

Gaming as an Economic Ecosystem: Microtransactions, Artificial Scarcity, and Market Design

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Research Question: To what extent have microtransactions and virtual economies reshaped the business model of the gaming industry?

Abstract

This paper argues that microtransactions and virtual economies have significantly reshaped the business model of the gaming industry. While traditional games relied on one-time purchases or free access models, contemporary titles increasingly operate as ongoing digital marketplaces designed to encourage continuous player spending. Drawing on economic concepts such as price discrimination, consumer surplus extraction, and artificial scarcity, alongside behavioral economic principles including loss aversion and the sunk-cost fallacy, the paper demonstrates how monetization strategies are now embedded within game design itself. A case study of Dead by Daylight illustrates how dual-currency systems, limited-time cosmetics, and engineered scarcity create self-sustaining virtual markets that mirror real-world economic systems. The analysis concludes that modern gaming functions less as the sale of a finished product and more as an elaborate, revenue-optimizing economic ecosystem focused on maximizing long-term player expenditure.

Keywords: Microtransactions, Virtual Economies, Artificial Scarcity, Behavioral Economics, Games as a Service, Dead by Daylight

Introduction

If downloading a game costs nothing, why do players still end up spending hundreds of dollars on it?

The global video gaming industry has become one of the fastest-growing digital economies. Despite its humble beginnings as a limited form of entertainment in the late 20th century, it has evolved into a multi-billion-dollar global business that encompasses consoles, personal computers, and mobile devices. According to Newzoo's 2025 Global Games Market Report, the industry is expected to generate approximately \$188 billion in revenue (Buijsman, 2025). Over the years, the market has undergone a profound transformation thanks to technological advancements in the industry. The shift from physical cartridges and compact discs to digital downloads, online platforms, and cloud-based services has fundamentally transformed video games. As technology has advanced, it has allowed new ways for developers to connect with players and has continuously reshaped how people play and spend within games.

Consequently, even the economic aspect of the gaming market has undergone a significant transformation. For decades, developers relied on a single purchase model in which players paid up front to own a complete game. In recent years, however, the emergence of microtransactions, which are small in-game purchases that allow players to spend real money on virtual goods, upgrades, characters, outfits, cosmetics, etc., and the creation of virtual economies have altered this arrangement (Johnson, 2025). Developers have increasingly adopted the “Games as a Service” model, in which games operate as long-term digital platforms supported by continuous updates and in-game payments. This shift reflects something more than a technological change. It represents a new, intricate economic strategy centered on keeping players interested in the long term, clever pricing choices, and maximizing profit. Game design has evolved to encourage repeated spending through in-game currencies and reward systems for virtual goods, integrating concepts from economics and behavioral psychology to maintain player participation and profitability over time.

That said, this transformation, while profitable and innovative, has also generated debate. While the reliance on in-game monetization has created opportunities for growth and evolution, it has also attracted widespread criticism for blurring the boundary between gaming and gambling by encouraging repeated spending. These shifts also highlight how the gaming industry is a strong example of a digital market that can both replicate and reshape classic economic principles, such as supply and demand, as well as behavioral economics. Thus, this raises the question: **To what extent have microtransactions and virtual economies reshaped the business model of the gaming industry?**

The purpose of this paper is to argue that microtransactions and virtual economies have reshaped the business model of the gaming industry to a huge extent, as the gaming industry has evolved from a one-time purchase or even a free game into an elaborate business model that encourages players to keep spending more.

The Economics Behind Microtransactions

As noted earlier, microtransactions are small purchases in video games in which real money is exchanged for in-game items, such as outfits, character skins, or other assets. While many microtransactions themselves are small, they have reshaped the economics of the video game industry. While traditional video game revenue is based on single sales of a product, microtransactions enable more stable income, similar to the idea of Games as a Service (GaaS), in which video games are treated as a platform of content rather than as distinct products that people pay for only once. Instead of selling the game, developers under the GaaS model release ongoing content, such as seasonal events, new DLC (downloadable content) (Amanda, 2023), or new microtransactions, which drive players back to the game to play and spend money on new content. Mobile games, in particular, are the primary drivers of the games-as-a-service (GaaS) model (Bank, 2023), but this is just one example of how microtransactions have transformed the traditional fixed-price sales model into one that varies with actual player behavior (Buijsman, 2025).

