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Order and Creativity in Virtual Worlds

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Abstract

Economies are driven by dynamic creativity, but some sorts of creativity, especially if predatory, can destroy an economy. This tradeoff has been known for centuries to political philosophers who have analyzed physical space, but it has not been addressed in virtual space. Like physical economies, virtual economies face the tradeoff of encouraging freedom to experiment, while discouraging experiments that damage society. Physical societies solve this problem both through encouraging competition and by giving government the unique power to punish destructive activities. In virtual societies, this tradeoff has yet to be adequately assessed. Guided by the economic modeling of order and creativity, in this paper we discuss two types of behavior, constructive and destructive, to provide some guidelines for establishing limitations on the freedom of action of virtual-economy participants.

Keywords: order; creativity; virtual world; economy; governance.

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Order and Creativity in Virtual Worlds

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In his masterwork *Leviathan*, Thomas Hobbes writes:

The only way to erect such a common power, as may be able to defend them from the invasion of foreigners, and the injuries of one another, and thereby to secure them in such sort as that by their own industry and by the fruits of the earth they may nourish themselves and live contentedly, is to confer all their power and strength upon one man, or upon one assembly of men, that may reduce all their wills, by plurality of voices, unto one will: which is as much as to say, to appoint one man, or assembly of men, to bear their person; and every one to own and acknowledge himself to be author of whatsoever he that so beareth their person shall act, or cause to be acted, in those things which concern the common peace and safety; and therein to submit their wills, every one to his will, and their judgements to his judgement. This is more than consent, or concord; it is a real unity of them all in one and the same person, made by covenant of every man with every man, in such manner as if every man should say to every man: I authorise and give up my right of governing myself to this man, or to this assembly of men, on this condition; that thou give up, thy right to him, and authorise all his actions in like manner. This done, the multitude so united in one person is called a COMMONWEALTH. (Hobbes, 1972, p. 227).

The problem of how to organize social authority has preoccupied many of the greatest social thinkers in cultures around the world for thousands of years. Throughout most of this history, the creation of a new society was a matter either for abstract models of societies founded in a state of nature or a question for historians investigating societies from the past. We could look into the results of a society's founding or we could create an abstract conception of what its founding might have been like, but we could seldom observe the creation of a new society.

But thanks to modern information technology, we now can. People around the world now routinely create self-contained societies, importing all the features of the human condition from outside – conflict, commerce, loyalty, betrayal, and more. Such societies are created on the platform of the internet, which has the ability to bring many people together regardless of their physical locations. New technologies, including the much increased bandwidth and speed of the internet and powerful computer systems, have now enabled the creation of much more sophisticated online societies, including virtual worlds.

Virtual worlds can be defined as technology-created 3-D, graphically detailed, and highly interactive environments that incorporate representations of real world elements such as human beings, landscapes, and other objects (Kock, 2008). People participate or “live” in virtual worlds in the form of their avatars, a digital representation of an individual in either human or non-human form. As of 2007, there were more than 100 virtual worlds on the internet, taking various forms and with different purposes (Barnes, 2007). Our study focuses on “real virtual worlds”

such as Second Life that feature the 3-D3C factors (3-D, community, creation, commerce) defined by Sivan (2008),¹ as opposed to gaming societies such as World of Warcraft (WoW).

Commerce is a substantial component of and catalyst for human activities in these virtual worlds. Buying and selling in virtual currency is very common and often encouraged. For instance, in the first quarter of 2009 in Second Life, resident-to-resident transactions reached \$120 million (that number acquired from Second Life's official blog at <https://blogs.secondlife.com/community/features/blog/2009/04/16/the-second-life-economy--first-quarter-2009-in-detail>). In addition, many virtual worlds are peer-created communities where people can build, give away, sell, or trade items with any other resident, just as with property (intellectual or otherwise) in physical space.

