



Increasing Transparency For Consumers Showing Probabilities of Virtual Items In Loot Boxes In Digital Games

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Article History:

Received: 20-06-2020

Accepted: 29-07-2020

Publication: 09-10-2020

Cite this article as:

Christian Lohse, P. (2020).
Increasing Transparency for
Consumers Showing
Probabilities of Virtual Items in
Loot Boxes in Digital Games.
*International Journal of Social
Sciences and Economic Review*,
2(3), 23-28.
doi:10.36923/ijsser.v2i3.68

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Abstract: This study aims to investigate the public acceptance of potential loot box regulation in digital games, focusing on the similarities between loot boxes and gambling, and the need for increased transparency. An online survey was conducted in July 2019, targeting participants from Germany, Hungary, South Africa, Thailand, the United Kingdom, and the United States of America. The survey collected data on consumer preferences regarding the mandatory disclosure of loot box probabilities. The survey results indicate a strong public agreement on the need for mandatory transparency in displaying loot box probabilities. Participants believe that showing these probabilities would lead to a decrease in spending on loot boxes, suggesting that game publishing companies currently avoid this practice due to potential revenue loss. The study concludes that there is significant public support for increased transparency in loot box mechanics, with participants from all surveyed countries agreeing on the necessity of such regulations. The findings suggest that regulatory bodies should consider implementing laws to mandate the disclosure of loot box probabilities. Further research is needed to explore consumer preferences in other countries and to determine effective regulations for digital games with loot boxes. This study contributes to the limited knowledge in this field and highlights the importance of understanding consumer preferences in game design and regulation.

Keywords: Freemium, Digital Gaming, Survey, Transparency, Loot Box

1. Introduction

The subject of this paper is the statistical analysis of the transparency of loot boxes in mobile digital games in Germany, Hungary, South Africa, Thailand, the United Kingdom, and the United States of America. In recent years, digital games have faced frequent disputes concerning their impact and business models (Bauer, 2018; Au, 2019; Wetterau, 2018; Pitscheneder, 2018; D'Anastasio, 2019; Schmieder, 2019; Kleinman, 2019; Lohse, 2019). In this context, digital games are treated as fully digital goods based on Stelzer's definition. According to Stelzer, digital goods are immaterial ways to satisfy needs that can be developed, distributed, or applied through an information system. They are products or services that can be represented, transmitted, and processed in the form of binary data (Dirk, 2000).

The games industry, especially in the field of mobile gaming, has changed significantly in recent years. Paid offers are becoming less common with an increase in free mobile digital games (Spencer, 2016). According to Spencer, free games generate the highest revenue in respective online portals (App Store, Play Store, etc.) (Spencer, 2016). These games can be categorized as freemium games. "Freemium" is a term composed of the words "Free" and "Premium". In a freemium business model, companies provide a substantial portion of their offerings for free, with in-app purchases generating revenue for additional services. Thus, freemium is a combination of free and paid offers. A freemium revenue model is a form of price differentiation. Game publishing companies no longer try to sell as many copies of the games as possible. Instead, these games maximize user numbers and try to get the users to make in-app purchases, which give players an advantage within the game or enables them to make cosmetic changes (skins).

According to the global digital games analytics portal Newzoo, the global mobile gaming market is even larger than the global gaming market for PC or console games (stationary digital games) (Wijman, 2019). It is estimated that the global mobile gaming market will achieve a volume of \$68.5 billion. For example, according to Takahashi, the mobile games "Clash of Clans" and "Clash Royale" from publisher Supercell together generated \$2.3 billion in revenue in 2016 worldwide (Cowley, 2017).

In recent years, numerous newspaper articles have reported excessive in-app purchases by minors and adults within short periods of time (D'Anastasio, 2019; Kleinman, 2019). These purchases have sometimes resulted in very high costs, leading to increased criticism of in-app purchases. In 2019, the World Health Organization (WHO) officially classified video game disorder as a mental health condition (Rettner,

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2019). According to WHO, gaming disorder occurs when there is a "pattern of persistent or recurrent gaming behavior in which people lose control of their gaming behavior, give priority to gaming over other interests and activities, and continue gaming despite negative consequences, such as impairments in their family relationships, social lives, work duties or other areas" (Rettner, 2019).

Many people see a connection between loot boxes and gambling because of the element of chance. Regulations for loot boxes have been discussed by different institutions and in many different parliaments (Au, 2019; Wetterau, 2018). Some countries have already implemented regulations for loot boxes in their national law.