In addition to this system, price discrimination is another important mechanism by which microtransactions have made the gaming industry more profitable. Price discrimination, in economics, is the practice of making different consumers pay different amounts of money for the same good or service (Twin, 2024). In video games, a similar idea is seen with the use of microtransactions. In these games, casual players are willing to and able to play the game for free, while the more avid players (also known as “whales”) are willing to pay for premium content (Close et al., 2021). For example, a cosmetic outfit might cost a few dollars, a battle pass \$10-\$20, and a character or character bundle that provides significant value to certain players willing to pay more might cost hundreds of

dollars. While developers may not explicitly assign different prices to different individuals, the tiered microtransaction model effectively segments consumers by willingness to pay, thereby functioning as a form of second-degree price discrimination that maximizes revenue extraction.

Microtransactions additionally allow companies to capture consumer surplus. Consumer surplus is defined as the difference between the maximum amount consumers would be willing to pay and the amount they actually pay (Ita, 2025). Prior to microtransactions, many games were sold at a fixed price point. In current games, systems such as loot boxes, battle passes, and cosmetic bundles extract these surpluses through separate purchases, with many offered at multiple price points. There are also variable pricing strategies that developers can use in which the price of items or game state is varied based on players' actual actions within a game to extract maximum surplus over time. This has changed the way in which value is generated and exchanged within games across the wider industry from a one-off transaction to a continuing, variable, and data-driven exchange.

Behavioral economics plays a critical role in this monetization model. Microtransaction systems exploit several cognitive biases and psychological tendencies that encourage spending. The clearest example of this is the endowment effect, which in gaming refers to when players feel more compelled to make a purchase for an item if they have earned or unlocked part of their progress on that item (Pilat and Krastev, 2024). This is believed to occur because players essentially trick themselves into thinking partial ownership is full ownership, even if they don't physically own the item. This is supported by games that allow players to progressively unlock in-game cosmetics or characters, to the point where the locked portion feels as if it were already possessed but is restricted from access. When the item is paid to complete it, it feels as though you simply completed restoring something already owned through purchase, rather than purchasing a new item. This is similar to the sunk cost fallacy, when people continue investing in a project they have started, despite the investment not appreciably increasing their enjoyment, outcomes, or probability of success, thereby justifying further spending (Pilat and Krastev, 2021). As part of this, players who have already spent time or money continue to buy to justify their prior expenditures. This is because time spent in games can equate to financial investments in the real world. Once a player invests sufficient time in a game, they may not want to lose that time or the items and cosmetics they've acquired.

Additionally, loss aversion is another factor that can prompt a player to spend money to avoid a loss when a limited-time offer expires or when content is about to expire. It refers to the tendency for people to perceive the pain of losing something as more severe than the pleasure of achieving it. In gaming, developers frequently design time-limited events, seasonal rewards, or expiring offers that frame non-purchase as a loss. Hence, players may spend money not because they value a limited-time item highly, but because they want to avoid the negative emotional response associated with losing access to it after the limited-time offer expires.

Furthermore, whales (players who pay a disproportionate amount for in-game benefits) are motivated to spend more than others because of being emotionally attached to the game, often desiring status, or enjoying collecting items. Even though whales represent a small proportion of the player base but generate a large share of total revenue, game developers frequently design monetization systems that cater specifically to their preferences and spending behavior.

Ultimately, microtransactions are generally viewed as a means to shift games from one-time purchases to ongoing revenue streams, and they involve an interplay among pricing strategy, behavioral economics, and customer engagement. They are not distinct systems, but a core element of a game's economy. We will now move on to

the next layer of monetization, in which these systems begin to resemble digital economies, with economic models of supply, demand, and scarcity.

In-game Economies and Virtual Markets

Microtransactions are centered on the exchange of goods and services, which directly mirrors the function of real-world markets. As such, many video games are built around in-game economies that themselves regulate how value is created and perceived. At the core of these systems are virtual goods, which are digital items such as in-game currencies, character skins, resources, abilities, or cosmetic enhancements (Fernando, 2022). These goods have no physical form and exist only in the game's digital environment. Even though they are intangible, virtual goods hold real value to players because they affect gameplay expertise and allow for expression (for example, a cosmetic/outfit). Often, game developers intentionally integrate these goods into their games and sometimes make them central to player interaction and monetization. Although virtual economies exist in digital spaces, they operate according to economic principles similar to those found in real markets, which makes them suitable for economic analysis.