But despite their technological trappings, these societies are made up of humans who bring their virtues and flaws with them. The question of how to order a virtual society is in many respects similar to its physical-world equivalent. This topic has never been explored in depth in the information-systems literature. Given the popularity of virtual worlds and their promising role in practice, it is critical to understand the mechanisms of these self-sustaining societies. We believe that the study of governance in physical space can benefit from thinking about how it occurs in virtual space and vice versa. Taking an economic perspective and confining our attention to theory rather than empirical analysis, in this paper we focus on one particular question – that of the proper tradeoff between order and creativity. The insights provide a useful complement to Duranske (2008), who focuses on the implementation of physical-world law, itself shaped by centuries of political theory in virtual space. Here, in contrast, we are interested in whether that theory may suggest the development of different principles for governance in virtual worlds. We are making a positive argument rather than a normative one, so that when we speak of what virtual-world owners “should” do, the argument is made with respect to the needs of profit maximization. We begin by setting out the key issues in Sections 2-4 before investigating in Sections 5-8 the ways in which governance in virtual space, because of its differences from physical space, is likely to be correspondingly different.

Order and Disorder

The question of the proper balance of order and liberty is an ancient one. Hobbes depicted the state of nature absent government as a war of all against all and took the side of order by arguing that the state must be given absolute power to maintain it. For others, such as Locke (1986) or Bastiat (1996), the state itself is not to be trusted with excessive power because that power will be used in destructive ways. It is possible, if not inevitable, that even well-intentioned rules will create unintended consequences that the rule-drafters did not predict, which induce the rulemakers to react with ever-more complicated rules in a futile attempt to achieve the desired outcome, at tremendous consequence to both individual autonomy and social viability. The source of this problem, as the economist Friedrich von Hayek (1994) noted, is that planners know so little about the details of the world they govern that their clumsy rules inevitably cause people to react in unexpected ways, frustrating the planners' goals. The need to

¹ Teen Second Life is restricted to teens aged 13-17. Its highly restrictive and protective policies and unique profiles of its users make it a special case not generally relevant here.

conform to or the cost of evading the planners' rules means that creative activity by individuals in possession of knowledge about particular opportunities, knowledge that is invisible to the planner, is stifled. In the limit, this ever-increasing control culminates in the catastrophe of totalitarianism. Thus, while a Hobbes might assert the need for a powerful state to prevent predatory behavior, a Hayek would emphasize the destructive effects of state control on individual freedom and creativity. There is therefore a compelling tradeoff between the order paradoxically necessary to enable creativity and the power that destroys it.

This tradeoff exists within the specific realm of economic creativity as well. On one hand an agent needs the freedom to experiment – to create a new business (or other social experiment) without restraint. A controlling authority, even a well-intentioned one, may impose so many rules on starting entrepreneurial ventures and on how they are run once they are established, that business costs will be crippling high. Fewer activities, even potentially promising ones, are undertaken, and society is poorer and less dynamic. On the other hand, the entrepreneur requires enforced order to a degree – his property rights must be protected, she must have a court system so that the contracts she enters into can be enforced, and so forth. He may even benefit if the government enforces various kinds of protections against unintentional harm, so that his customers have the confidence to do business with him.

Production and Destruction

These are the problems that governments in physical space face all the time. And in virtual worlds they are fundamentally the same, though different in some of the particulars. Some virtual worlds such as World of Warcraft and the Sims are purely gaming environments, while others, such as Second Life and Active Worlds, are developed for entertainment and commercial purposes (virtual commerce or virtual business). We focus here on these latter types of societies.

Such virtual worlds, which are as full of commercial activity as any physical society, allow users considerably more creative freedom than games. There are no pre-plotted scenarios, avatars do not normally die or lose their lives, and as noted above, these virtual worlds allow creation of content by their residents who, subject to modest limitations, own the intellectual property rights to it. They are worlds in which individuals choose their pattern of interaction, with (in contrast to physical space) few institutional and geographic constraints written into the code by the worlds' creators. Like human society in physical space, such worlds are unpredictable and constantly evolving – they become whatever the users collectively build. For instance, in Second Life, all content is created by its users except for some standard objects provided in the default library repository of “structures.” The ability to create in this way in virtual worlds, and the value such creativity has to users, is the fundamental reason why governance, which can excessively or insufficiently restrict individual creativity, is a balancing act. In virtual worlds, too little creativity limits peer-creation activities and thus makes a world uninteresting and therefore unprofitable, while too much makes it unpleasant or dangerous to the avatars who use it because they are victims of other avatars, either by design or accident.

