

UW20: NEW WORLD DISORDER

Understanding Real Money Trading in MMORPGs

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Augustus Urschel

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The world is full of astounding economic opportunity. The classic idiom of “time is money” no longer only applies to the physical world; it has invaded and prospered in the popularly growing leisure activities of online video gaming. In the world of massively multiplayer role playing games (MMORPGs) in particular, a process of buying and selling exchangeable virtual items has flourished as these games grow in popularity. Online video game players of virtually any MMORPG have the option of spending real world money to purchase online virtual items in a process called “real money trading” (RMT). The growing prevalence and popularity of RMTs is both fascinating and concerning for the future of MMORPGs, and my research paper seeks to understand and identify the reasons leading to why RMTs occur in online virtual realms.

The field of Virtual Economics is a young and primitive one, emerging in step with the growing popularity of large scale MMORPGs such as Ultima Online, EverQuest, and World of Warcraft. The first serious academic foray into the study of MMORPG economics was done by Indiana University’s Professor Edward Castronova in 2001. His watershed article, *Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier* made the astounding claim that the virtual world of EverQuest had a GNP per capita comparable to that of some real world developing countries. Because it is possible to sell virtual in-game items and currency for real world currency like the USD, Castronova could aggregate a player’s total in game wealth and give it a real world USD value. Ever since then, there has been a significant amount of academic interest in the growth of the RMT industry. While there exists currently a wealth of information on the macroeconomic theories of virtual economies and how RMTs affected them, there was no prevailing research as to why a player would be driven to purchase virtual items instead of earning them in the first place.

In order to add to the academic discussion of virtual economies as a whole, it was absolutely vital that I had a comprehensive knowledge of the subject before attempting anything. The relative

youth of virtual economics as a research field made compiling a library of relevant sources fairly difficult at first. Frankly speaking, there are no books in the campus libraries that were relevant to the subject—because they have yet to be written. My primary tools for locating academic sources that were relevant to the topic of RMTs were exclusively online. I went on a massive database search through the Gelman library systems, supplemented my findings with frequent use of the new Google Scholar, and followed article footnotes and citations to expand my network of sources. The majority of the articles I ended up using were from the Social Science Research Network, which hosts an impressive collection of material dealing with virtual economics and RMT.

Thanks to the wonders of PDF files, I slowly build my own personal library of sources and articles that I could recall at will. My initial round of research was mostly built around the two underlying questions of understanding RMTs; how do virtual items themselves generate wealth, and how do virtual economies work when faced with an outside intervention? Nearly all of my research articles were primary sources, or sources that were primary but borrowed extensively from Castronova's findings. It became abundantly apparent that most research on the topic of RMTs was based off of one of Castronova's papers. For instance; each author had their own way of explaining how virtual items generate wealth in the first place, but each explanation essentially rested on Castronova's "common sense" approach to explaining why it happens. While was nothing necessarily wrong with that approach, I felt that I needed something a little more economically scientific to prove the point. I eventually decided that Karl Marx's definitions of "use value" and "exchange value" were excellent to explaining the phenomenon. I incorporated Marx's theory as a method source to prove that virtual items have real world value, and from there I could move on to explaining how that wealth is traded.

With the fundamentals established, my second round of research focused more primarily on the controversy of RMTs in MMORPGs. I managed to cobble together enough sources explain player and

developer reactions to RMTs. There emerged two major camps on the subject of RMTs; those that viewed it as a natural extension of a player's economic rights, and those that saw RMTs as cheating and undermining the spirit of the game. Without trying to take a side on the issue, I used these new articles to understand and develop a model to explain why players turn to RMTs in the first place. By modifying mathematical equations of two authors, I pieced together an entirely new model for "calculating" probabilities of RMT activity. Because the study of RMTs is a social science, I use the term "calculating" with hesitation because human behavior is incredibly difficult to quantify. Nonetheless, after vetting my model against probably RMT situations, it appeared to pass all the current tests to being a viable economic theory. Of course, this model is not revolutionary in its scope, but it does clearly define a process that had previously been left ambiguous. While heavily based upon the academic research of previous authors, my theory takes the discussion of RMTs to a new level by identifying the source from which they stem.

While this was not my first academic research project, it has been the most demanding and fulfilling one to date. There is something inherently gratifying about being able to construct an intelligent argument out of existing material and weigh it against other academic articles. It is my first rhetorical paper that not only argues a point, but also introduces a model for further academic use. Whether or not this paper serves as any practical use to anyone else besides me remains to be seen, it was nonetheless a great personal success as a writer.

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Introduction

In late 2006, the MMORPG community witnessed one of the most massive scams in online gaming history. The crime scene was *EVE Online*, a massively multiplayer online role playing game (MMORPG) where users fly a myriad of spaceships around a fictional universe. One of the game's main selling points is its open-endedness; while there are quests and preprogramed adventures, the overall objective of the game is entirely up to its players. Pilots can form organizations, participate in the player-run economy, build empires, and war with each other.