A key reason virtual economies function effectively is that they follow the basic principles of supply and demand. Supply is defined as the willingness and ability to sell a good at a given price, whereas demand is defined as the willingness and ability (affordability) to buy a good (Tragakos, 2020). In these markets, the supply of virtual goods is entirely controlled by game developers who determine how items are produced, how frequently they appear, and how they are distributed to players. Demand, however, is generated by players based on their preferences, such as how useful they might find a game item. Items that enhance gameplay by inflating skill level or allow for customization tend to have higher demand as players perceive them as useful. Equilibrium occurs when the quantity of virtual goods supplied by developers equals player demand.

However, in gaming environments, equilibrium may intentionally not be achieved due to artificial scarcity (Xie, 2025). Scarcity is defined as the basic economic problem: goods are finite, whereas people's needs and wants are infinite (Tragakos, 2020). In the case of video games, artificial scarcity is key to assigning perceived value to virtual goods. Unlike real goods, which are limited by production costs, raw material, time period, etc., virtual goods can be created infinitely at almost no cost. Despite this, developers intentionally reduce the availability of in-game items and cosmetics to increase their perceived desirability among players. This is achieved through methods such as rarity tiers, limited-time or seasonal items, and exclusive unlock conditions. By controlling supply in this way, the developers create a sense of urgency and exclusivity among players, encouraging them to spend more money to obtain these items or to engage deeply with the game. This demonstrates that, in virtual economies, value is often socially and psychologically constructed: players perceive items as valuable because they are scarce or difficult to obtain, rather than because of any production or purchase costs, as in the real world. Artificial scarcity, therefore, increases monetization and engagement among players, which is the backbone of any virtual economy.

Beyond the game itself, secondary markets have recently emerged in which players can buy, sell, or trade virtual goods, often using real money and often illegally (Velasquez, Newman and Miller, 2012). These markets can be considered "black markets" and operate on the same supply-and-demand principles established within the game, but in this case, players control the market forces (supply, demand, quantity, price, etc.). Thus, the rarity of items/cosmetics, player demand, and artificial scarcity also influence prices in secondary markets. The existence of these markets raises important economic and ethical questions. For instance, who truly owns a digital item:

the player who purchased it or the developer who created it? Is it allowed to sell these items once someone has bought them? And how should these markets be regulated to prevent fraud and exploitation? The conversion of virtual goods into real money also shows how digital platforms can function as real markets on a smaller, more controlled scale, making it difficult to distinguish between virtual and real economies.

Upon observing artificial scarcity, supply, and secondary markets, it is clear that virtual economies are interesting systems that mirror many key aspects of real economics.

Case Study - Dead by Daylight

One notable example of a video game where many of these monetization tactics come into play is Dead by Daylight, an asymmetrical survival/horror game in which one player takes the role of a killer while four players take the roles of survivors. The objective of the survivors is to work together as a team to repair generators that can be found around the map, in order to power an exit gate to escape the map, while the killer’s goal is to prevent survivors from escaping by trying to find, chase down, and kill survivors.

Dead by Daylight’s monetization stems from the purchase of the various killer and survivor characters available in the game, as well as the many outfits that a player can buy for them. As such, the game is full of microtransactions. The figures below illustrate the virtual market for character outfits in the game, showing the prices at which each outfit is demanded by consumers (players), thereby creating the virtual market.