It is useful to distinguish between two kinds of activity: productive and destructive. Productive activity, through voluntary cooperation with other actors, leaves all who choose to work together better off – in physical space, such profit or not-for-profit activities as opening and operating businesses, or creating new cooperative social institutions such as a Boy Scout troop or

a bowling league. Destructive activity leaves at least one participant in the activity worse off.² And there are two varieties of destructive behavior – intentional and unintentional. Intentionally destructive (ID) behavior has the goal of forcibly limiting others’ options, often by trying to seize their wealth – robbery, war, lobbying the government for special benefits unwillingly or unwittingly funded by other taxpayers, and others. Unintentionally destructive (UD) activities make someone worse off if certain contingencies happen, even though a seller may have (perhaps unreasonably) expected they would not. For example, in the physical world, selling medicine the seller knows to be ineffective but claims is safe is ID, selling food with ingredients purchased from the lowest-cost supplier despite their being subject to poor quality control may be UD, although from the buyer’s point of view the effects are the same. Similarly, ID and UD activities are seen in virtual worlds. Examples of ID behavior there include a “griever” assaulting another avatar (a concept clearly analogous to physical-world assault) or the coding of malicious scripts into seemingly benign objects such as a bouquet of roses. On the other hand, virtual banks may fail, taking the savings of participants with them, a form of UD behavior – the bank was not founded with the intent of destroying savers’ deposits. This exact phenomenon led to a decision by Linden Labs in January 2008 to prohibit any business from offering “interest or any direct return on an investment,” a decision we discuss further below.

The trick for the designer of a virtual world is how to maximize the welfare of its residents knowing that some residents will engage in either variety of destructive behavior.

Modeling the Order-Creativity Tradeoff

A way of thinking about the problem is to imagine first that a (physical or virtual) world’s governing authority has the choice of two regulatory regimes, High or Low. In a Low regulatory regime, there are no limits on individual freedom, while in a High regulatory regime, many activities are prohibited or regulated in the name of order. Assume that the world has two agents (agents 1 and 2), who have the choice of devoting their resources to constructive, ID or UD activity. Figures 1 and 2 show potential distributions of income among the two agents in an economy. The curves AA’ and BB’ in Figures 1 and 2 represent two levels of *potential* income distribution among the two agents (“income” is used in its broadest economic sense – not just the proceeds of salaried labor, but the returns to providing any good or service that is valuable to someone else). The curves represent the Pareto frontiers of each economy – the set of all combinations of income x_1 and x_2 that make it impossible to make either agent better off without making the other worse off, the standard economic definition of efficient operation of an economy.

Note that this definition of efficiency makes no statement about the desirability of a particular distribution of income. At point A, for example, agent 2 has all the income while

² Note that effective competition is not intentionally destructive activity. While it may make other competitors worse off, they have the opportunity to choose to compete on terms that their customers prefer but choose not to. The gains from competition to participants in exchange (including successful competitors) exceed, by the first theorem of welfare economics (Varian, 1992), the losses to the non-participants who fail to win customers. This is why, in the Anglo-American legal system, competition is not a tort (Posner, 2007). Note also that the notion of destructive behavior here is static, and is unrelated to Schumpeter’s (2008) concept of “creative destruction,” referring to the continuous dynamic remaking of an economy through entrepreneurial activity. Such activity will exist in virtual worlds as surely as in physical space, and is as beneficial there.

agent 1 has none, and there is no way to make 1 better off without making 2 worse off. But the usefulness of this concept of efficiency is that it allows us to say clearly that starting from any point in the interior of the curve, at point a , for instance, there are points to the northeast, moving toward the frontier, that are superior because they make both agents better off. The closer the particular combination of incomes is to the frontier, the more efficient the economy is.

