The Constitutional Political Economy of Virtual Worlds

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In virtual worlds, a social order able to coordinate the actions of tens of thousands of people emerges in a non-predetermined but designed way. The central puzzle the developers of such worlds have to solve is the same political economists face: to establish a well-functioning set of rules allowing for the thriving of the regulated community. The purpose of this paper is to provide a discussion of the particularities of the constitutional political economy of virtual worlds: their institutions, the prevalent beliefs of the players, and their organizations. The main reason why we should care about doing research *on* virtual worlds is the huge potential for research *in* virtual worlds. Virtual worlds present a middle ground in the debate between the greater control of laboratory experiments and the higher external validity of the field. Besides being an important cultural phenomenon per se, they emerge as the researchers' tool to conduct experiments on a truly social level with tens of thousands of subjects. To show the usefulness of such environments for research in political economy in an exemplary but concrete fashion, the paper also presents some findings difficult to be produced elsewhere: data on an astonishingly high percentage of altruistic behavior in a Hobbesian natural state drawn from a dictator game played online.

1 Introduction

Starting from an empty and anarchic cyberspace, social order and the "government" maintaining it emerge in virtual worlds – but somewhat different from real world scenarios. However, the central puzzle the developers of such worlds have to solve is the same political economists face: to establish a well-functioning set of rules allowing for the thriving of the regulated community (Buchanan, 1975; Hardin, 2006). The purpose of this paper is twofold. First, to provide a discussion of the particularities of constitutional political economy in virtual worlds in order to make virtual worlds accessible to research in this area. Second, to present some findings on altruism and social conflict in a virtual natural state. These findings show, in an exemplary but concrete fashion, the usefulness of such environments for research in political economy. The main reason why we should care about doing research *on* virtual worlds is the huge potential for research *in* virtual worlds.

Generally speaking, a virtual world is "an electronic environment that visually mimics complex physical spaces, where people can interact with each other and with virtual objects" (Bainbridge, 2007, p. 472). This paper will turn to the example of the massively multiplayer online video game "EVE Online" (EVE) in order to illustrate the central arguments made. Massively multiplayer online games (MMOs) are computer games played online by thousands of concurrent users at the same time. They feature persistent virtual worlds existing independently of the individual player – typically themed as fantasy- or science-fiction-worlds – in which the players role-play their *avatars*. "Avatar" or "character" is the name for the virtual alter ego of the player. It is the virtual person whose actions the player controls over the human-computer interface, i.e. with mouse-clicks and keyboard-commands. Not only do players identify with their avatar and try to advance her in game but MMOs are also inherently social games in which cooperating is essential for success and in which stable communities of players and distinct social institutions evolve.

Virtual worlds have "great potential as sites for research in the social, behavioral, and economic sciences" (Bainbridge, 2007, p. 472) and might even become the "Petri-dish of the social sciences" (Castronova, 2008). Whereas e.g. biologists study cells and can easily grow and manipulate different cell-cultures, social scientists, for practical and ethical reasons, cannot just grow a society and test how it reacts to the spreading of an infectious disease or how its economy performs when a war wreaks havoc. Unless they turn to virtual worlds and societies (e.g. Balicer, 2005; Lofgren & Fefferman, 2007). Virtual worlds present a middle ground in the debate between the greater control of laboratory experiments and the higher external validity of the field. Besides being an important cultural phenomenon per se with millions of people playing them around the globe, virtual worlds emerge as the researchers' tool to conduct experiments on a truly social level with tens of thousands of subjects.

Several unique properties of virtual worlds underlie this potential. First, they are more *controllable* since they are digital environments. Everything a user does can potentially be monitored and the exact sequence of his actions can be determined. Yet it is still *field work*, since all the interactions are embedded in the day-to-day life of the players. For research in constitutional political economy in particular, it is of high value that virtual worlds are quite *young*. The average age of a current MMO is about four to five years. These time spans – in which a true history, distinct institutions, etc. emerged – are manageable ones. All the debates about which institutions are the right ones to govern the virtual world are recent and still recorded (text-based) in internet forums. Using virtual worlds, one can retrace the making of a culture and its specific institutions from the very beginning. At their accelerated pace, virtual worlds live through all the stages from an anarchic natural state via communities governed

by informal institutions to societies regulated by "constitutions". The seminal findings of North and Weingast (1989), North (1990, 2005), or Greif (1993, 2006) were produced by looking at historical data. A complementary way is to look at the digital data of virtual worlds.

Thanks to collaboration with the game's developer, the empirical data basis of this paper comprises the entire logged server data of this game in January 2011. The around 66GB of data (corresponding to about 13,000,000 pages of plain text) encompass practically everything the 390,000 active players did.[1] To my knowledge, this is the first time that behavioral research in virtual worlds is conducted by evaluating the unmediated server data instead of relying solely on qualitative data like Internet forum posts, personal experience, other players' reports, or interviews with the developers (which will be used to complement the picture).

In order to present the particularities of the constitutional political economy of virtual worlds in a systematic way, the first part of the paper will rely on the framework proposed by North, Wallis, and Weingast (2009). After a short introduction to EVE Online (section two), section three will discuss in detail *institutions* (3.1), *beliefs* (3.2), and *organizations* (3.3) in virtual worlds. It will be shown that the challenge for real world political economists to address the "central problem of violence in human societies" (North et al., 2009, p. xi) is analog to the one game developers have to solve for the virtual world. The second part, then, highlights the benefits of virtual worlds as a research tool in a concrete way. It presents exemplary findings from a simple online dictator game testing for altruism in a Hobbesian natural state (section four). This is important since despite the valuable theoretical efforts in the economic theory of conflict (e.g. Tullock, 1972, 1974; Buchanan, 1975; Hirshleifer, 1995, 2001; for an overview see Garfinkel & Skaperdas, 2007; Skaperdas, 2006), conducting empirical research on conflict remains a complicated issue. The data quality on violent social conflict in the real world is infamously low. Communities stuck in the natural state are inherently chaotic and obtaining "objective", non-ideology laden information concerning their status quo is difficult. Moreover, whenever the focus shall be on individual behavior, microeconomic data is almost impossible to secure given that it would have to be gathered right on the battlefield. In this respect, virtual worlds featuring a virtual natural state are a promising way for providing new clear and distinct evidence on social interactions in such scenarios. The paper finds that an astonishingly high percentage of EVE players seems to be willing to engage in altruistic or at least polite behavior. Probably, this comes as a surprise to some who study virtual world governance or behavior in anarchic settings in general. Section five concludes.

2 EVE Online

"EVE Online" was published by *CCP Games* (CCP) in May 2003. EVE is a science-fiction themed game about trade and conflict in the remote future. The player's main activity is to steer a spaceship through a galaxy far away and to compete with other players – in both economic and military ways. In January 2011, EVE had more than 390,000 active players and an average of around 30,000 concurrent users logged in at any time of the day. Over the last three years, the average yearly population growth rate was slightly over 17 per cent. These numbers make EVE one of the internationally most successful MMOs at the moment.

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[1] The extent and structure of the data can be found in Appendix A.

The average EVE-player spends around *17 hours per week* playing and has been active for *two years* (Guðmundsson, 2009a, p. 12). 95.7 per cent of the players are male players; a very high proportion even for the MMO-genre. The players come from nearly every country in the world, with the top three being the United States (36 per cent), the UK (11 per cent), and Germany (9 per cent).

Insert Fig. 1 Age distribution of the population of EVE at the end of January 2011 from 13 years to 69 years of age (representing 99.8 per cent of the population)

Figure 1 shows that apart from the outliers at ages 33 and 34[2], EVE has a rather smooth age distribution. The average age of the player is around 31 years. Across different MMOs, Yee (2006) has gathered occupational data over a three-year period. He finds that the biggest share of players (around 50 per cent), irrespective of gender, is full-time employed. The second largest group is full-time students (around 20 per cent).