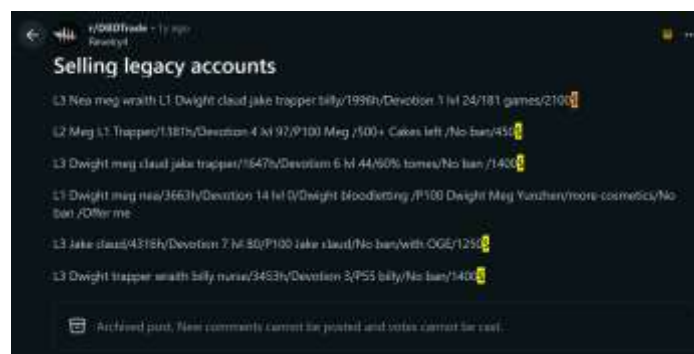


Some cognitive biases that Dead by Daylight regularly exploits to boost sales revenue from virtual goods (characters and cosmetics) include the endowment effect, the sunk-cost fallacy, and loss aversion. This is because the game has limited-time seasonal events and offers for each time of the year, for example, the game’s anniversary event in June, the Halloween event in October, and the winter event in December. During these periods, many exclusive, limited-time cosmetics and offers become available for a short period, typically 3 weeks. This encourages players to spend more, as missing out on these cosmetics means they will be unobtainable until next year, or sometimes forever. The figure below shows winter-exclusive cosmetics, each with a timer that directly indicates how much time remains to purchase them, prompting players to avoid loss aversion by buying these limited-time outfits immediately.



Dead by Daylight also employs the concept of artificial scarcity to a huge extent. To understand how, it is important to note how there are two methods of buying characters or outfits in Dead by Daylight: through an in-game currency named “Iridescent Shards,” which players can obtain by simply playing the game, and the second being another in-game currency named “Auric Cells,” which can only be obtained by paying real money. In each seasonal event, for example, the winter events, players receive a “daily login reward” everyday which can contain Iridescent Shards. Dead by Daylight intentionally creates artificial scarcity by limiting the amount of Iridescent Shards players receive from daily login rewards in events each year. One great example of this is how, during the game’s winter event, “Bone Chill,” 2,750 Iridescent Shards were offered from daily login rewards throughout the event in 2024, but these rewards were reduced significantly to only 1,000 Iridescent Shards in 2025. Thus, this artificial scarcity limits players' affordability for in-game characters and cosmetics using Iridescent Shards, prompting them to pay for Auric Cells in order to buy their desired outfits.

Another way Dead by Daylight creates artificial scarcity is by releasing cosmetics that are available only to a small subset of the player base. One key example of this is the “legacy” outfits, available to players who played the game when it first launched in 2016. Hence, due to the artificial scarcity of these legacy outfits, which were available only to players who played in 2016, secondary markets have emerged in the game, where players often sell their in-game accounts containing these rare legacy outfits for exorbitant amounts of real-world money. The figure below illustrates a secondary market in which a player sells Dead by Daylight game accounts that include rare, limited-legacy outfits, priced from \$450 to \$2,100, exploiting their artificial scarcity to justify these extreme prices.



Thus, it’s clear that Dead by Daylight exemplifies a virtual video game market characterized by microtransactions, artificial scarcity, cognitive biases, and illegal secondary markets in which supply and demand regulate consumer behavior.

Conclusion

The integration of microtransactions in games has enabled developers to implement Games as a Service models, thereby creating long-term cycles of repeated paid content and consistent player spending. Strategies such as variable pricing, consumer surplus extraction, and tiered offerings have enabled developers to maximize profits by shifting viewers' mindsets and catering to them in ways that encourage spending. By leveraging behavioral economics concepts such as the endowment effect, sunk-cost fallacy, and loss aversion, players are incentivized to spend more time and money in games than in traditional one-time purchase games or systems. It is also clear that in-game economies and virtual markets have emerged from video games, and that video games function as digital markets that employ supply and demand and the concept of artificial scarcity. However, as discussed, these markets operate differently: cosmetic items and events are subject to artificial scarcity, and player spending behavior has changed accordingly. Secondary markets exist for the sale of in-game goods, and they exhibit the real-world effect of these economies.

Overall, microtransactions and virtual economies have not merely supplemented the traditional gaming model but have fundamentally restructured it. The industry has transitioned from a finite, product-based transaction to an ongoing, service-based digital marketplace in which revenue depends on continuous engagement, behavioral incentives, and strategic price segmentation.

The case study of *Dead by Daylight* illustrates this transformation concretely. Its dual-currency system, limited-time cosmetics, artificial scarcity mechanisms, and reliance on behavioral biases demonstrate how game design itself has become inseparable from economic strategy. Revenue generation is no longer peripheral to gameplay; it is embedded within progression systems, event structures, and reward cycles. The emergence of secondary markets further reinforces the reality that virtual goods now carry real economic value and operate according to the principles of supply, demand, and scarcity characteristic of real-world markets.

Games, therefore, are no longer primarily sold as completed products but function as dynamic economic ecosystems engineered to optimize lifetime consumer value.

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