This concept of efficiency also allows illustration of the costs of destructive activity. Destructive activity moves us further away from the frontier. Suppose agent 2 grows food, and agent 1 makes clothes. If it is relatively easy for each agent to steal the produce of the other, then some of the resources otherwise devoted to producing food and clothing are instead devoted to protecting their crops and clothes from theft by the other agent – by buying weapons and building walls, for example. If theft is sufficiently lucrative, 1 and 2 devote so many resources to stealing (instead of concentrating on production) and defending their property against theft by the other agent that much less food and clothing are produced. But if the ruling authority can effectively enforce punishment against theft, making it more costly, agents 1 and 2 have an incentive to produce more and steal less, moving them from point a in the northeast direction, toward the frontier, within the dotted lines in the figure. In the limit, if enforcement against theft is perfect, 1 and 2 will end up on the frontier, somewhere (depending on the relative productivity of each agent) in the bolded section of the curve.

What differentiates AA' and BB' is that in the economy subject to productive possibilities BB' there are more restrictions on the ability of participants to engage in different kinds of activities. In the economy with potential production AA' agents are free, for example, to start virtual banks without obtaining a license from the world's authorities (or without being required to participate in a mandatory deposit-insurance program, the analogue of the Federal Deposit Insurance Corporation in physical space), or in physical space to use ingredients that have not passed government safety inspections, and so forth. If in a virtual world the banks are solvent or a partner's code is non-malicious, or if in a physical world the food ingredients are safe, then actual income will be somewhere along AA' , which usually exceeds the outcomes along BB' , in which various regulations of individual creative freedom do exist. AA' is a world with more potential income, because the government does not limit the ability of the farmer and the clothier through costly regulations.

But potential income is not the same as actual income. Potential income is eroded by both types of destructive behavior. The theft of clothing, or the selling of tainted food, means that the actual outcome will be below the frontiers, at point a (with incomes x_1^A and x_2^A) in the Low world and point b (with incomes x_1^B and x_2^B) in the High one. The frontier BB' represents a society that tries to control this loss through regulation. It is a function of such regulation to limit the movement below the curve, while keeping the curve itself as high as possible, but such regulation means that *potential* income, because of compliance and enforcement costs, is less, so that BB' lies inside AA' . A less regulated economy, in other words, raises potential income but may or may not raise actual income for each agent. While AA' and BB' thus represent the set of potential incomes for each agent – i.e., the set of possible outcomes if there is no destructive activity – the distances between a and AA' in the Low world and between BB' and b in the High world each represent the loss of income due to destructive activity in that world.

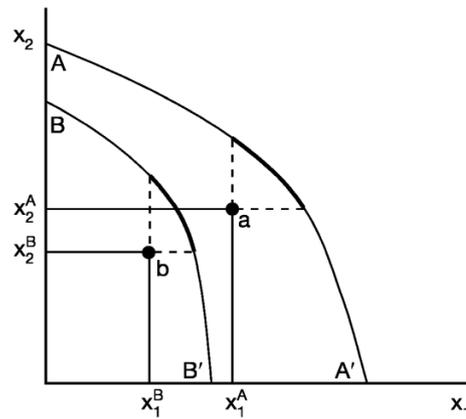


Figure 1. A world where more freedom is preferable.

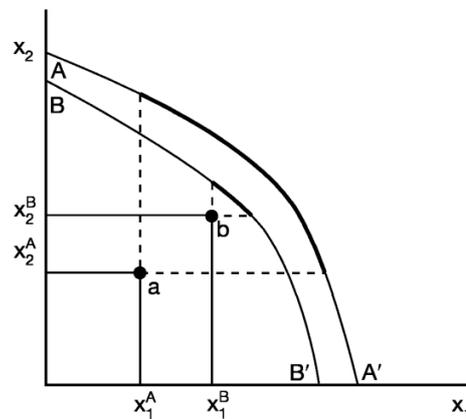


Figure 2. A world where less freedom is preferable.

