Experimental design and Hypothesizes

In order to operationalize the Blockchain control mechanism and asses its effects on human relationship, I compare the results of two experimental treatments based on an adjusted Trust game from Berg et al. (1995). I utilize a between – subject design with anonymous participants. The first treatment is a simple Trust game designed by Berg et al. (1995) without the Social History treatment. Two participants are randomly paired and are given a $1 fee after the successful completion of the questionnaire. In addition to this, both participants receive 10 game points at the beginning of the game (1 point equals to 1 US cent). When the game starts the Player 1 (from here: First Mover/FM) makes the decision to either "invest" some or all of his 10 game points by sending it to Player 2 (from here Second Mover/SM) or to leave the game without investing.[1] In case when FM does not invest, the game ends and both players earn $1 and 10 cents. In case the FM decides to invest, the amount send is tripled and sent to the SM. For example, if the FM decides to invest 4 out of 10 game points, the SM will receive 12 points in addition to 10 game points which she already owns. Then, the SM can decide whether she wants to return some, all or none of the received amount back. After the decision is made, participants fulfill a short survey and are informed about their final earnings in US dollars.

In the Blockchain treatment, in addition to the rules of the Trust game treatment, I introduce a notion of a smart contract by informing both participants that if FM decides to invest, the SM would be bounded by the contractual agreement to return at least the amount that was sent before the investment multiplication. For example, if the FM decides to invest 4 game points, the SM receives 12 points of which she is obliged to return a minimum of 4 points or more. This means that the SM cannot decide not to return but she can decide to return more than the minimal amount stated by the contractual rule.

Reciprocity argumentation and hypothesis

As previously noted, key antecedents of trust could be conceptually divided into contextual and intrinsic factors. In the context of one-time, anonymized trust games, I argue that contextual factors such as temporal, social and institutional embeddedness are by design excluded from the trust "equation". Temporal embeddedness is excluded due to the lack of repetition of the game. Social embeddedness is excluded due to the anonymous nature of the

[1] In line with the practice within the literature and for the sake of simplicity, the FM would be regarded using male pronouns and the SM would be regarded using female pronouns.

game and Institutional embeddedness due to the lack of any rules guiding the behavior of both the first and the second mover.

On the other hand, intrinsic traits of the trustee, such as internalized norms, benevolence and an ability to act can be seen as crucial when it comes to trustworthy behavior. Since the players in the anonymized trust game do not know the identity of each other, it is argued that the trustor makes a decision based on his previous experience when trusting others. (Glaeser et al. 2000).[2] Additionally, Berg et al. (1995) content that in repeated trust games, the trustee can behave in a trustworthy manner out of concerns for her reputation or potential punishment threats. Behaving in an untrustworthy manner hinders the trustee's reputation which in turn makes the trustor send less or none of his endowment in the succeeding games (Berg et al. 1995).

Additionally, McCabe et al. (2003) argue for what they call an intention-based model in which a trustee acts according to her own perceived motivations of the trustor. These models emphasize "the role of intentions in achieving cooperative outcomes in personal exchange" and essentially rely "on players reading each other's motives (and not merely their actions)" (McCabe et al. 2003 p. 268). One type of this model is based on the *trust and reciprocity hypothesis*. Two players enter a reciprocal trust relationship if "(1) there are mutual gains from their joint actions, (2) Player 1 takes a risk by trusting Player 2, and (3) Player 2 gives up something in order to reciprocate Player 1's trust" (McCabe et al. 2003 p. 269). Furthermore,

> "Player 1 trusts Player 2 only if Player 1 has two relevant *beliefs*: that Player 2 will interpret his move as a trusting one, and that Player 2 will reciprocate… it is clear that Player 2's action can be described as reciprocal only if she *interprets* Player 1's action as trusting. That is, Player 2 must attribute to Player 1 the *intention* of entering into a reciprocal-trust relationship" (McCabe at al. 2003 p. 269).

In the case of my two experimental treatments I argue that in the Trust game treatment all the contextual factors are omitted by the design of the game. Temporal and

[2] In non-anonymous trust games, Glaeser et al. (2000) suggest, based on their own experimental results, that social connections between the trustor and the trustee and their social capital positively affect the amount sent. On the other hand, a difference in the nationality and race of the participants negatively affects trusting behavior (see pp. 813-14).

social embeddedness are excluded due to the fact that it is an anonymized one-shot game. Likewise, institutional embeddedness is excluded due to the lack of restrictions when it comes to the amount that can be sent and returned by the First and the Second Mover respectively. Moreover, intrinsic factors, such as internalized norms, benevolence and previous experience can affect the decisions of both the First and the Second Mover. Yet, due to the experimental design, these factors are randomly distributed across the participants in the game. Furthermore, the design meets all the necessary requirements for a reciprocal trust relationship. If the FM in the Trust game sends some or all game points to the SM, by tripling the amount sent, the SM has the ability to increase the gains of both players in the game, by sending at least one point more than the initially sent amount before investment multiplication. Due to the fact that SM can abstain from sending any points back, the FM is taking a risky decision to trust the SM. Lastly, if the SM returns something back, she is reciprocating the FM's decision to trust.

In the case of Blockchain treatment, the existence of contractual rules that regulate the behavior of the SM figure as a form of institutional embeddedness. The obligation imposed on the SM to return at least the amount sent by the First Mover is understood here as a regulatory process that makes incompliance with the agreement impossible. Similarly to the Trust game treatment, due to the anonymized one-shot design, temporal and social embeddedness are omitted from the Blockchain game as well. Furthermore, I argue that the possibility for reciprocal behavior in the Blockchain treatment is restricted. If the FM decides to invest and sends some or all of his game points to the SM, he is not making a risky decision since he knows that the SM is obliged to return at least the same amount sent before the investment multiplication. For this reason, the FM has a "flat" preference ordering due to the fact that the minimal amount that he can earn irrespective of his decision is equal to the amount of 1$ fee and 10 cents from 10 initial game points. Yet, I expect that the FM would always invest due to the lack of risk and a possibility that the SM would return more than the minimal amount stated in the contract. Therefore, although the features of the design allow for the possibility for the SM to reciprocate, I argue that she would return the minimal amount not in order to reciprocate the FM but in order to abide to the rules of the contract agreement. The reason for this claim is due to my expectation that the SM will not interpret the move of the FM as a trusting decision. In other words, SM is not interpreting the FM's decision to invest as an intention to enter a reciprocal trust relationship. Thus, I present the following hypothesizes:

1. On average, First Mover in the Blockchain treatment would decide to invest more often than the First Mover in the Trust treatment.
2. On average, First Mover in the Blockchain treatment would invest more points than the First Mover in the Trust treatment.
3. On average, Second Mover in the Blockchain treatment would return a smaller proportion of the investment amount after multiplication than the Second Mover in the Trust treatment.
4. The decision of the Second Mover in the Blockchain treatment would not be affected by the amount sent from the First Mover.
5. The decision of the Second Mover in the Trust treatment would be positively affected by the amount sent from the First Mover.