EVE features a thriving, almost completely player-run economy in which the developers very rarely intervene. Although EVE does not have a domestic territory, it is a clearly delimited economic area and possesses its own currency: ISK ("InterStellarKredit"). The exchange rate between ISK and EUR in January 2011 was about 1 ISK = 0.000000051 EUR, or respectively 1 EUR = 19,444,364 ISK. This exchange rate can be calculated since in EVE there is a possibility of buying in-game currency with real-life money: the PLEX-system. Players can buy a PLEX[3] in CCP Games' real-life online store for the price of EUR 17.495 (in January 2011). If they do so, a PLEX appears as an in-game item in their virtual inventory. In a second step, this virtual item can then be traded via the in-game market for in-game currency. Thus, the process comes down to buying a virtual item for real money. Calculating the monthly average for the price of one PLEX in the in-game market in January 2011 (340,179,152 ISK) and dividing it by the cost of one PLEX (17.495 EUR), yields the exchange rate mentioned above. It is, basically, the average number of ISK that you could buy in January 2011 with one Euro.

Over the years, the money supply has been constantly growing in EVE – as has the population. Periods of mild deflation were always followed by periods of mild inflation and overall EVE turns out to be a very stable economy (Guðmundsson, 2007, 2008, 2009b, 2010c, 2011). In December 2010, the money supply M1 for EVE's economy amounted to 445 trillion ISK (around 23m EUR).

Generally speaking, earning money is the single most important task in EVE. One simple process of how players can earn virtual money is to mine asteroids in space in order to acquire ores, to refine these ores later in nearby stations (i.e. making "minerals" out of them), to manufacture simple or advanced products with these minerals as input, and finally to sell the produced goods on the market. The current *daily trade value record* (from December 2010) of trades executed via the market system in EVE amounts to 1.8 trillion ISK (around 90,000 EUR) raised in more than 1.2 million individual trades (Guðmundsson, 2011, p. 6).

> "The industrial and market component of EVE is every bit as harsh and competitive as the PvP[4] aspect of the game. Players compete fiercely with each other as they battle to lower production costs or outbid each other on the open

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[2] There is no obvious explanation besides players willingly entering a wrong age when registering their account.

[3] PLEX is short for "30 Day Pilot License Extension".

[4] "PvP" means player-versus-player combat, and thus the military aspect of EVE.

market. They also compete in the mining sector by adding to and advancing their skills in order to boost returns and reduce waste, often investing significant effort to increase their efficiency by just 1% at a time." (Guðmundsson, 2008, p. 4)

This stylized production process also is a fairly short but reasonably exhaustive description of the supply side of the EVE economy. Individual players trying to advance their characters and wanting to buy better equipment are an important demand force in EVE's economy. The single most important factor of the demand side of EVE's economy is replacement of destroyed equipment due to fights.

3 Particularities of virtual constitutional political economy

3.1 Virtual formal institutions and the developers' role

The central problem of any game developer is also a key one to constitutional political economy: to establish a well-functioning set of rules allowing for the thriving of the community. Consider the following story of one of EVE's chief developers.

> "Nobody controls EVE. ... We can never be certain before something hits Tranquility [the name of the EVE server; C.D.M.] and anyone that claims they can foresee all changes and their effects is plain ignorant. How can one assume what 130.000 people will do with something? I don't know the answer, but I'm frequently asked that question. ...
> Let's assume we're adding a brick to the game. One person will take that brick and hit you on the head. The other guy will wait till you pass him by, then hit you on the head, to decrease the chance of retaliation.
> Then there is a third guy, having watched the behavior of some brick users, waits patiently at a distance for the first guy to hit the other guy over the head with the brick. Then throws the brick at the last guy's head and takes the loot from them all.
> Yet another guy will take it and try to trade it for profit. That means some guy is buying the bricks. Why? The guy buying got tired of hitting people with bricks and asked himself, maybe it would be better to build a house with all these bricks so nobody can hit me? Then yet another guy decides this house thing is a good idea, teams up with some friends and builds a castle.
> You can insert anything you like instead of that brick, it applies to everything that changes the game, people will do different things with the tools they are given." (CCP Oveur*, 2006)[5]

This quotation echoes findings of Morningstar and Farmer (1991). According to them, central planning is not a suitable strategy to control and govern MMOs as acts

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[5] When the developers or players of EVE post their opinion in the official EVE Forums, they use their in-game character name to sign it. These are the fictitious names of real people. Since there is no way of finding out the real name, this paper will use the character names instead for referential purposes. To distinguish real names from fictitious character names, each character name will end with an "*". The developers are posting in forums using their developer names that always have a "CCP" put in front of them (e.g. "CCP Explorer*" or "CCP Xhagen*"). This enables us to distinguish between player quotes and developer quotes in forums.

of social engineering too often have to rely on stereotypical assumptions about player motivations – and are thus doomed to fail.

Yet, despite the similarity of fundamental problems there are particularities of constitutional political economy in virtual worlds. In many aspects, the developers of the game take over the role of the State in the virtual environment. However, the developers (or short "devs") are not members of a political organization with a legal monopoly on the use of coercion in a specific area (cf. Weber, 1947, p. 156). Lastowka (2010, pp. 75–101) for example gives a powerful argument why such an understanding of the State is no longer applicable for virtual environments. He notably highlights that cyberspace is a very peculiar form of space not easily squared with traditional ideas of territory. More than that, CCP Games is an Icelandic corporation which aims at making profits. The players, i.e. the members of the virtual society, are not able to exert direct influence on who rules them and which laws are enacted. True, compared to real life it is very easy for the players to "vote with their feet", to quit playing the game and switch to another one, i.e. to emigrate. Therefore, the developers generally listen closely to what the community says and tend to follow their wishes. It has to be considered though that the players' big investment in time to build up a distinguishable online identity in one community might severely mitigate the viability of this *ultima ratio* of the player (Johnson, 2001, p. 330). The flip side might be the threat of simpleminded majoritarianism on the developers' side (Grimmelmann, 2006, p. 154).

However, the most important difference between virtual and real world is that this peculiar kind of "State" is not only able to enact "classic" laws but also to define "natural laws" – which shall be called *game mechanics*. In the virtual world as well as in the real world, *institutions* are the "rules of the game" (North, 1990, pp. 3–4). But in the virtual world, the devs are the creators of the very game, the devs are somehow God-like (e.g. Bartle, 2006; Balkin, 2006). Lessig (1999, p. 6) sees this "Godly" power as related to the fact that the devs are in charge of a new regulator that comes into play in virtual words: code. Since "code is law" (ibid.), and since the devs are the lords of the code, they gain extraordinary power. The virtual world is their creation and every "natural law", i.e. every single game mechanic, can be coded. They can determine what the physical surroundings look like and every physical law, too, e.g. they would be able to make all things fall to the top rather than to the ground. Lessig argues that in real world environments everybody is subject to both laws that are man-made and others that are not (1999, p. 10); whereas in virtual worlds the devs are those in charge of *all* laws that structure behavior in a given situation. "The rules in … [virtual worlds] are imposed, not through sanctions, and not by the state, but by the very architecture of the particular space" (Lessig, 1999, p. 20). Post (2001, p. 201) highlights in this respect that virtual worlds can be said to not simply be *governed* by rules of conduct but only *come into existence* because of these rules. Without the software-enforced game mechanics there would be no game to be played. This is also why "[e]very decision made by the designers of a virtual world is a political decision" (Grimmelmann, 2006, p. 146) in a deeper sense. Every design decision enables some types of behavior of coming into existence and forbids – in an absolute way – other courses of action.