In Figure 1, actual income in the Low world (low regulation) at a is higher for both agents than at b in the High world (high regulation). But in Figure 2, the losses from destructive activity are so great without high regulation that the actual income for each party in the Low world is much closer to the origin and considerably worse than the outcome with a High regime. In this case, substantial limits on social experimentation are justified despite their negative effects on potential income. The simple model illustrates the classic argument between those who believe in strict law enforcement and enforcement of traditional cultural patterns and those who believe in a more liberal approach in the pursuit of progress (for more analysis, see Raeder, 1997).

Intentionally Destructive (Id) Behavior

The question of interest becomes whether virtual worlds, compared to the physical one, are better served by a Low or High regime. There is no way to answer for certain, but the model suggests some guiding principles. First, ID activity should generally be policed to the extent possible. The model indicates that all ID activity moves the participants in any virtual world away from the Pareto frontier. It is true that entrepreneurs in response to extensive grieving may develop anti-griever tools, which generates wealth for them and (critically, taking for granted the existence of this amount of grieving) for the purchasers of their products. But it is still true that

griefers are on balance wealth-destroying, for the same reason that burglary is wealth-destroying despite the fact that it generates a demand for burglar bars or that breaking windows is wealth-destroying despite the fact that it generates demand for window-repair services. It is wise for virtual worlds to police purely predatory activity to the extent the technology allows. So-called “griefers” mimic physical-world vandalism, assault, and homicide, and (also in imitation of physical-world behavior) frequently do it through organized gangs, with command structures, division of labor and meticulous planning. Their efforts are often profoundly resented by other virtual world users. This is why firms such as Linden Labs take them so seriously. Dibbell (2008) offers an account of the constant war between griefers, their victims, and the owners of virtual worlds.

In fact, virtual worlds often use tiered freedom to limit potential ID behavior. For instance, an island owner can make his island open to anyone, or private, limited to those with permission to enter. If an avatar behaves badly on a private island, the owner can ban the avatar from coming, temporarily, or permanently. Another type of restriction can be imposed on avatars through group affiliations and titles. A group owner is given the right by an island owner to recruit new group members and to give them different classifications, such as member or guest. A guest group member might not be able to view certain content or obtain certain items created by the group members. Such a tiered structure is a way to control ID behavior in virtual worlds, and is similar to management of property in physical space – the bar manager, for example, who is empowered by the owner to expel a disruptive customer.

Constant vigilance against such actions will be a requirement for the success of virtual worlds, all the more so because of the ease with which people can exit virtual as opposed to physical-world societies. Migration among virtual worlds is a little-studied phenomenon, although Castronova (2008) has discussed migration of human activities from physical to virtual space. If a resident of a country in physical space is threatened by widespread violence, her options are sometimes limited to self-defense rather than migration. She may hire security guards or place defense mechanisms in her home, but the high degree of society-specific investments she has made in herself (mastering the local language rather than a foreign one, understanding local business culture but not that of a foreign land) combined with the cost of uprooting her household and moving to a foreign land make migration comparatively difficult. Movement from one virtual world plagued by ID behavior to another where it is much better controlled is, in contrast, a relatively simple act. The control of ID behavior is therefore likely to be a key requirement of successful virtual worlds. The user who in one society must constantly defend his avatar or island is likely to strongly prefer the world where the world’s creator instead effectively does this job for him, just as individuals in physical space prefer societies with law and order to those where they must rely primarily on themselves for defense.

Unintentionally Destructive (Ud) Behavior and the Value of Experiential Variety

The challenge arises with UD behavior. Should the attitude of the owners of a virtual world, absent the intention to defraud (fraud being ID behavior), be one of *caveat emptor*? Or should they maximize the freedom to experiment by their participants, even at the cost of more UD activity?