2. Literature Review

There is an ongoing public discussion about the excessive usage behavior of mobile digital games (Bauer, 2018; Au, 2019; Kleinman, 2019). This discussion is prevalent in many countries around the world. The central research question is whether it is necessary to increase the transparency of loot boxes in digital games for consumers and what motivates people to demand this increase in transparency (Abubakar & Obansa, 2020; Aguenane, 2020). This study examines the demand for increased consumer transparency of loot boxes in multiple countries, provides a descriptive overview of the issue, and discusses the results.

Games are no longer just products; they also include services. People use games over extended periods, and game publishers continually update their games. Oscar Clark discussed this phenomenon in his 2014 book "Games as a Service: How Free to Play Can Make Better Games" (Clark, 2014). Dimitar Draganov's 2014 book "Freemium Mobile Games - Design & Monetization" explores how game designs can keep people engaged with a game over time and convert players into paying customers (Draganov, 2014). Tim Fields' book "Mobile & Social Game Design - Monetization, Methods, and Mechanics" (2014) examines the effects of game design on converting players into customers and focuses on key performance indicators (Fields, 2014). According to Fields, a low ratio of daily active users to monthly active users indicates a problem in retaining players.

In 2015, Fowelin published an article on how and why game publishing companies use freemium as a monetization strategy (Fowelin, 2015). This research employed both qualitative and quantitative methods and positioned freemium as a competitive strategy or marketing tool.

Schwidessen's 2018 study on the classification of loot boxes delves into the element of chance in loot boxes and under what circumstances they can be classified as gambling under German law (Schwidessen, 2018). Krainbring and Röhl's 2018 study also addresses loot box classification, arguing that changes in law and jurisdiction regarding loot boxes are likely to occur in many countries soon (Röhl, 2018). Laustetter's 2012 study on the distinction between gambling and skill-based games discusses various methods to calculate the element of chance in a game (Laustetter, 2012).

3. Methodology

The research method of this study is empirical. In July 2019, an online survey was conducted on social media, promoted with ads on Facebook and Instagram. The survey targeted respondents in Germany, Hungary, South Africa, Thailand, the United Kingdom, and the United States of America. The data presented in this study are relevant for both mobile and stationary digital games. A total of 248 people from Germany, 302 from Hungary, 168 from South Africa, 238 from Thailand, 229 from the United Kingdom, and 127 from the United States participated in this survey.

The survey was divided into two groups: one for mobile gaming and one for stationary digital gaming. Participants were asked about their usage behavior regarding in-app or in-game purchases. The data presented in this study focus on the responses to the statements "I would appreciate that probabilities of items in loot boxes are shown" and "Showing loot box probabilities makes me spend less on in-app/in-game purchases."

The survey included both questions and statements. Participants were required to respond to the questions with "Yes," "No," or "Prefer not to say." For the statements, participants could respond with a rating from one to seven, where one stood for "Do not agree at all" and seven stood for "Completely agree." A pre-test was conducted in June 2019 with seven respondents, ensuring a balanced gender ratio: four men and three women participated in the pre-test.

There is a possible bias for people who do not use social media. Running ads inside games is often not feasible, leading to an unavoidable social media bias. Ads on social media were shown randomly to people interested in gaming, with targeting specific to each country or region.

4. Analysis

A possible regulation of loot boxes that has not yet been widely discussed is the mandatory implementation of showing probabilities of items inside loot boxes within digital games. This regulation could increase transparency for consumers. The survey participants were asked about their opinion on the statement, "I would appreciate that probabilities of items in loot boxes are shown." Figure 1 shows the survey responses to this statement.

