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MERIT SIGNAL – THE ÉMINENCE GRISE OF ECONOMIC SYSTEMS

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ABSTRACT

A number of economists, including Smith, Veblen, Keynes and others believed that status seeking plays dominant role in motivation to work. Contemporary research supports the notion and finds that people generally desire status not as a means, but as a goal in itself. Evidence further suggests, that the proportion of resources used for status signaling is commensurate with one's income level. Referring to the global phenomenon of volunteering and evidence from fields like anthropology or labor economics, we argue that as equally effective motivators as status can be signals mediated by non-pecuniary awards, like verbal praise, impact indices in the academic domain, or reputation scores on the internet. Based on these observations, we propose a new type of dual work reward, where the motivationally salient psychological signal - the "merit" reward - is separated from the exchange value reward, has its value determined by the market and is granted in a symbolic, non-tradable form. The exchange value reward is commensurate with actual effort, measured in units of labor time. We claim that an economic system with such remuneration mechanism can be both efficiency improving and instituted bottom-up.

KEYWORDS

SDT, merit, signaling, economic system, status, volunteering

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1. PROLOGUE

The "volunteer economy[i]," according to estimates by Salamon et al., (2011) has more than a billion participants globally, who generate over a trillion USD of economic value annually. In spite of its size and the benefits it brings to its participants and consumers, no economic models have to date satisfactorily explained this phenomenon[ii]. Consequently, policy makers, or designers of community economic systems might be missing important insights that could be instrumental to achieving their particular goals. This paper proposes an economic framework, built on a key feature of volunteer economy - the fact that volunteers produce economic value without expecting exchange value reward for their effort.

The paper is organized in the following way. First, we provide an overview of the Self-determination Theory - a modern psychological framework of well-being and motivation. Next, the research results of crowding effects of reward are discussed and the concept of the "merit signal/reward" introduced. Evidence of the merit signal salinity for motivation is then presented, originating in the field of labor economics and the status-related research. In the following chapters, mechanism of the proposed economic system and an experiment testing its basic features are described. A short excursion into the deep history of our species follows and the paper is concluded with comparison of Merit economy to other economic systems.

2. THE PSYCHOLOGY OF MOTIVATION

According to Self-determination theory (SDT) - a psychological model concerning human motivation and behavior - all humans share three innate psychological needs, fulfillment of which strengthen self-motivation and well-being. They are the need for autonomy (self-determination), competence (mastery) and relatedness to other people. SDT also recognizes, that the basic needs are fulfilled through effort driven by motivation, which comes in two forms: intrinsic, defined as the "…propensity of people to take interest in their inner and outer worlds in an attempt to engage, interact, master, and understand…" (Ryan and Deci, 2019, pp 114) and extrinsic that "…concerns all activities aimed at achieving outcomes separable from the behavior itself…" (ibid, pp 120). From the definitions follows that intrinsic motivation will lead to a stronger and more immediate satisfaction of the basic needs than the later. The level of satisfaction of the basic needs associated with extrinsically motivated work is predicted by the theory to depend on the degree to which the activity is internalized, or "integrated" by the worker (Ryan and Deci, 2000).

Since its beginnings in the 1970s (Ryan and Deci, 2019, pp 114), researchers successfully applied the theory to explain effects of various types of reward on motivation and worker productivity in diverse organizational contexts. One of the more notable applications of SDT was providing explanation for a class of phenomena, now well evidenced by a number of studies (Frey and Jegen, 2001, pp 590), where task, or performance-contingent material incentives are found to decrease the level of engagement of intrinsically motivated workers (Deci et al., 1999, pp 628). This "crowding-out" behavioral pattern defies expectation of the standard economic theory, which predicts that workers should increase effort when the supply of reward is increased (Frey and Jegen, 2001). SDT explains the behavior by pointing out that material reward lowers perception of autonomy of the rewarded, who consequently reduce effort (Deci et al., 2017, pp 33). On the other hand, grants of informational positive feedback, like a score indicating worker performance against the average were found increasing - or "crowding-in" - engagement (Deci et al., 1999, pp 629).