One gamer playing as the avatar "Cally" went so far as to form a fully functioning financial institution, which he called Eve Investment Bank. The bank grew immensely in popularity until one year after the bank's opening, when Cally grew tired of running the institution. Because he had unlimited access to the entire system, he cleaned out the bank's coffers and all of his client's invested assets. The white collar bandit made off with 700 billion ISK (the currency of EVE Online) which, using the game's ISK-to-gametime trading system (which allows you to use ISK to buy \$15 worth of gametime), could be converted to about USD 100,000.¹ It was the single biggest online scam in the history of MMORPGs.

What did this mean for the online world as a whole? For some, it was an interesting in-game curiosity—and nothing more. To the players involved however, this was an episode of the real world massively intervening in their online game. Suddenly, a sizable chunk of players' virtual wealth was stolen and converted to world dollars for a personal profit. While the concept of trading online items for real world money is a well-known occurrence in the virtual world, this scam was on a scale that dwarfed its predecessors. Not only did the thief pocket one hundred grand of real money over an online video game, but he faced no real world or in-game, legal repercussions because of it. Perhaps most importantly, this anecdote showed the world that trading virtual goods and currencies with real world

¹ Tudor Stefanescu, "Eve Online Economy Suffers 700 Billion Isk Scam," *Softpedia* (2006).
<http://news.softpedia.com/news/Eve-Online-Economy-Suffers-700-billion-ISK-Scam-33737.shtml>.

ones is a serious economic force. While the macroeconomic structure of EVE online remained unchanged by this event, it adversely affected a large number of players who associated with the game, and some pointed fingers at the ability to cash out game currency for real money as a prime motive for the crime. This ability to exchange virtual goods for real dollars (or vice-versa) is a somewhat controversial process known as real money trading (RMT).

Even consensual real money transfers are a powerful force in modern popular MMORPGs, yet the nature of their existence is often misunderstood. While many developers take a hardline stance against RMTs—as they can potentially threaten a game’s profitability—these same developers fail to fix or even understand the reasons why RMTs occur in the first place. Contrary to popular perception, the sale of virtual wealth is not necessarily a means of “cheating” the game system to gain an edge over opponents, but is instead an economic response to shoddy game design. Not only is it possible to understand and model exactly why most RMTs occur in the first place, it is also possible reduce or even effectively eliminate RMT through better game design.

RMT in MMORPGs Today

In order to understand how RMTs can be modeled, we must look at the basic mechanics for how they operate in a virtual world. These virtual worlds are MMORPGs: online games that exist within a persistent online world. Game developers provide a central server database which their users can simultaneously access to play the game with one another. The important difference between MMORPGs and other online games is the fact that they continue to run even after an individual player disconnects. Millions of players from across the world enter these virtual worlds via their in game avatar—virtual characters which players directly manipulate to act as a medium in the online realm. Most MMORPGs today exist in fictional universes or alternate realities, allowing their players to develop characters with superhuman or fantastical abilities, which are then pitted against the antagonists of the online world.

The prevailing theme of MMORPGs is the “rags-to-riches” experience, where players start out as lowly, powerless nobodies and climb their way to power, wealth, and fame through the game’s quests, stories, and challenges.² Players on this quest to glory will inevitably acquire virtual wealth during their online journeys. Completing game quests, destroying opponents, or crafting items from in-game resources all reward the avatar with virtual items and currency that can be used to enhance the character and make it more powerful. While most of these items can be sold to back to the game’s preprogrammed vendors for an in-game currency which can in turn be used to buy more useful items, this linear trade model is basic and completely overshadowed by the ability to trade items and currency with other players. Player to player economic interactions are the cornerstones of most virtual economies, and transactions can either take place through direct trade (bartering and currency exchange) or via server spanning in-game economic marketplaces that act as virtual retailers to shopping avatars. MMORPG systems operate like traditional capitalist economies: a typical player can forage in the woods, grind³ a plethora of boars, skin their hides and craft them into leather workings, sell them through the marketplace for currency, and use that currency to purchase a new virtual weapon. This type of economic activity is considered to take place in a “structured economy,” which is the economic bubble of the virtual game world. Players live, build, and buy virtual items with virtual assets while completely immersed within a fictional in-game world.⁴

RMTs are direct violations of this model. A RMT is the act of trading real world money for in-game virtual items or currency, or vice versa. From the perspective of a virtual citizen, RMTs are “foreign

² Edward Castronova, “On Virtual Economies,” *SSRN eLibrary* (2002).