An answer to this question is suggested by the role of variety in virtual worlds. We believe that the primary attraction of virtual worlds for the consumer is their astonishing variety

and creativity. Variety in physical space is valuable to consumers, though only up to a point. Consumers like to have more kinds of cars to choose from, but too many choices can become paralyzing, as recent research suggests (Botti & Iyengar, 2006). But in virtual worlds diversity of experience is often the goal itself. The proper comparison for the value of variety in virtual-world design is not to a consumer having difficulty choosing from among several dozen different kinds of toothpaste, but to a person who enjoys traveling and wants to visit as many countries as possible. A facilitator of variety in virtual worlds is their low-cost material and resources. Players or avatars are able to obtain many items for free or build them with very low investment. For instance, a collector may be able to obtain a copy of a virtual racing car for free in Second Life, compared to paying large amounts of money for an actual or even replica car in the physical world. Such low costs foster the exchange of goods and increase the value of variety in virtual worlds.

The role of diversity in virtual worlds has been explored before. Castronova (2006) invokes the economic model of club goods to describe virtual worlds. A club good is a good that is public, in that benefits can be provided simultaneously to many members but is also subject to crowding costs when too many people use it simultaneously. More participants can be better for the user because more variety makes the product more enjoyable, but too many participants make the club undesirable, for search-cost (it is too difficult to find a good trading partner) or infrastructure-cost reasons. A country club with too few members is one where opportunities to socialize are limited, but a club with too many members is one where it is difficult to reserve time on the golf course, because building enough courses to accommodate so many users with reasonable waiting times would be prohibitively expensive. The former effects are known as *network effects*, in which the bigger the network of participants, the greater the opportunity for valuable exchange and interaction. The latter effects are *crowding costs*, the difficulties that arise, either from search costs or overuse of the club's resources, from too many members. Castronova argues that as the number of participants increases from zero, virtual worlds benefit from having more players for a time, but crowding costs eventually mean that adding players makes the world less desirable. Note that the crowding costs are not simply the claim on computer time from more users, which can be addressed by the purchase of more processing power and memory, but the actual occupation of virtual space by avatars – the problem, to borrow from the baseball player Yogi Berra's famous remark, of the island that is so crowded that no one goes there anymore.

But we believe that in the worlds under study here the network effect will dominate. While games built around specific achievements and experiences – combat games, for example – may quickly be subject to crowding, games built around social interaction are much less so. For such worlds the variety of potential experiences cannot help but make the experience more attractive, subject to two qualifications. First, the interactions must be primarily productive rather than destructive. Few if any residents participate in virtual worlds in search of more variety in assault by grievers. Second, there must be a technology making it easy to seek out new experiences and to store and retrieve enjoyable ones. If these conditions are met, interaction in a virtual world is not like consumption of such physical objects as cars or food, where decisions are often driven either by a desire for durability or by habit. While an observer just arriving from another planet might marvel at the dozens of breakfast cereals that the consumer in a typical supermarket has to choose from, the average consumer chooses relatively few of them over time. In part this is a function of the quality provided by known brands – a consumer may not wish to risk low quality from a producer he does not know and thus continues to consume the same

brand rather than be adventurous and try another. In addition, many physical products are not bought often enough for variety to be a compelling trait compared to reliability. But in a virtual world like Second Life, visiting many different islands is key to the attractiveness of the experience.

Variety is costly to manufacture, but this effect is much more dramatic in physical than in virtual space. Often producing new varieties of physical-world products is costly, requiring a multitude of resources unnecessary in the virtual world, such as electric power, manufacturing equipment, advertising slots, etc. These resources are much more meaningfully scarce than creativity, which is, because of the low cost of computer processing and storage, the key ingredient in virtual worlds. Recalling that ID behavior, no matter how creative, should always be controlled, what makes UD behavior problematic in physical space is that competition is relatively ineffective as a remedy. But because of the ease of producing variety, competition is more powerful in virtual space than in physical, and thus it is more likely that the losses to UD behavior in a Low world (low regulation) will be outweighed by the much greater potential income. Part of the reason that a bank failure is more problematic in physical than virtual space is that there are relatively few banks in the former, because banks are difficult to start there. Banks in physical space are less limited by this constraint and the fact that it is easier to start one suggests erring on the side of creativity rather than regulation. It is true that Linden Labs recently took the extreme step of banning such financial institutions, but we wonder whether such a response is excessive. It is undoubtedly true that some perhaps significant portion of banking activity in Second Life, as with any kind of economic activity anywhere, was ID. But while ID behavior can and probably should be prohibited (e.g., by banning banking fraud in a virtual world), this does not indicate that an entire economically useful activity should be banned. Such a recognition of the power in virtual worlds of constructive activity is all the true if (as seems likely, since it is so frequent in physical space, where the costs are higher) people in virtual space develop systems for rating the quality of various services (e.g., banks) offered there.