Every institution that the devs really want to enforce can therefore easily be given a 100 per cent compliance rate and this power extends beyond physical laws to establishing constitutions or the economic legal framework. There shall be no theft? No problem, the possibility of robbing in-game items from other characters is deactivated or not even coded. There shall be no killing? No problem, you just make other characters unattackable. Although product of human deliberation, such game mechanics are not

enforced by the "State" but by the game software itself: Some actions can be made technically impossible in virtual worlds.

The existence of a second type of formal rules in virtual worlds for which the adoption/enforcement is 100 per cent sure, however, does not seem to greatly alter other characteristics of formal institutions, namely how they emerge, or how they change (Mantzavinos, 2001, pp. 83–100). The fact that formal rules typically *emerge* as the final outcome of a deliberation process is true for the real and the virtual world. The initial impetus for a new virtual law may be a new solution to a social problem that *spontaneously* emerged within the community – but in the end it is the "State" (CCP Games) that consciously decides on the exact scope of the institution. Ludlow (2001, pp. 10–16) argues that the formal rules of virtual worlds emerge in conflicts between the developers and the players rather than between players and real world governments.[6] He also describes how virtual forms of government might switch back and forth between more aristocratic and more democratic forms due to the particularities of virtual worlds (also cf. Mnookin, 2001). But in the end, whether this deliberation takes place among the elected members of a democratic government or among the employees of a corporation is not important with respect to the mechanics of its emergence.

However, unlike in the real world where formal rules develop after informal rules with respect to time, in computer games formal institutions are the first to exist. This is because at the beginning the game is a product of design through and through. The game mechanics and the laws applicable to the game exist *before* the first player enters the virtual world. Only over the course of time – and notably dealing with the creativity of the player community that (ab)uses the environment and tools the developers gave to them – do the informal institutions of the community and maybe new formal rules emerge. In virtual worlds, the evolution of institutions does not proceed from informal to formal rules but from formal rules to informal rules back to formal rules.

Also, real world formal institutions tend to *change* either because of external aggression leading to the rise of a new protection agency; or the change may be "initiated by many individuals acting collectively in order to respond to a new social problem" (Mantzavinos, 2001, p. 95). The first reason might not be perfectly applicable to online environments. Although one could argue that CCP Games, being in constant competition with other MMO producers, would certainly adapt the formal rules of the game if too many players were about to switch games because they liked the different rules much better. The second reason, however, applies to real life and virtual life. Kjarval (2011), Lead Game Master of EVE, states: "It is hard to tell who has the biggest influence on the evolution of EVE. … We aren't alone in developing the game." Turbefield and Óskarsson (2011; researcher and community

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[6] There are important problems in the relationship of virtual governments and real world governments. To give only two examples: Who is the actual sovereign when jurisdictions overlap or clash (e.g. Barlow, 2001; Lessig, 1999, pp. 21–22; Ludlow, 2001)? Or: are not the the End-user license agreements and Terms of Use of the software, i.e. contract law, rather than in-game behavioral rules the only really important laws when it comes to the governance of virtual worlds (e.g. Lastowka & Hunter, 2006; Lastowka, 2010, pp. 89–96)? To answer such questions, it seems to be important to provide a cogent argument for either a weak or strong concept of the "magic circle" that is said to protect virtual worlds and games in general from real world legislation (e.g. Fairfield, 2009). However, these are questions about the relationship between virtual and real world constitutional political economy and thus not in the focus of this paper.

manager) add: "The big new inventions certainly come from the developers but the community does a lot of small things." This is possible, since the interaction between player community and developers is extremely good in the case of EVE. In this respect, it is characteristic for both real and virtual formal institutions that they can theoretically change over night, whereas informal institutions tend to be much more resilient.

To summarize: In virtual worlds, a second group of formal rules emerges next to State-enforced laws, namely the natural laws (game mechanics) of the virtual environment. This is a significant particularity and due to the fact that computer games are technologically created environments. The processes of emergence and change of formal rules are not affected by this.

3.2 Beliefs in virtual worlds

According to North et al. (2009, pp. 28–29), people "are trying to accomplish the best outcomes with their limited resources and choices, but how they behave depends critically on how they believe the world around them actually works". As the virtual world around the players works in a very particular way, very specific beliefs arise. In MMOs, people have *violent beliefs* – in the very special sense that people expect a lot of violence or aggression to happen to them. For example, the first two rules new players are typically told in EVE are: 1. Trust nobody. 2. Do not fly what you cannot afford to lose – because you will lose it eventually (e.g. Luminus Mallus*, 2010). These beliefs about how the virtual world around them functions seem to be highly warranted given the environment the players face.

The two single most important actions in EVE are producing and fighting – just as Buchanan (1975) postulates it in his economic approach to anarchy. Piracy, i.e. killing[7] other people for a living, is an officially recommended job. Asked whether players of EVE *like* the unique anarchic atmosphere of EVE with all of its consequences or if they *only accept* it, almost all developers agree that they actually like it (Eriksen, 2011; Guðmundsson, 2010b; Hinrichsen, 2011; Turbefield & Óskarsson, 2011). Of course, players complain when their ships are destroyed and threaten to quit playing the game but "people may rage on the forums but they don't quit" (Guðmundsson, 2010b).

This predominance of conflict-endorsing preferences on the players' side that underlies the prevalence of violent beliefs can also be shown with respect to spatial considerations. Designing the game, the developers figured that there should be some relatively safe areas (exempt from the natural state), notably intended to allow new players to get used to this new environment a little bit before actually being shot at. To that effect, they programmed a tripartite universe. There is *high security space* ("hisec"; security status of the solar system between 1.0 and 0.5) in which a computer-controlled virtual police actively enforces property laws, *low security space* ("lowsec"; security status between 0.4 and 0.1) in which there is only passive enforcement, and *null security space* ("nullsec"; security status equals 0.0) in which there is no police at all and no property rights apply. For example, if you attack your opponent *in hisec*, police ships will quickly arrive and retaliate by destroying your ship. The police ("CONCORD") will arrive so fast that you probably do not even have the time to destroy the other person's ship. They arrive *every time* somebody attacks an innocent and will *always eventually kill the perpetrator*. Additionally, your personal

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[7] A *kill* is the in-game term for the intentional destruction of the space ship of a fellow player.

"security standing" will be lowered as a consequence of every crime you commit.[8] If you commit the same crime *in lowsec* however, the police will not destroy your ship and the security standing decrease is the only sanction. *In nullsec*, finally, you can do whatever you like. The police will not take notice of what you do there. There are neither property rights nor a police fleet that enforces them. You can always choose as a player, whether you want to fly around in relative security (hisec), in an area of lower security but in which still some laws do apply (lowsec), or in a purely anarchic environment (nullsec). The players of EVE thus have the possibility to vote with their feet and to choose their preferred form of government from this set of three alternatives with relatively low effort.

The voting results are quite telling: From March 2009 to June 2010, of those characters that were active in EVE (in the sense that they logged in at any time) around 53 per cent of the characters were living in hisec space, 8 per cent in lowsec, and 39 per cent preferred the total anarchy of nullsec (Guðmundsson, 2010a, pp. 9–10). Although more than half of the characters "live" in hisec, more than half of the 327,911 *player kills*[9] that happened in EVE in January 2011 took place in anarchic nullsec (figure 2). Clearly the players make use of the less strict sanctions for killing in lowsec and especially in nullsec.

Insert Fig. 2 EVE's living area and fighting area

The preference for a quiet virtual life unaffected by violence thanks to governmental law enforcement is clear – but the fact that more than one third of all players chooses to live in the virtual anarchy of nullsec is stunning. In EVE, many people voluntarily continue to live, in an area of a constant war of every man against every man (Hobbes 1651/1998, p. 84).