Existence of the crowding effects described above suggest that work reward in general can have two functions. The more familiar one allows rewards to be exchanged for goods, or services. Examples include money, precious stones, or equities. The other function is a signaling one, as the character, amount, or the presence of a reward may convey information supporting, or suppressing the recipient's feeling of competence, autonomy or relatedness (Deci et al., 1999). Examples of rewards

endowed predominantly with the signaling function are verbal praise, awards, diplomas, or "likes" and other reputation rating mechanisms on the internet (see for example, stackoverflow, 2019, makeuseof, 2019). If reward is observable publicly, the signal it conveys can affect also the observers, who may respond in a number of ways, including attempting to imitate the behavior that lead to the reward (Henrich and Gil-White, 2001), developing deference/disrespect toward the recipient, or increasing own work effort (Clark et al., 2010). We call this function the "merit signal" of reward. The second inference that can be made from the existence of the crowding phenomena is that for purely intrinsically motivated workers, it is the merit signal of reward that drives motivation to increase engagement level and not its exchange value.

However, as Ryan and Deci (2000, pp 71) point out, "…much of what people do is not, strictly speaking, intrinsically motivated, especially after early childhood when the freedom to be intrinsically motivated is increasingly curtailed by social pressures to do activities that are not interesting…". This reality is reflected also in the standard economic models, which predict that in general, workers do respond to material incentives with greater effort. Yet, not all extrinsically motivated cases are equal, and SDT recognizes a spectrum of extrinsic motivation types that differ in the degree of autonomy afforded to a person. On the lower end, the individuals are the least autonomous and "perceive their behavior as being directly controlled by others, often through rewards and threats" (Deci et al., 2017, pp 21). On the high end of the autonomy spectrum "…people have a full sense that the behavior is an integral part of who they are, that it emanates from their sense of self and is thus self-determined" (Gagné and Deci, 2005, pp 335). Consequently, the most autonomous type of extrinsic motivation is theorized to share many aspects of intrinsic motivation and to deliver also similar effects, including improved well-being and increased work engagement. Implicitly, workers with this type of motivation should respond with more engagement to the merit signal of reward than to its exchange value, similar to the intrinsically motivated ones.

3. MERIT SIGNAL AS A DIRECT MOTIVATOR

One group of workers who respond more to the merit signal than the exchange value of reward are research scientists, who seem to trade better pay for more work autonomy and freedom (Stern, 2004). According to the Nature magazine's annual Satisfaction in science report, 68% of scientists report satisfaction with their carrier, regardless of working longer hours and receiving markedly lower pay than their industry colleagues or other professionals with similar level of education (Woolston, 2018). Lower preference for exchange value of income than its merit signal can be found also among some wealthy entrepreneurs (Loudenback, 2018). For example, Carlos Sims, Warren Buffett, or the late founder of IKEA Ingvar Kamprad (Martin, 2018) are known for their relatively frugal lifestyles, which leaves interest in the merit signaling aspect of reward as the most likely source of their motivation.

Examples of "frugal" billionaires like these might be attributed to individual preferences, but research suggest that the psychological effect of the merit signal of income on motivation is universal. Based on laboratory experiments and analysis of the British Household Panel Survey, DeVoe et al. (2013) found that workers perceive money earned from own labor as more valuable than money gained from other sources like rents or lottery winnings and that money from own labor increases effort to earn even more of it. The authors attribute their findings to the competence signaling aspect of the reward. Another facet of the signaling function of reward is a worker's relative position in income hierarchy. When Walmart raised the company minimum wage in 2015, the long-time employees who have been paid that hourly wage already protested, regardless of the fact that the exchange value of their income has not changed (Pettypiece, 2015). Similar reaction had some workers of Gravity Inc. - a Seattle payment processor - after management raised salaries across the board to USD 70,000 (Hinsliff, 2018). Sensitivity to the psychological signal of relative income had been studied and confirmed also by Clark et al. (2010). The merit signaling aspect of reward for

worker performance was the subject of research by other scholars, resulting in recommendations to organizations to take this function of reward into consideration, when designing incentive programs (Frey, 2007, Stajkovic and Luthans, 2001, Mickel and Barron, 2008).

4. STATUS SEEKING

Regardless of extensive evidence about the merit signal as a direct motivator, there is no doubt that majority of global population work primarily to generate income for its exchange value. Yet, signaling concerns are manifested also in the way people spend their earnings, in particular when these are used to advertise status. The more extreme forms of the behavior were described by Thorstein Veblen (1899), who coined the terms "conspicuous consumption," and "conspicuous leisure," to denote lavish spending on goods and services, or ability to spend time in leisurely activities in order to signal wealth. More recently this subject has been receiving renewed interest from economists as a part of broader shift in the field, directed toward more realism in description of the model economic agent (Akerlof, 1984, pp 3). The focus of these efforts is revision of the agent's utility function, by including "relative" components, reflecting concern for economic situation of others (König and Lausen, 2017, Postlewaite, 1998, Heffetz and Frank, 2010, Clark et al., 2008).