This effect is even more enhanced by the non-arbitrary dictatorship that is likely to prevail in most virtual worlds. In physical space, governance occurs through both more dictatorial and more consensual systems. It is not obvious that a non-consensual ruler, such as a hereditary monarch rather than an elected president, is intrinsically hostile to human happiness. The key issue is not the fact that a dictator is a dictator, but what it is he dictates. If rule is by ironclad custom or otherwise made predictable and non-arbitrary, citizens may still be free to pursue their interests. Dictatorial rule that nonetheless leaves substantial room for individual autonomy within expansive limits, such as took place in nineteenth-century Austria-Hungary or in British-ruled East Asia (Sowell, 1994), might be preferable to democratic societies where the rules – who is permitted to do what, what government services are provided, and who pays for them – oscillate wildly from one government to the next. And virtual worlds are dictatorships, but profit-maximizing ones. The owners set the rules for interaction and social experimentation, but everyone knows what the rules are and knows they are likely to be stable because ownership of the rulemaking power will not change much, and because the ruler's goals – profit maximization – are transparent. Political instability – that is, instability in what the rules for social experimentation and interaction are – is a major deterrent to creative activity. Worlds run strictly for profit may have rules that differ substantially from those in physical space, but they will nonetheless be stable, and hence will lend themselves to more creative experimentation.

In short, in virtual space both demand and supply favor the creation of variety. Less regulation of activity that might be UD allows for more activity that will in the end be constructive, while the losses to UD activities are also minimized relative to physical space by the features of virtual space. Note finally, however, that these arguments are less compelling in the case of virtual worlds designed for the young, where variety that is constructive for adults may be destructive, sometimes even intentionally so, for children.

An Example of Facilitating Constructive Activity in Virtual Space – Intellectual-Property Rules

To summarize, controlling ID activity enhances wealth, but regulating UD activities increases the cost of constructive activity. We believe that virtual worlds will (and should) ultimately be characterized by the promotion of such constructive behavior by taking advantage of opportunities to improve upon arrangements that are inevitably problematic in physical space. Some confirmation of the tilt toward creativity and against restricting it can be found in the intellectual-property rules of Second Life. Note first that intellectual-property protection, particularly copyrights and patents, is in physical space a tradeoff. The granting of a copyright or patent is legal recognition of a monopoly right. Monopolies charge higher prices and produce less compared to a competitive market, and so this monopoly grant is costly. However, if innovations are costly to create but cheap to copy once someone else has incurred this cost, the incentive to create without intellectual-property protection is severely diminished. To see how these issues are handled in virtual space, consider excerpts below from the user agreement of Second Life:

Users of the Service can create Content on Linden Lab's servers in various forms. Linden Lab acknowledges and agrees that, subject to the terms and conditions of this Agreement, you will retain any and all applicable copyright and other intellectual property rights with respect to any Content you create using the Service, to the extent you have such rights under applicable law.

Notwithstanding the foregoing, you understand and agree that by submitting your Content to any area of the service, you automatically grant (and you represent and warrant that you have the right to grant) to Linden Lab: (a) a royalty-free, worldwide, fully paid-up, perpetual, irrevocable, non-exclusive right and license to (i) use, reproduce and distribute your Content within the Service as permitted by you through your interactions on the Service, and (ii) use and reproduce (and to authorize third parties to use and reproduce) any of your Content in any or all media for marketing and/or promotional purposes in connection with the Service.