This is an important finding in itself, since the higher risk players expose themselves to in nullsec is not offset by higher potential rewards. Hisec is where the money is made in EVE (BLINDED, 2012, pp. 115–119). Overall, social conflict in EVE provides empirical evidence for one of the recurring themes and assumptions made in the field of the economic theory of conflict: "*The way of production and exchange* enlarges the social total of wealth. *The way of predation and conflict* merely redistributes that total*" (Hirshleifer, 2001, p. 2). Talking about piracy alone (i.e. excluding more severe and organized forms of conflict like formal war declarations), and adding up all the different sources of destruction (destroyed ships, destroyed cargo, etc.), the significant number of 3.1 trillion ISK lost is reached for January 2011. This corresponds to around 160,000 EUR or 7 per cent of EVE's M1, respectively.

To summarize: EVE is an environment featuring lots of conflict-endorsing preferences. Additionally, many MMOs consciously choose not to enact too many rules hampering conflict – conflict being one of the archetypical features of games (Huizinga, 1955, p. 5). Thus, one can reasonably expect more violent beliefs (in the special sense of people consciously realizing how nasty, brutish and short their life might just be) in virtual worlds than in real worlds. This predominance of violent beliefs is a clear sign that, in the case of EVE, we are dealing with something similar to a virtual Hobbesian natural state.

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[8] The *security standing* is a number between +10 and -10 attributed to your avatar. If your security standing gets too low, you are no longer allowed to enter hisec without getting attacked by the police. Bringing your security standing back up after you committed a crime generally means a lot of time and effort.

[9] That is a kill that involves a humanly controlled avatar as a victim and *at least one humanly controlled character acting as an aggressor.*

In contrast to the very generally applicable statements about how institutions work in virtual worlds, these findings concerning violent beliefs have to be qualified. Not every virtual world features a natural state endorsed by the player base and supported by a non-interventionist policy on the developers' part. For the *social scientist in general*, this limitation makes EVE a less representative example when talking about research in virtual worlds. But it does not necessarily make EVE a bad example when talking about the discipline of *constitutional political economy*. For example, the overemphasis on conflict has the positive effect of turning this MMO into an environment where we can actually study the violence typical for a natural state in a precise and ethically unobjectionable way. This point becomes very clear when you think about the ethical considerations arising from planning a laboratory experiment on people intentionally engaging in social conflict and seriously harming each other. EVE offers the possibility to study violent social conflict in a natural state based on very accurate and encompassing data.

3.3 Virtual organizations

"In contrast to institutions, *organizations* consist of specific groups of individuals pursuing a mix of common and individual goals through partially coordinated behavior. Organizations coordinate their members' actions, so an organization's actions are more than the sum of the actions of the individuals" (North et al., 2009, p. 15). Nearly every virtual world has a system in place that allows for the formation of permanent organizations of players who like to adventure together or to fight against other organizations. The online life of the player centers on the interactions in his chosen organization as the social aspects are the single most important factor when it comes to the success of a MMO. Relationship formation (i.e. the "desire to interact with others and willingness for meaningful relationships that transcend to real life" (Yee, 2006, p. 22)) is the key motivator for most players. And virtual organizations are where people meet each other.

What distinguishes virtual world from real world organizations is the *conscious design of the social architecture*. Take for example the "necessity of grouping" (Yee, 2009). Most MMOs require players to work together. The most common mechanism is that, as players advance, it becomes harder to defeat the computer-generated adversaries on your own. In the long run, the only path to sustainable success often is to assume very specialized roles (e.g. as a fighter, producer, trader) within the scope of a common endeavor. MMOs differ with respect to their "soloability" (Yee, 2009), i.e. the possibility to play the game without the help of others. The lower the soloability, the more prone the MMO is to create spontaneous organization of players. And whereas many real world organizations form for the exact same reason of offering greater efficiency due to division of labor, the difference for virtual worlds is that it can actually be varied how useful it is to team up with others. For example, it could actually be made detrimental by programming a pro-egoistic world.

In EVE, by definition every player is always a member of a *corporation*. Corporations (or "corps", for short) are formal organizations of players. Corporations may be headed either by a real human player or by a computer-controlled avatar. New players automatically join one of the 28 NPC[10] corporations, formally lead by a computer-controlled avatar, but are free to become a member of a player-run corporation immediately (and to switch back to being a member of an NPC corporation again). NPC corporations provide a loose connection and low levels of

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[10] A non-player character (NPC) is a character in EVE whose actions are controlled by the game-software itself in an automated way and not by a human player.

trust among the members, since players are allocated randomly into these corporations and, thus, typically do not know each other. Around 50 per cent of the players stay in (or return to) an NPC corporation (Guðmundsson, 2010a, p. 9). In contrast, the other half of the players are members of one of the 74,000 player-run corporations that range in size from one-member corporations to about 1,500 members. Corps are the smallest political units in EVE – and for large parts of EVE (namely the hisec and lowsec territories) the most important. Corporations compete with others on the market, cooperate with other, friendly corporations, and go to war with their enemies. There are "global" corporations with members in every time zone in order to be able to play EVE around the clock, corporations that found virtual banks to which every EVE player has access, and mercenary corporations that take money for hunting down and killing a specific player or for going to war with other corporations. Players formally apply to become the member of a successful corporation – just as they would for a real-life job (a look in the corporation/alliance-recruitment forums is very enlightening in this context (CCP Games, 2011)).

Beyond the ease as well as the pros and cons of grouping, the social architecture set by the game designers also determines which *tools* the users can employ to organize their groups. Avatars in MMOs – unlike other computer game alter-egos – typically are designed for social interaction. You can easily contact other users via text-based- or voice-chat, you can add them on your *friends list* so you get informed whenever they are online. Groups are often given special tools to cooperate group activities like a private chat channel or an easy way to identify the location of the members. In EVE, typically only the players of the same corp communicate with each other using voice chat, which greatly facilitates real-time coordination of actions. Beyond a built-in voting system which may be used by non-autocratic corporations for reaching group decisions, corporations also get access to special "corp hangars" in which jointly owned equipment may be deposited. And only corporations have the possibility to "tax" their members a certain share of their income in order to finance themselves. All of this hinges on the designers' decisions.

However, although the pre-designed social architecture as given by the game mechanics has to be in place before the first player enters the world, it may be subject to change. MMOs are flourishing and spontaneously evolving environments in which thousands of players interact on a daily basis. Thus, it should come as no surprise that players creatively adapt to their environment and try to shape the world they live in with respect to facilitating cooperation and maximizing social gains. For example, soon after the launch of EVE, players were already looking for a way to formally organize themselves on a higher level than the already built-in corporation-level. Many new players had joined the game since the first publication, so corporations just got too "small" for organizing that many people. The developers of the game reacted to this demand for higher-level organization with a first proposal on introducing *alliances* (structurally speaking, alliances are associations of *corporations* while corporations are associations of *players*) that was widely discussed and in some points heavily criticized (CCP TomB* et al., 2004a). After this experience, another, very different proposal was made that was more widely accepted and that finally got introduced (CCP TomB* et al., 2004b). If one looks at the discussions that took place among the players and developers and at the use the players eventually made of the newly introduced alliance-system, it is hard to argue that the institutions and organizations in EVE are not adaptive just as they are in real life: They are ever-changing and adjust to the needs of the virtual society going transcending their initial, static status.

Today, *alliances* evolved in EVE as formal organizations of corporations, bringing together very specialized corps. The biggest alliances have thousands of member

players. Alliances are the single most important political, economic, and military actors in nullsec space – providing infrastructure and protection where the developers only created empty, lawless space. Living in nullsec with your character, being part of big alliance that formally claims territory and defends it against other alliances is the endgame of EVE, the long-term goal of many players. However, becoming competitive in nullsec alliance warfare takes the average player about two years of gaming (Guðmundsson, 2010c, p. 10).

Even a third level political organization emerged in EVE. EVE is the only MMO that possesses a democratically elected political organization that formally represents the views of the players vis-à-vis the developers. The "Council of Stellar Management" (CSM), a committee of nine players, is elected every six months, every EVE character having one vote. It provides a formal mechanism for the players to voice their wishes for changes in the game to CCP. Regular meetings between CCP officials and the CSM are held.[11] Normally, very experienced players that are usually associated to one of the big alliances in EVE get elected. However, there are also frequently candidates that claim to represent the views of the non-alliance players in their election campaign.