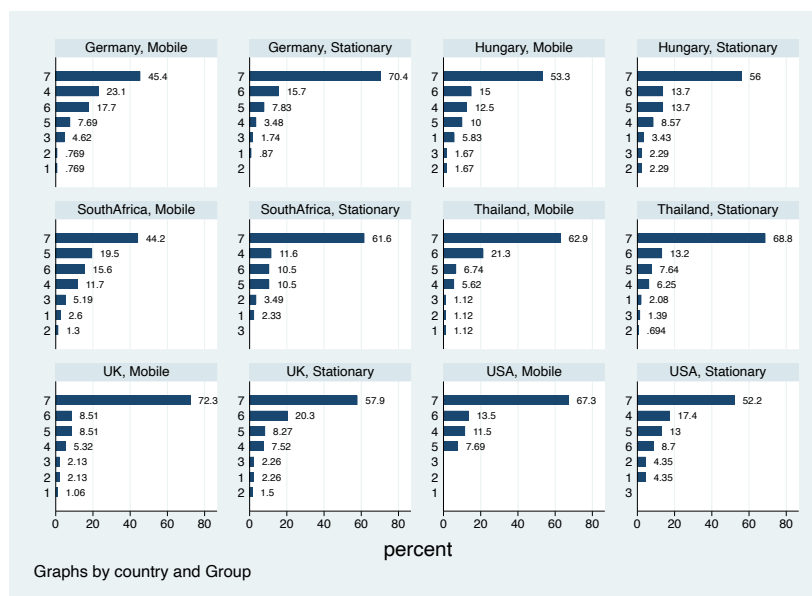


Figure 1: Survey responses in relative numbers to the statement “I would appreciate that probabilities of items in loot boxes are shown” (own figure).

The majority of participants in both groups across all countries agreed with the statement, indicating that they would appreciate the display of probabilities of items in loot boxes, though there were minor variations. To further investigate the determinants driving the motivation to increase consumer transparency, a regression analysis was conducted. The dependent variable equals one if the survey participants responded to the statement “I would appreciate that probabilities of items in loot boxes are shown” with a five or higher; otherwise, it equals zero. The independent variable “sex” equals one if the participant is male and zero if the participant is female. The variable “underage” is a dummy variable, equal to one if the survey participant is 17 years old or younger and zero otherwise. The independent dummy variable “Mobile” equals one if the survey participant plays mobile games and zero otherwise.

Other relevant statements for this regression analysis include “I would appreciate it if all virtual items in a loot box are available at least once in a while in the game shop for a fixed price,” “Showing loot box probabilities would make me spend less on in-app purchases,” “I would welcome age restrictions for games with loot boxes,” “I would appreciate showing my payment history in the game,” “I want to have a good ranking in the leaderboards,” “I’m proud of my game progress,” and “I like to play for several hours at a time.” A positive response (five, six, or seven) to a statement was coded as one, and zero otherwise. Based on these statements, the dummy variables “Lootboxcontentshop,” “ProbLBless,” “ProAgerestriction,” “Showingpaymenthistory,” “GoodRanking,” “ProudofProgress,” and “Severalhours” were generated. “Accsharepassive” equals one if other people play the participants’ game accounts too and zero if no one else plays their game account. “Accshareactive” is a dummy variable that equals one if the survey participant plays the game account of another player and zero if they do not. Table 1 shows the results of the linear regressions for the six countries in this study and the overall average. Linear regression was chosen because it results in higher values of R^2 compared to a Logit or Probit model.

Table 1: Regression results

	(1) All	(2) Germany	(3) Hungary	(4) South Africa	(5) Thailand	(6) UK	(7) USA
Sex	0.156*** (0.027)	0.183*** (0.052)	0.111** (0.050)		0.181*** (0.065)		0.293*** (0.070)
underage	0.041** (0.021)	0.130** (0.062)					0.202*** (0.063)
Lootboxconten~p	0.091*** (0.021)	0.102** (0.049)		0.141** (0.065)			
ProbLBless	0.137*** (0.020)	0.137*** (0.049)	0.210*** (0.045)	0.196*** (0.058)	0.074** (0.037)		0.107** (0.053)
ProAgerestriction	0.154*** (0.021)	0.177*** (0.050)	0.106** (0.045)	0.191*** (0.058)	0.202*** (0.038)	0.162*** (0.042)	0.194*** (0.059)
ShowingPaymen~y	0.113*** (0.021)	0.121** (0.051)	0.138*** (0.043)	0.113** (0.057)			
GoodRanking	0.043** (0.020)		0.122*** (0.043)				
Mobile		-0.156*** (0.053)					
ProudofProgress		-0.131** (0.065)			0.143** (0.063)		
Severalhours		-0.101* (0.056)			0.067* (0.039)		-0.148*** (0.053)

	(1) All	(2) Germany	(3) Hungary	(4) South Africa	(5) Thailand	(6) UK	(7) USA
Accshareactive						-0.244*** (0.068)	
Accsharepassive							0.217** (0.098)
_cons	0.383*** (0.032)	0.619*** (0.100)	0.412*** (0.060)	0.417*** (0.067)	0.397*** (0.089)	0.818*** (0.031)	0.466*** (0.093)
Obs.	1098	217	286	162	222	222	106
R-squared	0.210	0.327	0.203	0.227	0.208	0.116	0.308