³ Grinding is an important MMORPG concept that will be used throughout this paper. It is the act of efficiently and repetitively playing an MMORPG to produce the most virtual goods possible. This is accomplished by repeating a closed set of tasks such as slaying boars for hours on end, and it can blur the line between playing a game and working a game. In this instance, the player grinding boars (by slaying them en-masse) is farming, or maximizing, the amount of leather he can obtain during a given time period.

⁴ Castronova.

trade” with the outside world.⁵ Otherwise known as the “spillover” effect from the real world, a RMT is when real wealth and currency bleeds over into virtual world and affects its distribution of wealth.⁶ While some MMORPG’s are “unstructured economies”—which are designed to facilitate RMTs directly within the game economy—the majority of RMTs occur as black market transactions between individual players or third party vendors.⁷ The practice of buying in-game currency and items has become so prevalent that many MMORPG develops have taken drastic action against it because most MMORPGs operate on a subscription model. Developers feel that RMTs can potentially enable players to bypass content and cut into subscription profits, so players must agree to the End User License Agreement (or EULA) which are virtual contracts that waives a player’s rights to claim ownership over their virtually generated property. This means that all RMTs conducted within structured MMORPGs (notably World of Warcraft, Everquest I and II, Ultima Online, Lord of the Rings Online, and others) are technically illegal. Games developers’ technical ownership of the player’s virtual properties allows them to ban people attempting to conduct RMTs in game.

Real money transfers have multiple controversial facets that fuel a raging industry-wide debate. Many players and publishers see the purchase of virtual goods as a form of cheating.⁸ Because a wealthy player can simply buy into a game and forgo the trials of acquiring virtual wealth through traditional means, other players who have climbed their way to the top feel alienated by people who bought their way there. Castronova argues that “RMT is like a pollution of a service that the designers are attempting to provide to their customers,”⁹ and Lehdonvirta observes that “Real-money” buyers are also seen as

⁵ Ibid.

⁶ Arseni Starodoumov, “Real Money Trade Model in Virtual Economies,” *SSRN eLibrary* (2005).

⁷ Brian Mennecke and others, “It’s Just a Game, or Is It? Real Money, Real Income, and Real Taxes in Virtual Worlds,” *Communications of AIS, Vol. 19, July 2007* (2007).

⁸ Vili Lehdonvirta, “Real-Money Trade of Virtual Assets: Ten Different User Perceptions,” *SSRN eLibrary* (2005).

⁹ Edward Castronova, “A Cost-Benefit Analysis of Real-Money Trade in the Products of Synthetic Economies,” *Info* 8, no. 6 (2006).

violating the “achievement hierarchy” of a MMORPG.”¹⁰ While this argument is not necessarily true in all cases, RMTs do disturb immersion into a fantasy setting. Many players complain that interactions with gold farmers, sellers, and buyers disrupt the “magic circle” that separates the game from the real world.¹¹ Developers of games with structured economies try and squash illegal RMTs because they have the potential to cut into developer profit; RMTs can catapult players away from time-consuming and profit-making grinding elements of the game. While there is no direct cause and effect and no direct evidence, a RMT can potentially mean that the player will spend less time playing the game in the long run.

While developers and many players see RMT as a spreading plague that threatens the quality of their games, there are others who see it as a natural expansion of online play. MMORPG players spend a great deal of time working on their virtual characters. In many cases, the effort it takes to reach a high character level or acquire a rare in-game item is comparable to the effort put into a real life project. Many players feel that the fruits of their labor, virtual characters and items, are theirs to sell by right of the work they put into them. Many take up the banner of the Lockean theory of labor, and Lehdonvirta reports that one player in a case study asserted; “we have invested considerable labor (i.e. playing time) into obtaining our assets; therefore we are entitled to exercise ownership over them.”¹² Yet player-signed EULAs stipulate that this is not the case, and many courts in South Korea (where the RMT business is continually subjected to judicial review) usually rule on the side of game developers against third party RMT market vendors.¹³ One court stipulated that, because all virtual items produced in an MMORPG were designed and blueprinted by the developers, “In-game items... cannot claim the status of a good or property, and are simple functions within an intellectual property known as a game

¹⁰ Lehdonvirta.

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

program."¹⁴ While it is true that virtual items were originally designed by a game's developers, they nonetheless require a good deal of artificial "work" to produce them.

So who truly "owns" virtual property? The answer is currently lost in a legal debate that has no clear end. Yet regardless of whether virtual items are owned by developers or players, the fact remains that the transfer of those items is a growing force in today's MMORPGs. While there are multiple answers to who ultimately owns virtual items depending on the source, one underlying understanding between both parties is that virtual items do in fact require work and effort—and therefore command real world economic value.