To conclude: Speaking of virtual organizations, there is a characteristic tension between a relatively high degree of predetermined design on the one hand and spontaneous evolution of new forms of cooperation on the other. There are autonomous player-organizations in MMOs whose importance and potential is largely determined by the game's social architecture, but also political organizations that emerge spontaneously when the community adapts to the needs of the environment. In EVE, a three-layer system of corporations, alliances, and the CSM emerged to ensure and structure political participation within the game as well as on the game.

4 Exemplary findings: a simple online "dictator game"

Let us consider a concrete example of research conducted in a virtual world. The exemplary question – intended to highlight the potential of virtual worlds to produce new insights in areas well-known for being difficult to grasp empirically – shall be: Is there a possibility for altruism to flourish in a Hobbesian natural state? An answer to this question is surely interesting given the importance attributed to phenomena like altruism to overcome conflict situations (Whitt & Wilson, 2007; Coleman & Lopez, 2012). However, laboratory games are generally not complex enough to produce a situation resembling a natural state (Abbink, 2012)[12] and real world evidence on natural states typically has to rely on low quality data sources such as news reports for instance. Whereas it is generally assumed in economic conflict theory that altruism will have a hard time persisting in a natural state (Garfinkel & Skaperdas, 2007, p. 653), this assumption is hardly tested until now.

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[11] More details on the emergence and functioning of this unique organization are presented by Óskarsson (2010).

[12] A notable exception to this rule is the work of Powell and Wilson (2008) who try to set up a Hobbesian jungle in real time. However, the problem comes back in as it is very hard to interpret their findings in a more precise way than Abbink stating that "anarchic environments neither lead to a constant war of all against all nor to a utopia of universal cooperation" (Abbink, 2012, p. 549).

EVE is a particularly suitable environment for doing so. It is considered and desired to be a harsh universe by the player base – and even intentionally designed by the developers to be unforgiving; it is a seemingly anonymous environment guided by rules fostering social conflict. Even though there is in-group cooperation to be witnessed in corporations and alliances, players are always aware of the fact that the trust enabling these organizations may break down at all times. The virtual history of EVE knows many examples of even the most successful corporations breaking down due to betrayal, espionage or infiltration. Thus, while one might draw a *prima facie* distinction between in-group cooperation and out-group hostility, the famous lesson "Trust nobody!" also holds within corps and alliances – albeit to a lesser extent. Based on this idea that EVE is a "corrupted" environment – a virtual representation of a Hobbesian natural state – one self-suggesting hypothesis could simply be: There is no such thing as altruism in EVE because of the adverse circumstances players face.

A good way of testing this hypothesis is to conduct a *dictator game* online. In standard dictator games there is a dictator D – endowed with a sum of money by the experimenter – who can decide how much of his endowment he wants to allocate to a recipient R without R having any means to punish D's behavior. Based on the assumption of rational and self-interested utility-maximizers as players, the game-theoretical prediction for dictator games is that the dictator allocates nothing to the recipient – and supposedly even more so in Hobbesian natural state. *If there is no altruism in the virtual natural state of EVE, one should expect a result close to the game-theoretical prediction, i.e. that all offers concentrate at the single point of nothing being allocated to the recipient.* The first null hypothesis to be tested is that in the online dictator game, the median allocation to the recipient amounts to $m = 0$ ISK (H1).

In real life, it was demonstrated that such a pessimistic hypothesis about the outcome of dictator games has to be rejected across a wide range of experiments (e.g. Bohnet & Frey, 1999a; Forsythe, Horowitz, Savin, & Sefton, 1994; Frohlich & Oppenheimer, 2001; Hoffman, McCabe, Shachat, & Smith, 1994). Fehr and Schmidt (2006, p. 8) summarize the findings: "In experiments, proposers typically dictate allocations that assign the recipient on average between 10 and 25 percent of the surplus, with modal allocations at 50 percent and zero." One has to notice though that these games were not explicitly situated in an environment resembling a natural state. *A second, weaker null hypothesis is that the level of altruism found in the virtual natural state is significantly lower compared to offline games played under regular laboratory conditions.* H2 holds that the median offer in the online dictator game is lower than that for offline games (H_0: $m_{\text{online}} \leq m_{\text{offline}}$). In both cases one might be legitimate in calling EVE (and natural states more generally) a corrupted environment, if the null hypotheses cannot be rejected.

Apart from the claim that EVE is a *corrupted* environment, it is also interesting to ask whether the virtual natural state of EVE is a *corrupting* environment. One might reason that, even if levels of altruism are high for new players, they have to drop significantly after some time as new players have to learn the harsh rules of the game and have to adapt to the new environment in the first place. Another reason for the supposed lower level of money paid back by more experienced players could be that the more altruistic and sympathetic players quit playing EVE altogether as they learn about the harshness of the social interactions in EVE. This is the third hypothesis to be tested (H3): *If the level of altruism found online differs for new and experienced players and if it is lower for the latter, this points into the direction that the virtual natural state of EVE corrupts the high moral standards of players or scares away the "good" players altogether* (H_0: $F_{\text{new}}(x) = F_{\text{old}}(x)$).

4.1 Method

Unfortunately, one cannot simply conduct a dictator game in EVE that would be easily comparable to the ones conducted in real-life laboratories and discussed in the literature. First, because EVE is not a controlled lab environment. It would be difficult to teach the players of EVE the rules of dictator games in detail and in a controlled way before starting to play this game. Second, although it would be theoretically feasible to reproduce the triangular structure of a dictator game (experimenter gives money to dictator who may allocate money to recipient) this would seriously transgress the normal boundaries of play in EVE. The character controlled by the experimenter could give money to the subject's character and ask him to transfer it to yet another character (also controlled by the experimenter without the virtual dictator knowing it) – but by no means would this be a "natural" transaction in EVE. The players would question what is going on and probably adjust their behavior instead of responding with their normal (learned) EVE-appropriate behavior. *That is, by designing the virtual "dictator game" too close to the offline version, the very behavior intended to be observed would be destroyed.* The question is not what the outcome of EVE players playing a standard laboratory dictator game (be it online or offline) would be but whether EVE players exhibit any sort of altruism *while playing* EVE, i.e. *while being* in a virtual natural state.

Therefore, unlike other research which focuses on classic laboratory games played in virtual worlds (Fiedler & Haruvy, 2009; Atlas, 2008; Chesney, Chuah, & Hoffmann, 2007), this paper will rely on an experiment measuring altruism that resembles a classic dictator game and yet stays within the normal gameplay of EVE. This means sacrificing controllability and comparability but creating a "lifelike feel" (Camerer, 2003, p. 63) and conserving the phenomenon to be observed. This also overcomes most of the problems associated with conducting experiments in virtual worlds highlighted by Duffy (2010).

The experiment was set up in the following way: The experimenter's character transfers a sum of 50m ISK to another, randomly chosen player. Only characters that were online at the time of the transaction were considered in order to raise the probability of them noticing the transaction and to allow for interaction between sender and dictator. The monetary transaction is followed up by a short message sent via the in-game mail system:

> "Hi! Sorry, I did not want to give you 50m ISK. It was a mistake. Could you give it back to me please? Thanks! Fly safe."

This was a one-shot communication. No additional messages were sent in order to remind the recipient of the issue. However, if the recipient chose to contact the sender on his behalf, additional communication took place via the built-in text-based chat window. All the recipients could learn about the transferring character was the name, the virtual character portrait, and the age of the character (around 2 years at the time of the experiment).