Standard errors are in parenthesis

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Males from Germany, Hungary, Thailand, the USA, and the overall average are more likely than females to appreciate the display of the probabilities of items inside loot boxes. Underaged individuals from Germany, the USA, and the overall average are more likely to appreciate the display of the probabilities of items inside loot boxes. Survey participants from Germany, South Africa, and the overall average who agree that the content of loot boxes should be available in the respective game shop at least once in a while for a fixed price are more likely to have a positive attitude towards the display of the probabilities of items inside loot boxes. People from Germany, Hungary, South Africa, Thailand, the USA, and the overall average who agree with the statement that showing loot box probabilities would make them spend less on in-app purchases are more likely to appreciate the display of the probabilities of items in loot boxes. People from all regions who welcome age restrictions for games with loot boxes are more likely to appreciate the display of the probabilities of items in loot boxes. Germans, Hungarians, South Africans, and the overall average who welcome the display of a payment history are more likely to appreciate the display of the probabilities of items in loot boxes. Survey participants from Hungary and the overall average who agree with the statement about good ranking in game leaderboards are more likely to appreciate the display of the probabilities of items in loot boxes. The mobile gaming group from Germany is less likely to appreciate the display of the probabilities of items in loot boxes. The group has no statistical significance in other areas for this statement. People from Germany who are proud of their game progress are less likely to appreciate the display of the probabilities of items in loot boxes, while those from Thailand are more likely to appreciate it. Survey participants from Germany who like to play for several hours at a time are less likely to appreciate the display of the probabilities of items in loot boxes, while those from Thailand are more likely to appreciate it. British survey participants who also play the game account of another player are less likely to appreciate the display of the probabilities of items inside loot boxes. American gamers who let other people play their game accounts are more likely to appreciate the display of the probabilities of items inside loot boxes.

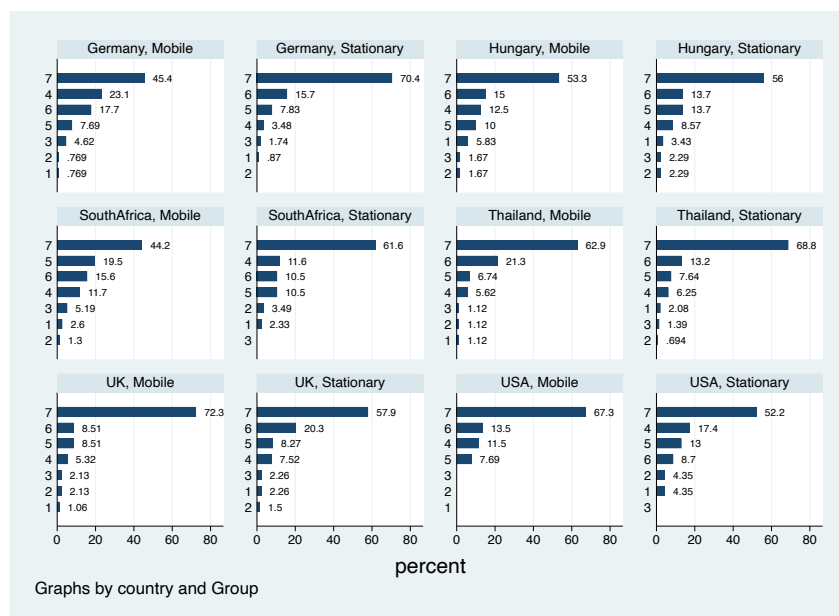


Figure 2: Survey responses in relative numbers to the statement “Showing loot box probabilities makes me spend less on In-App / In-Game purchases” (own figure)

Relevant statements for this regression analysis are “I would appreciate it if all virtual items in a loot box are available at least once in a while in the game shop for a fixed price,” “I would appreciate that probabilities of items in loot boxes are shown,” “I once felt like other players tried to push me to do an in-app/in-game purchase,” “I keep on playing, even though the game does not give me as much pleasure as it did in the beginning,” and “I lose interest in a game when I need a lot of time to learn it.” A positive response (five, six, or seven) to a statement was coded as one, and zero otherwise. Based on these statements, the dummy variables “Lootboxcontentshop,” “ShowingLBprob,” “Pushedbyplayer,” “Keepplaying,” and “Losinginterest” were generated. Table 2 shows the results of the linear regressions for the six countries in this study and the overall average. A linear regression was chosen because it results in higher values of R^2 compared to a Logit or Probit model.