You also understand and agree that by submitting your Content to any area of the Service, you automatically grant (or you warrant that the owner of such Content has expressly granted) to Linden Lab and to all other users of the Service a non-exclusive, worldwide, fully paid-up, transferable, irrevocable, royalty-free and perpetual License, under any and all patent rights you may have or obtain with respect to your Content, to use your Content for all purposes within the Service. You further agree that you will not make any claims against Linden Lab or against other users of the Service based on any allegations that any activities by either of the foregoing within the Service infringe your (or anyone else's) patent rights.

The first feature of the agreement worth noting is that in any virtual world, physical-world copyright law does not cease to hold. Anyone who writes a song and incorporates it onto her island in a virtual world still holds all legal rights to the song that she possesses in physical space in her country. Whether copyright can be meaningfully enforced in virtual space, particularly given that companies may incorporate anywhere and the identities of those who appropriate copyrighted material may be harder to trace, is a separate question.

But apart from these exceptions, Second Life allows any resident to click on an object and learn the rules on distribution and modification that the creator has attached to it. That the creator can define such rights so easily is the key point. Avatars in Second Life have the ability to create almost any digital content – a table, a tree, a store, or even a whole city. Such content is owned by the creators, who can make copies of, sell, or give it away. For instance, the popularity of fashions for avatars has led many people to open fashion stores in Second Life. Clothes, accessories, and even body shapes and skins are created and put on sale by the owners. The incentive to create such things is diminished if the owner cannot control re-use or modification. Such control can be motivated by emotional satisfaction as much as a desire to make money.

But Second Life uses technology to vest the creator with a near-absolute intellectual-property right that the physical world can only crudely duplicate through such tactics as copyrights and patents. Physical-world enforcement of intellectual-property rights generally involves uncertainty over such questions as whether an invention is truly novel, or whether fair use should govern the reproduction of a book excerpt. Such questions often create expensive litigation, and new technology generates new issues that may take years to resolve in the courts, creating delay that may retard innovation further. But Linden Labs has used technology to create a near-perfect property right for objects, songs, and other creations, with the only limitation being the ability of other residents to circumvent the Second Life code that allows creators to set the rules for use of their creations. This means that Linden Labs itself generates the property right, which is defined, without the need of courts or cease-and-desist letters, in near-absolute terms. If a creator wishes to use someone else's creation as the raw material for his own, he simply negotiates an agreement with the owner, pays the agreed-upon price and then has complete access to it. Intellectual property in Second Life (with the exception of the prohibition on taking creations out of Second Life into another virtual world) duplicates the theoretical ideal of economic models of intellectual property, and thus maximizes the creativity that physical-world laws can only imperfectly promote. This is unsurprising, given that the monopoly costs of intellectual-property rights are lower in an environment such as Second Life, assuming that consumers desire variety and that the creation of variety is easy.

Transparency

UD activities are still costly, although they are a negative side effect of an activity that may be on balance beneficial. How are they to be policed? Transparency is the key requirement. Transparency here refers to the ease with which users can obtain information, financial and otherwise, about the partners they contemplate doing business with. In physical space this is accomplished through both public and private means. The former include such reporting and monitoring agencies as the Securities and Exchange Commission, as well as the policing of fraud. The latter includes such devices as standards set by the accounting industry and groups, such as Consumers Union, that test products for reliability. Virtual worlds should

make it easy for any user to access the history and reputation of any commercial enterprise, perhaps through such tactics as establishing (or importing from physical space) accounting standards that its enterprises must adhere to and make readily accessible, or allowing (and making easy) the creation of ratings from other enterprise customers. Since users will be able to create on their own a wide variety of assessment or vetting methods for virtual businesses, the world's owners need only not to prohibit the creation and use of such methods. We predict, because of the ease of search in virtual space, that the development of such ratings systems will become a common feature of virtual worlds, and perhaps even a substantial money-making opportunity in its own right.

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