In general, the recipient of the money gets the impression of accidentally having gained 50m ISK and is asked – kindly, not pitifully, without begging too much – to give it back. The sum of 50m ISK (≈ 2.50 EUR; about the earnings of two hours of work for a decently experienced player) was chosen to be substantial yet not immoderate. *Nota bene*: The virtual dictator who was endowed with the money and who is immediately asked to give it back *cannot be forced* to give the money back with in-game measures. The whole scenario resembles a person accidentally dropping a 20

EUR bill in a bustling pedestrian zone – without her but only the bystanders noticing it.[13]

As it was conducted, the experiment comprised two samples, each consisting of 70 randomly selected online players. However, the first sample only considered players with less than one month of playing experience (the *noob*[14] *group*) whereas the second one did not consider the age of the characters in any respect and was designed to deliver a representative picture of EVE's society (the *normal group*).

The players of the noob group were selected by flying to the twelve solar systems in EVE in which new characters enter the universe for the first time. From the players online in these systems, five (twice) or six (ten times) characters were selected by randomly creating a three letter sequence (e.g. "aig" or "bdu") and then searching for all newly created, online characters whose name contained this sequence. The first character fitting to these criteria was then transferred the money. Then the next character was selected using a new three letter sequence. If no character was found fitting the criteria, a new sequence was generated immediately. *The players of the normal group* were selected in an analog way, only that no attention was paid to the age of the characters or the solar system they were currently located in.

4.2 Findings

The average age of character for the noob group was 12 days, whereas that of the normal group was slightly under two years. From the 70 players of the noob group, 36 transferred back money. 89 per cent of these players gave the money back without asking for *further* explanations from the sender in addition to the one already given in the message – most of them gave the money back without even contacting the sender (64 per cent).[15]

Of the 70 players of the normal group, as many as 43 players transferred back money (98 per cent without asking for further reasons, 77 per cent without any communication with the sender). Figure 3 gives an overview of the amounts paid back.

Insert Fig. 3 Distributions of allocations in the virtual "dictator game", noob group and normal group

Of those who transferred money back, the vast majority of the players paid back the exact same amount they were transferred in the first place. In the noob group, only one player paid back a fraction of the amount (48m ISK) and one even paid back more than he received (55m ISK), apologizing for not having noticed the accidental transfer for so long and thus paying interest (when he had the money for only one

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[13] In EVE, the message from the sender of the money to the recipient is, of course, a proof that the sender actually noticed his mistake, very unlike the pedestrian zone scenario. However, the key function of the EVE-message is not to signal the *conscious* aspect of the action but the *erroneous* aspect. Whereas in real life nobody would doubt that you drop a 20€ bill *unwillingly*, in EVE this could be regarded as a random act of kindness: It happens that experienced players give away money to new players *for no reason* (Guðmundsson, 2010b). Furthermore, the additional message assures that the recipient of the money actually notices that he accidentally gained 50m ISK: Experienced and wealthy players may not keep track of their wallet balance at all time.

[14] In EVE and other video games, inexperienced players are referred to as "noobs".

[15] See appendix B for the complete communication protocols.

day). Within the normal group, three players transferred a fraction of the received amount (twice: 45m ISK; once: 40m ISK). The people paying back a fraction have in common that they reason about a "finder's fee" or "having to pay at least a little bit for one's mistakes" in their replies to the message sent. The mean allocation for the noob group was 51.5 per cent of the endowment (SD = 25.2m ISK); that for the normal group 60.9 per cent of the endowment (SD = 24.3m ISK).

The median dictated amount for the normal group was 50m ISK; a Wilcoxon signed-rank test for one sample with normal approximation leads to the rejection of H1 that the median allocation for the online "dictator game" amounts to $m = 0$ ISK (W = 946, n = 43, z = 5.71, p < 0.01 one-tailed). *There are positive levels of altruism in EVE.* Furthermore, based on a two-sample Kolmogorov-Smirnov test we cannot reject H3 (H$_0$: $F_{noob}(x) = F_{normal}(x)$). There seems to be no difference in the underlying probability distributions of altruism for the noob and the normal group (F_{noob} and F_{normal} respectively) in the sample data (D = 0.100, $n_1 = n_2 = 70$, p = 0.875 two-tailed). Thus, *a fortiori*, more experienced players do not exhibit less altruistic behavior. In fact, the median value for the noob group ($m_{noob} = 49$) even is slightly lower than that of the normal group ($m_{normal} = 50$).

Whereas 87 per cent of the players that did not give the money back did not get in touch with the sender, the "honest finders" tended to reply to the message sent (30 per cent) and give further reasons as to why they are returning the money. In the light of this paper it is particularly interesting that twelve of the 79 players paying back something, state something similar to "be more careful man, most won't return it", "not everyone in EVE would give it back", or "looks like you found the only honest pod pilot in New Eden". That is, they are well aware that EVE is generally a rough environment and would not expect many other players to do the same.

Eleven of the 140 dictators (8 out of the noob group, 3 out of the normal group) stated that they were on *trial accounts*[16] and that they tried to give back the money but found out that the game mechanics will not let them. They promised to give the back the money as soon as they actually bought the game or found another way to transfer the money. These statements, although potentially cheap talk, seem to be rather credible in this specific context. First, the error message that you cannot transfer money from trial accounts (of which two even made a screenshot to convince the sender of their efforts) only appears at the very end of the intended transaction, i.e. when you have already entered the person to whom you want to send the money and the amount. Second, two weeks after the experiment (i.e. when the trial time is definitely over) at least three people stuck to their promise with one buying EVE sooner than he originally intended to. Third, two of the players on trial accounts in vain tried three different methods for giving back the money (direct transfer of money, private trade of goods, via the contract system) and finally found the fourth and only, very complex way, of circumventing the game mechanics (the experimenter setting up a highly overpriced, public market sell order for a cheap item, which is then filled by the dictator). Overall 7 of the 11 players on trial accounts (seemed to) follow up on their promise. To summarize: Those who contacted the sender and promised to pay back seemed to really be committed to doing so.

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[16] Trial accounts for EVE Online are available for free and last for 14 days. Not everything you can do in EVE on a paying account is also possible on trial accounts. For example, you cannot directly transfer money to another player, you cannot trade privately with other players, and you cannot use the contract system.

4.3. Discussion

Based on this simple online "dictator game", the first hypothesis, namely that there is no altruism in the virtual natural state of EVE could be rejected. Overall one cannot only state that roughly every second player gives back the whole amount transferred but also that most players acted kindly and comprehensively in the interaction that followed the transfer.

In addition, the third hypothesis, i.e. that experienced players show a lower level of altruistic behavior as new players, could not supported. The slightly higher willingness to transfer back the money in the normal group could be explained by the fact that 50m ISK mean a lot more to new characters than they do to experienced characters who have an exponentially higher income – the temptation to keep the money thus is higher for the former. Alternatively, one might consider that while money becomes relatively less important over time, reputational concerns matter more (there is more to be lost by acting despicably since more reputation was built up over time), and that this is the reason why more experienced players pay back more.[17] However, these small differences are not significant.

Based on this experiment, one cannot decide whether the level of altruism is significantly lower online than offline, i.e. one cannot reject H2. The modal offers at zero and 100 per cent alone (instead of zero and 50 per cent as usual) and the fact that the mean allocations for the noob and the normal group are a lot higher than in standard dictator games (above 50 per cent compared to 10-25 per cent) are not enough. This is due to the fact that the claim of the tested scenario resembling a dictator game is not unproblematic.