Virtual Items Have Real World Value

One of the greatest shocks to non-MMORPG players is when they learn that people will pay real world money for digital in-game items that technically do not physically exist. Not every MMORPG player conducts such transactions, but out of the estimated 8 million MMORPG players in 2005,¹⁵ there were roughly 880 million USD worth of RMT transactions conducted.¹⁶ Lucrative third party markets for digital items (such as IGE.com) have risen in both profit and popularity as RMT has become more habitual, and some individuals have even made digital item "farming" their primary source of real world income. Some companies have even gone so far as to set up real world sweat shops. Some facilities in China and Mexico have hired hundreds of workers to farm and sell in-game items to wealthy MMORPG players.¹⁷ These virtual items—which are technically owned, destroyed, and replicated at game company's whim—can command incredible real world values when viewed in aggregate.¹⁸ How can

¹⁴ Ung-gi Yoon, "Real Money Trading in Mmorpg Items from a Legal and Policy Perspective," *SSRN eLibrary* (2004).

¹⁵ Lehdonvirta.

¹⁶ Starodoumov.

¹⁷ Sara M. Grimes, "Online Multiplayer Games: A Virtual Space for Intellectual Property Debates?," *New Media & Society* 8, no. 6 (2006).

¹⁸ Yoon.

virtual goods, whose quantity and quality are seemingly arbitrarily defined, be sold for hard earned cash?

If we take a step back from MMORPGs, we can ask a similar question about real world goods: how do we assign anything value? The German Philosopher Karl Marx developed a model that theorized innately useful goods such as food, clothing or tools, have value due to their innate usefulness. Items such as food or tools (or virtual items such as potions or armor) can be directly used by an individual to achieve some personal goal. In a world without trade, people will devote all of their resources to producing the most useful goods to survive. When a person is allowed to trade with others however, a new variable called exchange value is introduced into the calculation of a good's value. Exchange value is what our goods are worth to other people on the open market, but it doesn't necessarily equal their relative usefulness.¹⁹ For instance; a sack of potatoes may have its use value and exchange value roughly equal, but a diamond (or a virtual item such as a rare "pet") which has no practical uses has a very high exchange value (because they are status symbols) compared to its low use value. Even though currency such as the U.S. dollar has limited practical uses (you can burn it for warmth or use it as tissue); currency has a well-known *exchange* value that can be used to purchase goods that do have a high use value, such as food or tools.

Edward Castronova is an economist credited with pioneering the first serious research into virtual game economies.²⁰ In his publication *On Virtual Economies*, he reasons that money operates solely on faith. "In economics, the value of objects does not depend on their characteristics or their components, but rather on their contribution to the well-being of the people who use them. Value is subjective, wholly created in the minds of people."²¹ Again, because the majority of our society believes

¹⁹ Karl Marx, "Capital: Criticism of the Political Economy," (1867).
<http://www.marxists.org/archive/marx/works/1867-c1/ch01.htm#S1>.

²⁰ Edward Castronova, "Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier," *SSRN eLibrary* (2001).

²¹ Castronova.

that the dollar has value, it does. Financial meltdowns occur when people begin to lose faith that the dollar can be used to purchase goods or services, and a widespread belief that a currency is useless makes it so.

Castronova argues that the same is true for virtual currency. Current MMORPGs have large populations of players who spend a great deal of time living, playing, consuming, and producing in a shared virtual world. These virtual avatars produce virtual wealth in their gameplay experience, which can be traded for virtual goods to enhance the player's in-game wellbeing. Even games in fanciful or science fiction settings "faithfully reproduce the Western capitalist system" such that virtual currencies are exchanged exactly like their real world counterparts.²² It follows that, because virtual goods are useful to players, they have a real use value.

While these items could technically be mass produced at the game developer's command, online game structures mostly prevent items from being created arbitrarily. Items have an artificial scarcity built into their online properties. Even though items could theoretically be made free, players believe that these virtual items have a cost of production. Even though the effort to produce virtual goods is artificial (virtual bread could be instantly created out of nothing, a feat that has only been exhibited once in the real world²³), players nonetheless believe that it takes work to produce them. Castronova suggest that; "If everyone believes in some conspiracy theory, it is possible for society to make it true, for all intents and purposes."²⁴ In other words, because everyone believes the game mechanics which dictate that virtual items have scarcity and a cost of production, they do.

Just as the U.S. government tightly regulates the printing of money, game developers carefully regulate the scarcity of in game items and currency. In a sense, game developers act as de facto governments over their centrally planned economies. Because a volatile economy where a player's

²² Grimes.

²³ Matthew 14:13-21, Mark 6:34-44, Luke 9:10-17, John 6:1-13*

*Not a peer reviewed, academic source.

²⁴ Castronova.

assets could be made irrelevant or worthless would discourage people from participating in the game, MMORPGs economies follow predictable real world economic principles. Currencies, both real and virtual, are therefore nearly identical because they have a high exchange value despite having no use value.

