. Game designers often come from a programming or an artistic background, and might not fully understand the potential of freemium. It is essential to consider the facts how game design works in the context of economic behavior.

Some critics argue that behavioral economics are in fact just a collection of anomalies that apply to certain situations. Traditional microeconomics is still a powerful tool in analyzing why people play games and why they invest money in them

Furthermore, there are still unanswered questions where economics has not yet found an answer considering mobile games. Evans (2015) says that it's nearly impossible to forecast how long will a freemium game be successful.

People play games for fun, for a leisure activity. But the motivators behind every player's interest of playing games varies, and Bartle (1996) has divided people in four different, distinctive categories based on their behavior in multiplayer games: Killers, Achievers, Socializers and Explorers. The names suggest that people play games for different reasons, and since they should be motivated with different kinds of methods. This should also be considered in the design of freemium games.

The ethics of designing mobile games can also be considered. Butler (2014) sees that game developers are in fact trying to make games that will get players addicted. This could mean more profits for the company, but eventually, as awareness of the addictive nature of games rises, people will turn against the game companies.

Freemium economics is not the perfect pricing strategy for mobile games, since it affects the game design process so thoroughly, and the designers cannot fully concentrate on the amusing side of games. Still, the biggest revenues come from freemium games. For the time being, that is good for the overall gaming industry.

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