Table 2: Regression results

	(1) All	(2) Germany	(3) Hungary	(4) South Africa	(5) Thailand	(6) UK	(7) USA
Lootboxcontent~p	0.070** (0.029)	0.166** (0.065)					
ShowingLBprob	0.320*** (0.038)	0.289*** (0.081)	0.444*** (0.070)	0.349*** (0.092)	0.298*** (0.107)	0.261*** (0.098)	0.313** (0.123)
Pushedbyplayer	0.081*** (0.030)	0.175** (0.078)		0.186** (0.074)			
Keepplaying	0.077*** (0.027)				0.180*** (0.064)	0.136** (0.065)	0.177** (0.086)
Losinginterest	0.070** (0.031)			0.173** (0.081)			
_cons	0.117*** (0.038)	0.057 (0.075)	0.127** (0.063)	0.197** (0.086)	0.163 (0.103)	0.270*** (0.101)	0.098 (0.118)
Obs.	1266	238	295	162	233	225	127
R-squared	0.090	0.123	0.119	0.155	0.074	0.046	0.087

Standard errors are in parenthesis

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Survey participants from Germany and the overall average who agree that the content of loot boxes should be available in the respective game shop at least once in a while for a fixed price are more likely to have a positive attitude towards the statement “Showing loot box probabilities makes me spend less on in-app/in-game purchases.” People from all areas who appreciate the display of the probabilities of items in loot boxes are more likely to spend less on in-app or in-game purchases when the probabilities of the loot boxes are shown. Germans, South Africans, and the overall average who once felt pressured by another player to make an in-app or in-game purchase are more likely to agree to spend less on in-app purchases when the probabilities of the loot boxes are shown. Survey participants from Thailand, the UK, the USA, and the overall average who keep playing even though the game does not give them as much pleasure as it did, in the beginning, are more likely to spend less on in-app purchases if the probabilities of the loot boxes are shown. Participants from South Africa and the overall average who lose interest in a game when they need a lot of time to learn it are more likely to spend less on in-app or in-game purchases when the probabilities of the loot boxes are shown.

5. Discussion

The survey participants demonstrated a significant demand for increased transparency in the display of probabilities for items inside loot boxes. The data presented in this study indicates a strong consensus that the probabilities of the items within loot boxes should be disclosed. Participants also expressed that showing these probabilities would lead to a decrease in spending on loot boxes.

This finding is critical as it highlights a clear consumer preference for transparency, which is currently not being met by game publishing companies. The reluctance of these companies to voluntarily disclose loot box probabilities can be understood in light of the potential financial impact. If consumers are more informed about the odds of receiving specific items, they may be less inclined to spend money on loot boxes, which could significantly affect the revenue generated from these microtransactions.

The high level of agreement among participants across different countries underscores a global concern that transcends cultural and economic boundaries. This universal call for transparency should prompt further discussions towards implementing regulations that require game companies to disclose loot box probabilities..

6. Conclusion

The lack of transparency is a significant issue for consumers. Showing the probabilities of items inside loot boxes is a way to increase transparency for consumers, but it is not mandatory by law in many countries. Making it mandatory for game publishing companies to display the probabilities of items inside loot boxes would likely enhance consumer satisfaction. However, game publishing companies are not inclined to show these probabilities as it could lead to a decrease in revenue (see Figure 2). There are no major differences between the preferences of players of mobile or stationary digital games. In-app purchases became popular in mobile digital games with the freemium monetization model. Today, in-game purchases have also become popular in stationary digital games.

7. Limitations and Future Recommendations

This study provides an overview of consumer preferences based on a survey. However, the consumer preferences of people from other countries remain unknown. The data presented applies only to Germany, Hungary, South Africa, Thailand, the UK, and the USA as of July 2019. Findings from this study cannot be generalized to other countries, as there may be regional differences. Future studies can address this research gap. Further research on consumer preferences for possible regulations can help identify useful regulations for digital games with loot boxes.

Acknowledgement Statement: The authors would like to thank all participants and the reviewers for providing comments in helping this manuscript to completion.

Conflicts of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding statements: This research has not received any funding.

Data availability statement: Data is available at request. Please contact the corresponding author for any additional information on data access or usage.

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