An important discrepancy between real and virtual markets is that majority of virtual items in an MMORPG are technically commodities. Marx states that “A commodity is, in the first place, an object outside us, a thing that by its properties satisfies human wants of some sort or another.”²⁵ Commodities are goods which have no qualitative difference. Unlike their real world counterparts, every tradable item in an MMORPG is technically a commodity. This is because the various goods produced by players are all coded blueprints of the game’s source code. This means that every individual item that exists within an MMORPG is identical to other manifestations of the same parent blueprint. For example, every “Axe of Eternal Suffering” or “Lesser Healing Potion” has the same exact characteristics regardless of who produced it.²⁶ Unlike most real world items which vary depending on producer, if we compared every “Lesser Healing Potion” in World of Warcraft, they would be perfectly identical. This makes the sale of virtual items much easier; every item in game has a well-known use value regardless of the items producer. By combining an item’s costs of production²⁷ and the relative use value, players can identify how much an item is worth to them. If an item’s value is above its cost of production, a player will either produce it himself or attempt to trade for it in-game. Virtual items have a use value despite their

²⁵ Marx.

²⁶ Some MMORPGs, such as Second Life, allow user to create their own, unique, in-game content and sell it to other players. These transactions still follow the same principles of commodity RMTs, but due to their extreme rarity in online games the and for the purposes of this paper, exchanges of unique player created items will be excluded from this section. It should also be noted that selling characters is still considered commodity trading. While characters come in a wider range of varieties, most character creations system allow for limited, predefined variation between class characters of different users.

²⁷ This refers either to the game-time labor it takes to produce an item, or its “drop” rarity. Rarity in MMORPGs means the percentage chance an item will drop (or appear) after completing an in game task such as killing a monster or finishing a dungeon. Most rare drop items can only be obtained through this random chance, so the prevalence of the item in the game world is directly related to its drop chance and how often the monster or event is killed/completed by the player. Object with lower drop rates are rarer on the in-game market, so their cost of production (the average amount of time spent farming the item) is directly linked with their drop percentage.

apparent non-existence. This not only means that they command real economic value, but it also means that players will make rational spending choices where virtual assets can be just as valuable as real ones.

Real Money Trading as an Alternative to Grinding

Every time we make a choice, we rationally choose the option with the lowest perceived opportunity cost to us. An opportunity cost is anything we give up for making a choice; whether it's a hard factor like money or a soft factor like time or enjoyment. For example; the opportunity cost for buying a soda is that you cannot spend the money on a bagel, while the opportunity cost of reading this article is that you are not spending this time doing laundry (or any other number of activities). Understanding opportunity costs in gaming is the key to understand and predicting RMT. In a functioning MMORPG economy, players will attempt to maximize their efficiency while playing the game.²⁸ While the majority of a player's decisions to maximize efficiency occur within the game's parameters, players will sometimes reason that the best way to efficiently progress online lies outside the game's code. The best way to predict whether or not RMTs will occur is to understand what a player produces while playing online and what factors will cause a user to consider the opportunity cost activity over actually playing the MMORPG.

The first and most basic thing a user produces by playing is enjoyment. Castronova proposes that it is theoretically possible to measure the satisfaction or enjoyment of playing a game in his "Puzzle of Puzzles" theory.²⁹ He gives the example of a jigsaw puzzle: a ten piece puzzle would be far too simplistic to be satisfying, while a 10,000 piece puzzle would be far too challenging to be considered fun. He reasons that every player has an optimal challenge level somewhere in between these two extremes,

²⁸ Efficiency in this context can apply to anything the player values. For instance, one player may value socialization and moneymaking over experience game, another might play purely for roleplaying elements and player verses player combat. Regardless of what players' value in what combination, each will try to maximize combination to get the most out of their playing experience.