The most obvious difference is the lack of the triangular structure that may cause the dictator to feel less entitled to his endowment (Hoffman et al., 1994). It is not the same *to give money* and *to give money back*. For this very reason, one might suggest that the game played in fact was not a dictator game but rather a *lost wallet game* (Dufwenberg & Gneezy, 2000). A lost wallet game consists of two stages. In the first stage a subject faces the choice to either take or leave a certain endowment granted by the experimenter (i.e. the "content of the last wallet"). If the subject chooses 'take', the game is over. But if the subject chooses 'leave', the second subgame begins, which involves another subject. The second subject (the alleged "owner of the wallet") decides how much money to give back to subject 1 for his honesty in "returning the wallet". The second subgame is structurally equivalent to a dictator game, but one would suspect that the second subjects are under the impression not of dictating an amount of money to *give* to the first subjects, but rather to *giving back* some money in order to reward their honesty. Although the lost wallet is not a perfect equivalent of the online experiment either[18], one might reasonably suggest that it comes closer to virtual participants perception of the situation. Yet, somewhat surprisingly, Dufwenberg and Gneezy find no difference between the amounts *given* in dictator games and the amounts *given back* in lost wallet games (2000, p. 175). Because of their maybe smaller but still existing imperfection in capturing the proceedings of the online experiment, because of the finding that dictator games and lost wallet games lead the same amounts being allocated, and because dictator games are more widely studied in the literature, I choose to stick with my terminology of referring to the online experiment as a virtual "dictator game". One should not forget that for the purpose of this paper it is less important how one classifies the

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[17] Thanks to an anonymous reviewer for suggesting this interpretation.

[18] Most importantly, the first subject does not receive the money directly from the second subject (i.e. from the owner of the wallet) as in the online experiment but from the experimenter.

online experiment as long as one acknowledges that the game is able to capture the existence of altruism.

If it is not for a substantial difference in the underlying structure of the online "dictator game", there still are some ways to account for the unusually high dictated amounts. Bohnet and Frey (1999a) found that interaction between dictator and responder raised the offers in laboratory dictator games and that face-to-face bargaining generally raises offers. If the recipients are allowed to talk with the dictator and to say something about themselves, the mean offer can rise to 50 percent and more than 40 percent of the dictators even allocate more than 50 percent to the recipients. Even if the experiment conducted featured no face-to-face bargaining but contact only via text messages, and even if a high percentage of the dictators do not start communication with the sender, a part of the higher mean allocation found may also be due to effects of identification. One might also interpret the fact that those who paid back something contacted the sender more often than those allocating nothing in this direction.

Secondly, one might also reason that unlike in standard dictator games – in which a 50/50 split is normally considered the "fair" allocation (Bohnet & Frey, 1999b, p. 335) – a different fairness norm applies for the online scenario, inciting the dictator to give back the whole amount. If players really perceived the situation as analogous to a lost wallet scenario, one might very well argue that giving back almost 100% of what was gained is the natural thing to do in real-life, and that this norm might got imported to the virtual world.[19]

Finally, it is well established that higher stakes tend to reduce altruism or fairness considerations (e.g. Slonim & Roth, 1998). And whereas 50m ISK are a considerable sum in the context of EVE, 2.50 EUR might not be enough to elicit the selfish behavior expected.

Besides these three aspects known from laboratory games that make plausible higher than average allocations, there are also additional influence factors due to the virtual environment in which the experiment was conducted – most of them suggesting lower than average allocations than in offline dictator games. Some of them are related to general differences between lab and field behavior (Harrison & List, 2004; Levitt & List, 2007). Table 1 lists these factors that may affect the outcome and that could not be eliminated or controlled for.

Insert Tab. 1 Potential influence factors for the amount paid back in the experiment

All the effects mentioned are limitations to the descriptive power of the experiment conducted. We are not speaking of a perfect counterpart to offline dictator games, as both setups might not measure the same kind of "altruism". There are various reasons why the amount paid back might be higher in EVE but also a lot of valid considerations suggesting lower sums could be given back. One should keep in mind the fact that it is not *lower* levels of online altruism that have to be accounted for but rather *what seems to be higher* levels: A mean allocation three times higher compared to standard dictator games was found. Given the initial second hypothesis that online altruism is significantly lower, this is telling in itself.

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[19] Then however, one would have some trouble explaining Dufwenberg and Gneezy's findings that the results of a lost wallet game resemble those of a dictator game very closely (2000, p. 177).

4.4 Summary

Communication between dictator and recipient and fear of spams, to name just two influence factors, may hinder the direct comparability of offline dictator games and the data from the EVE experiment; but not the general ability of the latter to account for altruistic behavior. *The virtual natural state of EVE is neither a totally corrupted nor a very corrupting environment.* Even such a harsh environment seems to allow for some forms of altruism or kindness, although the players themselves might be surprised as to how many players actually paid back what was given to them. This is even more important since comparable research on altruism in virtual worlds reveals lower values for the online interactions (Spann, Hinz, Hann, & Skiera, 2010; Fiedler & Haruvy, 2009). Even in an environment where conflict-endorsing preferences and violent beliefs are ubiquitous, altruism of the form exhibited in a dictator game may be present.

In view of the scope of this paper and without engaging in a thorough discussion of potential explanations for this behavior here, still some explanations suggest themselves immediately. First, the informal culture of EVE might not be as harsh as officially proclaimed. It might even be the case that players are consciously trying to subvert the established expectations of this environment to further new political realities. Second, players might make a distinction between intentional in-game behavior and inadvertent actions with in-game consequences. If somebody accidentally transfers money in-game because he was distracted by a real life phone call, it might seem appropriate to not judge such an action based solely on in-game rules. Third, it is noteworthy that the altruistic behavior in this one-shot dictator-game-like interactions does *not* seem to be strategic in order to build trust between players. Only two players out of the *noob group* scrutinized in a written interaction that followed the transfer whether a prolonged relationship with the sender of the money might be possible. Thus, players seem to understand the one-shot nature of this virtual dictator game fairly well. Fourth and finally, the most tempting interpretation might be to suggest that what we witness is not genuine natural-state-altruism but rather real-life habits surviving online (although being under pressure). After all, if the loser of a wallet in real-life found a way to contact the finder immediately after losing his wallet, would not we suspect that almost 100% of the finders would return the entire amount? I do have considerable sympathy for this interpretation. EVE does not seem to be the environment where altruism emerges. But I do not think that this interpretation can be proven in this paper which is concerned with the constitutional political economy of virtual worlds and the *existence* of altruism within them – not with potential ways of how altruism might have *emerged* within them. Only the humbler claim that there is something like altruism in EVE can be sustained in the light of the evidence.

5 Conclusion

Using the example of the massively multiplayer online game "EVE Online" as a point of reference, this paper presented the particularities of institutions, beliefs, and organizations that distinguish real world from virtual world constitutional political economy. First, virtual worlds feature a particular kind of formal institution: game mechanics. By modifying the game mechanics the developers can exercise power that goes beyond that of a state enforcing laws by determining the "natural laws" of this environment. Second, the predominant beliefs in virtual worlds are violent beliefs. People expect behavior usually associated with life in a Hobbesian natural state. This is a reasonable attitude given the preferences for violence exhibited by the

community. Finally, virtual organizations are characterized by the predetermined social architecture of the online world. Aspects like the ease and advantageousness of grouping can be modified, as well as the tools used for coordinating common activities. Nevertheless, autonomous political organizations beyond the initially determined boundaries emerge spontaneously.

The main reason why we should care about doing research *on* virtual worlds is the huge potential for research *in* virtual worlds. As an example of this potential, an online "dictator game" was conducted. The findings show that even in the seemingly entirely corrupted online environment of the virtual natural state of EVE, players exhibit altruistic tendencies. Issues of the external validity of these findings surely arise. Nevertheless, given the difficulties of procuring clear and meaningful empirical evidence on violent social conflict, we better avail of this evidence rather than not. Virtual worlds represent a promising complementary way of doing research next to real world field research and laboratory experiments; a way that yields results hardly to be reached otherwise.

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Conflicts of interest

The authors declare that they have no conflict of interest.