Heffetz and Frank (2010, pp 5) identified three characteristics of status as salient: positionality, desirability and non-tradability. Positionality reflects the universal human propensity to create ranks, based on a variety of parameters, including behavioral styles or personal characteristics. A defining attribute of positionality is that increasing status by one person comes only at the cost to the status of others. The second characteristics of status is its desirability, with two possible candidates for its source (ibid, pp 8):

- people might seek status as a tool for acquiring goods and services,
- status might be desired for its competence signaling function.

While both reasons are likely, and in many cases occur at the same time, the fundamentality of the SDT-identified basic needs and their "non-material" character dictate that eventually - even under the scenario A - most resources acquired will be ultimately used to address a person's psychological needs. Propensity of people to use own resources to gain status is a widespread phenomenon (for example Swedroe, 2019) and was also studied and confirmed experimentally (Huberman et al., 2004, Ball et al., 2001). Huberman et al. (ibid) also found the source of desire for status to fit the signaling (B) option. Signaling concerns emerge as the most plausible source of status desirability also from the orthodox economic model modified by a utility function with status-indicating relative arguments.

> "…with a utility function that has both a (standard) absolute and a relative consumption components and is — as is standardly assumed — concave in absolute consumption, the marginal utility from additional consumption through the absolute term approaches zero as income rises. The relative component hence becomes increasingly important as income rises. Status seeking, on this view, becomes increasingly important with economic growth… (Heffetz and Frank 2010, pp 26)"

As the quote above implies, the higher a person is on the income ladder, the greater portion of her income should be invested into status signaling. A study of spending habits of 480 American households using data from Consumer Expenditure Survey found that visible goods - a proxy for status-broadcasting positional goods (Hirsch, 2005) - are indeed consumed predominantly by the wealthy (Heffetz, 2007, pp 18). The economic impact of status-seeking can be illustrated on charitable giving - a category of expenditures, dominated by grants from the wealthy (Auten et al., 1997). This activity - also called "conspicuous compassion" (West, 2004) - contributed $410.02

billion in 2017 (2.1% of GDP) to US charitable organizations and has been growing on average by $8.94 billion for the past 40 years ("Giving Statistics," 2018).

5. THE HYPOTHESIS

In the preceding paragraphs we discussed the most significant areas of research, concerning psychological effects of reward on supply of labor, in diverse situations and organizational contexts. Next, we will proceed to confront the evidence and arguments presented so far, with the founding theses of this paper:

1. A work reward in general, has two functions:
    a. conveys information about a person's competence and relatability to others. This is the merit signal of reward,
    b. provides means that can be exchanged for goods and services. This is the exchange value of reward.
2. Once a person's physiological needs are addressed, maximizing the merit signal plays dominant role in their motivation. The motivation is direct, when work effort is driven by the size or presence of the merit signal of reward, or indirect, when work effort is driven by desire to acquire the exchange value to be used as an instrument for boosting status - a form of merit signal.

Based on the extensive evidence from research into the "crowding phenomena," for people intrinsically motivated, both of our theses are true. Intrinsically motivated person chooses to engage in activity, because the act fulfills her need for autonomy, competence, or relatedness. She welcomes a merit reward, if it signals her competence and will also accept reward that can be exchanged for goods and services, if its grant does not interfere with her feeling of autonomy. Extrinsically motivated individuals may behave in a way similar to the one typical for intrinsically motivated ones, if they perceive the activity they perform as highly autonomous. To a great degree, they respond with greater effort to the merit signal than to the exchange value of the reward. As we slide on the autonomy scale down, the directly experienced merit signal of reward as a source of motivation is weakening and the exchange value of reward as a motivator becomes dominant. The exchange value of reward is used to address initially the individual's physiological needs, until a point is reached, when these are mostly satiated. The extensive status-related literature informs us, that with income increasing, a large portion of it is used to improve one's social status. In effect, that portion of income is transformed into merit signal through purchase of positional goods. The second founding thesis therefore still holds also for the extrinsically motivated workers, to a degree that is determined by the portion of income used for merit signaling. The size of that portion of income is unknown, albeit the cited research (Heffetz, 2007, pp 18), as well as a qualitative model with utility function containing relative arguments for status suggests that status signaling is the dominant concern for the highest income workers (Heffetz and Frank 2010, pp 26).