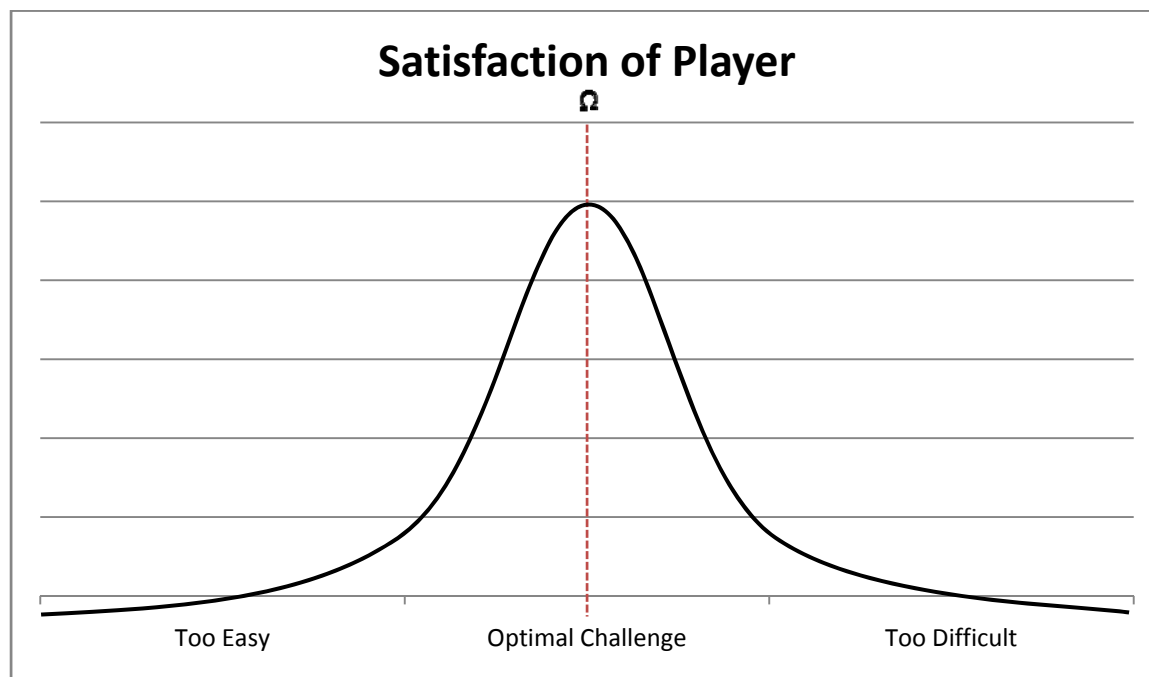
²⁹ Ibid.

and the satisfaction of any particular game puzzle can be measured with this equation developed by Edward Castronova:³⁰

$$S = \alpha R - \beta (C - \Omega)^2$$

Satisfaction (S) is equal to the Reward (R) of a puzzle minus the square of the challenge level (C) minus the players optimal challenge level (Ω), where α and β are coefficients.

Reproduced below is Arseni Starodoumov's visual representation of Castronova's equation, where the red line is the players optimal challenge level and the Y-axis is satisfaction.³¹



This model graph is fairly uncontroversial if broken down. The satisfaction any player gets out of a game, rewards being constant, is directly related to the relative challenge of the game puzzle. Players will be bored with easy puzzles and frustrated with difficult ones—even if they do manage to complete them. This is true in both simple games like jigsaw puzzles and more complicated virtual ones like MMORPGs. MMORPGs contain many puzzles within the game itself, so solving an in-game puzzle such

³⁰ Ibid.

³¹ Starodoumov.

as completing a quest, acquiring a rare item, or leveling a character follows the model above. With the exclusion of social interactions, MMORPGs are built around a series of both developer created (quests) and player created (personal achievement) puzzles. So long as players are met with an appropriate level of challenge and the rewards of playing stay constant, their overall satisfaction with the game will discourage them from bypassing the game's content and mechanics.

In addition to the primary product of satisfaction, players of MMORPGs also produce virtual assets as we have shown before. In some cases, the need for virtual assets overpowers that of satisfaction. Let us say that George Washington plays *Pirates of the Burning Sea* (POTBS), a ship-to-ship warfare game set in the Caribbean during the 1720s. For the majority of the game, George enjoyed the challenges presented by the game and played through until his character reached the max level. At this point, George is faced with a dilemma. In order to continue being a competitive player, George must buy a first-rate warship, which costs more doubloons (the in game currency) than George currently has. If he doesn't obtain this ship, the game will be too challenging for him, and eventually George won't be having much fun in his old rickety ship. His options are to obtain more doubloons (a grinding process which can be tedious) or to quit the game. If George believes that the reward for completing the task (getting back to the fun parts of the game) is big enough, he'll continue playing despite the temporary boredom.

Normally, a game that reaches a point where it is no longer fun is simply dropped if the reward is too small. But a third and powerful element is being produced while George plays POTBS: his social capital. Not only is George invested in the game emotionally, he has developed a cadre of online friends and achieved a unique virtual identity. Because George knows the game will be fun again later on, and his social connections attract him to stay, his reward for getting the new ship (R) and continuing playing is quite high even though the immediate process of grinding doubloons is thoroughly unsatisfying.