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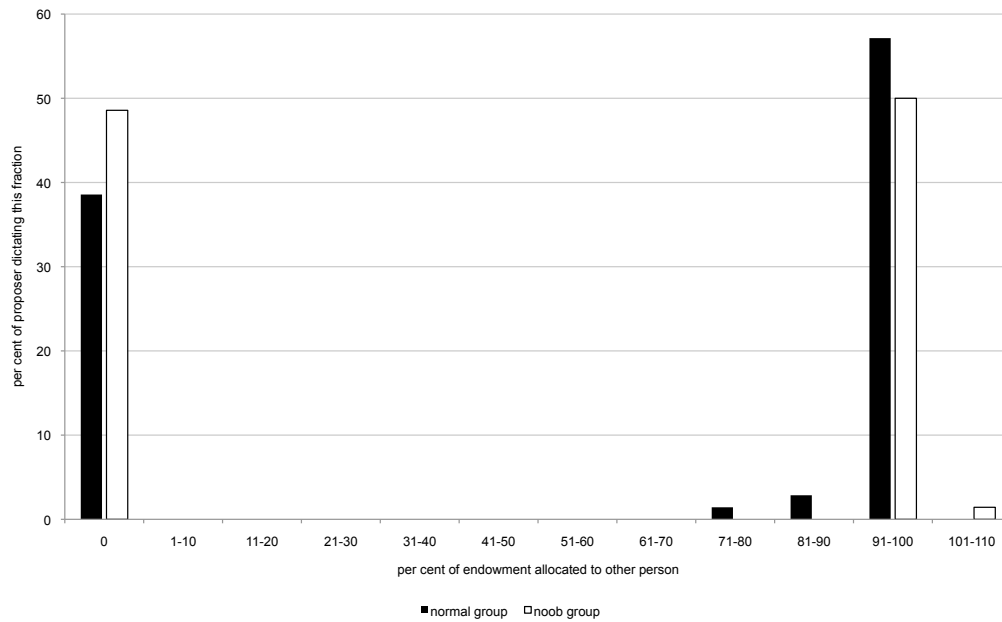
Figures and tables

Fig. 1 Age distribution of the population of EVE at the end of January 2011 from 13 years to 69 years of age (representing 99.8 per cent of the population)
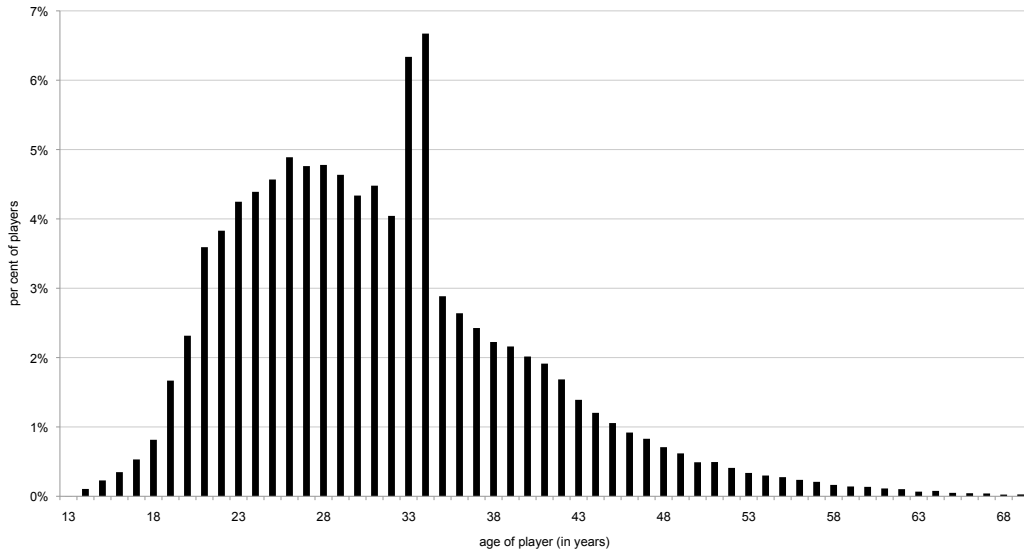
Fig. 2 Where players "live" and where they kill
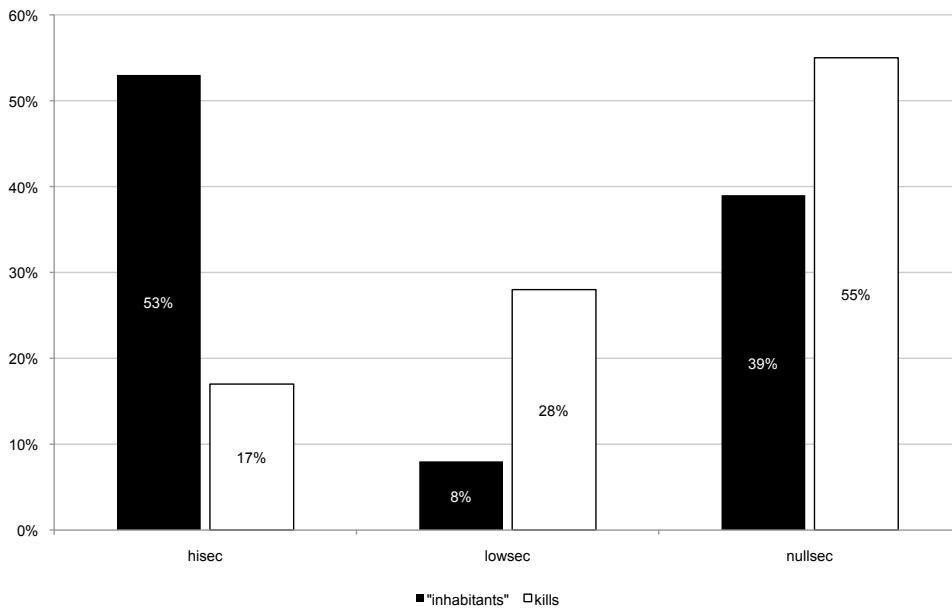
Fig. 3 Distributions of allocations in the virtual dictator game, noob group and normal group

60

50

40

30

20

10

0

per cent of proposer dictating this fraction

0   1-10   11-20   21-30   31-40   41-50   51-60   61-70   71-80   81-90   91-100   101-110

per cent of endowment allocated to other person

■ normal group   □ noob group

Tab. 1 Potential influence factors for the amount paid back in the experiment

Effect	*Description*	*Probably lowering or raising the amount transferred back*
Selection	As EVE is marketed as a "dark and harsh universe", there might be a considerable self-selection bias involved. Generally speaking, one would expect people less likely to be benevolent to play EVE.	Lowering
Pseudonomity	Anonymity is known for lowering the extent of altruistic behavior. Whereas the interaction between subject and experimenter was not entirely anonymous, the pseudonyms used in EVE should lower rather than raise the importance of reputation formation and concerns about the opinions of others.	Lowering
Fear of spams	People asking you for money or trying to trick you out of profit interest ('spammers') are a common thing in EVE. The transaction and the message might be regarded as a spam, for example inducing people to accidentally pay back 500m or something similar. Also corporation or alliance espionage might be possible this way. Some of the players asked the sender directly whether this was a spam.	Lowering
Language	The message was sent in English. Although English is by far the most spoken language in the game, not everybody may understand what happened and what was expected of him. This is also the reason for the rather bad yet supposedly clear English of the message sent.	Lowering
Players on trial accounts	If the randomly chosen player is playing on a free 14-day trial account, he is *technically* not able to transfer the money back aside from very complex transactions. EVE does not allow for money transfers from trial accounts.	Lowering
Inattention and people being offline	Although the message sent should make the recipients notice the transaction, there is no guarantee for this. In addition, the players might go offline immediately after the transaction to return only several weeks later.	Lowering
Pity with noobs	Although the recipient can easily and quickly check for the age of character of the sender (2 years), players may assume that the accidental transfer was the mistake of a very new player and thus be more willing to pay back the money out of pity.	Raising