Several researchers pointed out that status seeking through conspicuous consumption generates economic inefficiency and negative externalities that leave everybody worse off (König and Lausen, 2017, Heffetz and Frank, 2010). The situation was illustratively described in a paper by Hopkins and Kornienko (2004) in the following way:

> "…everyone increases conspicuous consumption in order to improve status, but any gain in status is cancelled out by the similarly increased expenditure of others. Such an economy can be described as a Lewis Carroll "Red Queen" economy, in which "it takes all the running you can do to keep in the same place…."

Status seeking is therefore a zero-sum game, similar to Prisoner's Dilemma, where defection of a player results in an inefficient equilibrium (goods or services are over-consumed). Consequently, Heffetz and Frank (2010, pp 7) suggest that a theoretical possibility exists for Pareto improvement.

A number of policies was proposed, including public provision of private goods (Koenig-Robert and Pearson, 2019) or imposing tax on positional consumption (Layard, 2006, Frank, 1985, Boskin and Sheshinski, 1978). However, if the founding theses of our proposal are valid, any redistribution attempts of already earned reward will be necessarily seen as lowering one's merit signal and therefore resisted. A more navigable path for resolving the described inefficiencies could be to minimize the opportunity for individuals to use resources to acquire status. This can be accomplished by instituting an economic system (the "System", or "Merit economy"), with the following basic functions:

1. the System rewards every hour of labor time of any agent with equal amount of exchange value (the Currency) and does so before the market value of the labor output is determined,
2. agents can sell their labor, or its product, for any amount of their choosing that market can bear,
3. buyers make payments for labor or the purchased goods and services to the System, not the seller,
4. the System assigns to the seller a non-transferable score, equal in size to the sale price. This is the motivationally salient merit signal portion of the seller's reward,
5. the System destroys the Currency received from the buyer,
6. the Currency held by the agents can be exchanged for national currencies at market-determined rates.

The System is envisioned to be implemented as a computer algorithm, where both functions of reward - the Currency, carrying the exchange value, as well as the merit signaling score - exist in digital form only. The most important feature of the proposal is that the exchange value is granted separately from the merit signal of reward. This allows virtually equal distribution of exchange value among the economy actors, while the merit signal of reward is determined by the market and as such is granted unequally. As a consequence, accumulation of excessive exchange value by individuals is severely constrained and therefore its use for status signaling is significantly suppressed. At the same time, the competitive environment and market-determined prices, typical for a market economy are maintained in the System.

6. EXPERIMENTAL EVIDENCE

During the winter season of 2017-18, an experiment was performed on an outdoors recreation web site (cross-country skiing), to make qualitative evaluation of the main tenets of the System. The site receives around 40 000 visitors per season and the most popular crowdsourced section of the site is typically produced by around 150 users. Before and after the experiment, the site content was accessible to all visitors, without pay. During the experiment, the content creators were given the choice to lock their new post and make it accessible only by paying points. A flat points reward was granted to the content creators for posting and points could be also purchased with euros. This arrangement ensured that the content creators had enough points to read other contributors' posts, while the non-contributors faced a choice to start contributing in order to earn points, or to purchase them if they wanted to consume the locked content. Two types of non-monetary rewards had always existed in the site in the form of star rating the consumers could assign to the individual content, and a number was also visible on individual posts, indicating the number of reads. The effect of these arrangements was, that during the experimental season, the number of contributors doubled (from 150 to 300), the frequent contributors who provided content in the preceding and following seasons continued to participate, and 130 users spent close to 600 euros purchasing points. The number of registered users also doubled to around 1 200. The following season, after the site returned to the non-experimental state, the number of posts, visitors and registered users also returned to the pre-experiment levels.

The results suggest that introduction of "money" (points) into the site did not suppress intrinsic motivation of the "old time" contributors, confirming the SDT predictions. Instead, the locked content motivated a new group of contributors, who were consumers-only before and after the end of the experimental season. Additionally, the new currency naturally gained an exchange rate against the national currency. As a reaction to the experiment results, an actual implementation of Merit economy called NEO is being developed, that implements and extends the rules of Merit economy. The economic engine is available for use also in third-party projects (Zatko, 2018).