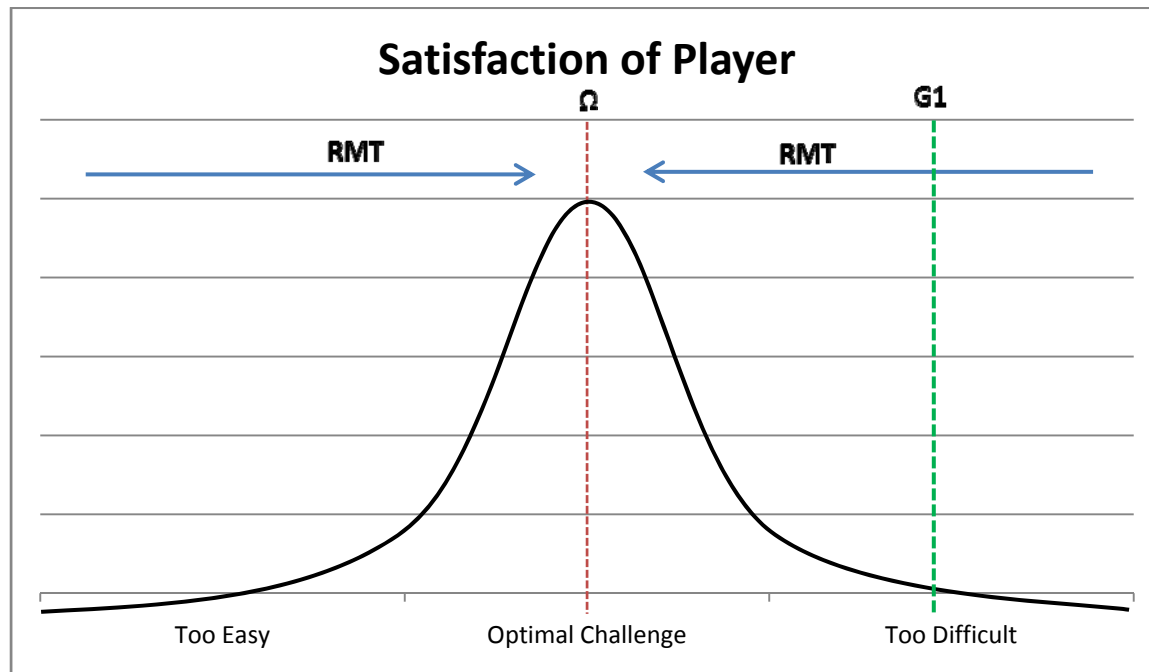
There is where RMTs enter the equation of online worlds. Let us suppose that, to earn enough doubloons to buy the ship, George would have to farm money for 30 hours. The high reward of getting the ship and playing with his friends means he won't quit the game outright. While the task of farming is not inherently difficult, the challenge of putting such a large amount of time into a boring task puts George well into the "Too Difficult" side of the bell curve to be satisfying. However, grinding is not George's only option. Multiple third party online relators offer to sell George the in-game money he needs for around USD 90. Should he do it?

George has a fairly high paying job at a marketing firm which pays him about USD 30 an hour. A simple calculation will show that George could either spend three hours at his job, or thirty hours playing the game, to achieve the same material goal of the in-game ship. Classical utilitarian economics would suggest that George optimizes his time by working his real job and buying the necessary virtual cash online, but this sort of thinking disregards the fact that POTBS is a game which George plays for leisure. For every hour that George plays the game (assuming he plays efficiently) he produces about USD 3 of virtual wealth (P), enjoys a variable amount of personal satisfaction (S), and spends time with other players in the game building his social capital (SC). While the production and satisfaction of any particular puzzle can be estimated (RMT conversions and Castronova's satisfaction equation respectively), there is no single model for measuring social capital. This is largely in part because the term "social capital" has no single definition, but for the case of MMORPGs, we will consider social capital to be the aggregate network of relationships a person has developed within a game.³²

I propose that George's total value of playing (TV_p) is therefore: $TV_p = P + S + SC$. If George decides that the net benefit of playing for 30 hours is greater than spending 3 hours at work to achieve the same goal, he will play the game. Despite the relative boredom of in-game grinding, he will still find it is more preferable than his opportunity cost of office work. If however, he decides that grinding for 30

³² Alejandro Portes, "Social Capital: Its Origins and Applications in Modern Sociology," *Annual Review of Sociology* 24, no. (1998).

hours is *less* preferable than working at his job for 3, he will buy the virtual money outright and buy his new ship, putting him back in the fun of the game. If we superimpose this onto Castronova's model of player satisfaction, we achieve Arseni Starodoumov's model that shows that RMTs bring difficult and unsatisfying puzzles back to a player's desired equilibrium of challenge ($G1$ to Ω).³³ With a quick cash transfer, George has his brand new ship and is back playing the most enjoyable parts of the game with his friends.



Building a Better Model: Predicting RMTs

By incorporating the equation of the total value of playing ($TVp = P + S + SC$) and weighing it against a player's highest opportunity cost, I reason we can consistently predict when a player will decide to conduct a RMT transaction rather than play through the game through the equation:

$$\text{If } \left(\frac{\alpha}{P}\right) * (S + SC) < \left(\frac{\alpha}{P}\right) * OP$$

Then RMT = True

³³ Starodoumov.

Essentially, if the amount of time needed to achieve an in game goal (where α is the goal measured in USD and P is the estimated USD production rate per hour) multiplied by the satisfaction of playing (S) and socializing (SC) is valued less than spending the same amount of time doing something else (opportunity cost, OP), than a player will conduct a RMT and chose to pursue the second option with their time.

While the personal opportunity cost for each player is entirely dependent on an individual player's values (and difficult to quantify), it nonetheless outlines a player's rational for conducting a RMT. This equation also automatically assumes a situation like George's where the reward (R) for continuing to play is higher than simply quitting. Why wouldn't a player just quit if the opportunity cost was higher than the value of playing? First, the key difference between normal games and MMORPGs is that MMORPGs are made up of dozens of individual puzzles; there is a motive for completing the unpleasant ones to get to the good ones. Second, players will develop emotional or social attachments to elements of the game that discourage them from quitting outright. Players like George will often grit their teeth and complete an unpleasant portion of the game because the reward of getting back to the fun parts of the game is worth the temporary grind.

What we learn from this model is that the reason that gold farming is so prevalent in popular MMORPGs such as World of Warcraft is because players find themselves valuing working and conducting RMTs more than the in-game mechanics of gaining income. RMTs are not necessarily a way for the players to cheat the in-game system, but a way to maximize the fun of playing the game which doesn't always satisfy them. In this light, developers shouldn't see RMT as a plague, but a vital economic activity that prevents their players from getting bored and quitting outright. Without RMT, many players would be forced to choose between playing through boring content or giving up on the game entirely. Even if the reward for staying is high, being dissatisfied while playing an MMORPG will slowly alienate a player from the game. Games that have a large amount of RMTs have a large amount of players who are

simply bored of grinding, or find that the system of achievement in the game is dull. RMT is therefore not the failure of the virtual game economy, but the failure of game developers to make enjoyable in-game content.

Conclusion: Combat RMT by Improving Game Content

While it may seem obvious to the point of idiocy, games are supposed to be fun. While MMORPG's are an incredible evolutionary leap in video game design and technology, video game developers must still follow the same basic rules as jigsaw designers. The prevalence of RMT in today's major MMORPG titles reveals that players are dedicated to remaining within virtual worlds, but they are not satisfied with the means of earning a virtual living. This causes players to outsource grinding and instead use real world money to progress in the game. Some players will continue to play a MMORPG out of addiction, habit, or social reasons alone, regardless of how entertaining gameplay mechanics are, but most players finding themselves struggling to enjoy the basic mechanics of acquiring virtual wealth will be inclined to consider other options.

MMORPG developers seem to be focusing on preventing RMTs by force, rather than solving the root cause of the problem. Threatening players with sanctions or bans may deter some players from performing a RMT, but it will not fix the underlying problems of the MMORPG. Players seek RMTs when they are unhappy or unsatisfied with in-game ways to generate wealth. The simplest solution to the problem of RMTs is to make virtual wealth generation more fun. If wealth generation is a secondary thought to enjoying playing the game, RMTs will simply cease being an issue.

The root of why RMTs occur is that MMORPG developers too often rely on grinding mechanics to progress through the game. Grinding mechanics are almost cop-outs in terms of game design; they are often used as buffer zones between actual content to lengthen the playable time a developer can squeeze out of its designed content. They are essentially time-sinks, utilized because the most

MMORPGs operate on time-based subscription models. While grinding towards a particular goal (new content, better items, etc.) will lengthen the amount of time a player invests in a game (and therefore developer profits), it will not necessarily contribute to a player's overall enjoyment of the game. If game content is stretched too thin and the player constantly feels like he needs to "work" in the game to progress anywhere, RMTs will inevitably arise.

Eliminating RMTs entirely might be an impossible task, but curtailing their iron grip on popular MMORPGs is not. While some players will inevitably sell virtual items from time to time for reasons unrelated to wealth generation mechanics, (quitting altogether, virtual good surplus, etc.) this is a small portion of the RMT market and would have little or no impact on the macroeconomic in-game economy or game's immersion. Castronova notes that "At low levels of RMT, the externality [to the game developer profits] is \$0."³⁴ So while MMORPG developers consider RMTs to be a spreading plague in their online worlds, it is largely a self-created one that can be born at small level. RMTs are the natural economic response to boring gameplay. If developers want to see the sale of their virtual wealth cease, they should focus on making its acquisition feel more like a game and less like work. If the demand for RMTs is reduced by introducing more entertaining gameplay, it follows that RMTs will be far less prevalent in that virtual world.

³⁴ Castronova.

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