7. EVIDENCE FROM OUR PAST - THE HUNTER-GATHERERS

A potentially more substantial confirmation of the notion that a long-term stable implementation of the System is viable can be found in our history, in the socio-economic arrangement of hunter-gatherers that governed lives of hominids and modern humans for most of the past two million years (Hawkes et al., 2018, Lee and Daly, 2002, Hayden, 2001). These people lived in small, strictly egalitarian bands of around 30 people and everything they had, including food, tools and other property was shared equally (Marlowe, 2005). The resource sharing and the egalitarian character behavioral pattens attracted considerable attention from researchers, as they defy expectations of the standard economic model and represent a discontinuity in the evolution of our species' social arrangements (Pennisi, 2014, pp 824). A comprehensive account of the later characteristics can be found in the study by Boehm, (1993) who argues that social equality was achieved by a process called reverse dominance hierarchy, where the "leaders" are controlled by the group members. According to the author, the process is rooted in an individual's dislike of being dominated - a manifestation of our basic need for autonomy. The natural differences in preferences for domination and other features that typically lead to creation of hierarchies, were suppressed by "intentional leveling" - a mechanism which includes criticism, ridicule, leaving, disobedience, or execution (ibid, pp 228).

The resource sharing behavioral pattern is most apparent in the way food is acquired and distributed among the band members and as a result, management of this resource attracted the most attention from researchers. Schematically, the pattern can be described in the following way: in a band of hunter-gatherers, small animals and starchy foods like tubers or fruit are supplied by women, whereas men provide more valuable food resources like wild honey or meat of larger animals. Once collected, the food is brought to a central place - typically the camp - where it is portioned and distributed to the band members. The feature of the pattern most surprising to a western observer is that the most productive food providers do not receive the largest shares and usually are not even the ones who perform the portioning, or distribution. At the first sight, this scheme seems to violate one of the basic principles guiding social cohesion, that acts of giving must be at some point reciprocated (Gouldner, 1960). To explain this paradox, a number of hypotheses were put forward, which can be synthesized into four most important ones: kin selection, tolerated scrounging, reciprocal altruism, and costly signaling (Gurven, 2004). The first two concern primarily the question of who gets how much and why, whereas the third and fourth provide explanations for why exceptional producers exert a seemingly unreciprocated effort. The reciprocal altruism hypothesis was found inadequate to explain the asymmetry in sharing, as it is unable to explain the fact that often the exceptional hunters' productivity is not possible to reciprocate in kind (Winterhalder, 2001, pp 9). The costly signaling hypothesis, first formulated by Hawkes et al. (1993) explains the paradox by balancing the asymmetric flow of food toward the group provided by the hunter by a counterflow of social attention and mating benefits he receives in return. While objections were brought up against significance of the biological fitness-related benefits (Gurven and Hill, 2007), presence of the attention and reputation-related benefits is finding more support (Stibbard-Hawkes, 2019). A very likely source of the hunter's motivation is the feeling of competence he experiences after a successful hunt. After all, hunting is practiced also today, because it is often perceived by the hunters as thrilling (Daigle et al., 2002, pp 11). Gurven (2004, pp 254) reports that women-foragers overproduced as well, only to give the surplus away. This behavior can be explained within the framework of the

reciprocal altruism hypothesis, but can also be seen as an activity directed toward addressing the psychological need for relatedness (Lawler et al., 1995).

The pattern of food sharing among hunter-gatherers illustrates that an economic system can persist for long time period even if resources are distributed equally, if a mechanism exists that balances the one-directional flow from the overproducer to the group by a counterflow of benefits flowing in the opposite direction. The benefits do not have to be in-kind; they can instead address some of the higher echelons of the individual's hierarchy of needs (Maslow, 1954).

For reasons that remain disputed (Hayden, 2001, Arnold, 1996, Paynter, 1989), the system started to break down some 15,000 years ago, when humans begun to create permanent settlements. A plausible scenario how the process might have unfolded was suggested by Hayden (2001), who places the transformation into physical locations, rich with natural resources. Abundance of food freed people to devote time to activities other than food production, like creation of art and invention of new technologies. However, a negative side-effect of these developments was that the environmental pressures responsible for existence of the social leveling mechanism that kept opportunistic individuals from dominating, disappeared as well. Consequently, the opportunists started to accumulate resources (food, land, domestic animals…) and used them to acquire objects signaling status - the "prestige items". These were in turn used for brokering social relationships, controlling others through indebtedness or for acquiring other desirable items and services (ibid, pp 255). The coveted honest signals of competence and prestige that before were communicated by verbal praise and non-verbal clues, are now attached to physical objects like the prestige items and later positional goods and money. Increasing one's status thus became possible by simply accumulating material objects. However, by transferring ownership of the object away from its creator, the character of the signal is changing; it no longer signifies the effort, skill or talent of the creator, instead it conveys only the new owner's ability to marshal resources[iii]. The consequences are twofold:

a. social learners (Henrich and Gil-White, 2001) - instinctively reacting to the status signal as a marker of evolutionary beneficial behaviors - are learning a skill that again only perpetuates the quest for status. In effect, effort is directed away from addressing deficiencies in fulfillment of one's fundamental needs for autonomy, competence or relatedness, toward more often than not, wasteful goals (see the "Red queen effect" mentioned earlier),
b. the resources accumulated by the status seeking individuals create artificial scarcity and lead to economic inequality.

8. MERIT ECONOMY AND OTHER ECONOMIC SYSTEMS COMPARED

8.1 Capitalist market economy

In this system, the amount of money – the most common type of work reward – is a measure of its exchange value, but serves also as a merit signal. As argued above, the exchange value of money is commonly used to gain status – a form of merit signal. The two functions of reward are thus inseparably bound in the monetary reward, with the consequence that even workers who would supply labor for just the merit reward, receive exchange value reward as well. If we further consider that for-innovation-important personal characteristics and luck are scarce within population, only a small group of people ends up attracting most exchange value available in the economy. These inequalities are multiplied by other factors (Piketty and Goldhammer, 2014), ultimately resulting in unfair[iv] and destabilizing distribution of exchange value.

The second major problem of capitalist market system is its inability to supply optimal amount of money into the economy, as evidenced by the periodic occurrences of financial crises. This occurs regardless of the existence of a diversity of institutional arrangements and mechanisms, designed to thwart such events.

The Merit economy solves the first problem by separating the exchange value of reward from its merit signal. In particular, the exchange value reward is granted for effort, measured in units of labor time and is thus independent of (orthogonal to) the market value of the created good or service. By virtue of the majority of people working similarly long work days, this guarantees virtual equality in income. The income equality in turn also ensures impossibility to purchase status, as it can emerge only when material differences exist between individuals. At the same time, motivation of workers in Merit economy to supply labor should be at least as strong as in the capitalist market economy, as the merit reward received for selling one's output is market determined.

The second problem of the capitalist market economy is addressed in the Merit economy by implementing an endogenous money creation and destruction mechanism. Whenever a worker reports labor, a fixed number of monetary units is created by the system, commensurate with the number of hours worked. The money is rewarded to the worker once their report gets verified by a group of system-selected verifiers. The money does not circulate, instead it is destroyed (converted to the merit signal reward respectively), whenever its holder makes a purchase. These arrangements, together with transparency provided by the system (actors can see all balances and transaction details of other actors), should be sufficient to maintain balance between money creation and destruction, without the need for external regulation.

8.2 Time Banking systems

In Time banking systems, money has typically the form of credit, issued by the seller/producer of a product or service to the consumer. This contrasts with money creation in the Merit economy, where the money is not a form of credit, but a reward for work already performed. As such, Merit economy can be implemented without the necessity to exogenously set any credit levels. Another difference between Time banking and Merit economy is, that the currency of the former lacks the merit signal (for example, a heart surgeon receives the same monetary reward for an hour of work as a gardener for cutting grass). This is also the most likely cause of problems with scaling Time banking projects beyond a relatively small number of participants and generally the reason for the short life span of such initiatives (see for example Shih et al., 2015).

8.3 Mutual credit systems

Merit economy offers several advantages when compared to mutual credit systems (MCS). First, money in the MCSs "bundle" the merit signal together with exchange value, similar to the capitalist economic system. On the one hand, this is an advantage against Time banking, as reflected in the longevity and other parameters of real-world MCS projects. At the same time however, as argued above, this bundling is the primary cause of emergence of income inequality. The second disadvantage of MCSs is the very mechanism of money creation. Issuing credit requires trust, which necessitates maintenance and occasional defection costs that need to be carried by the economy participants. Lastly, only marketable work can typically back credit issuance in MCS, implying that the economy does not offer a way to “naturally” set monetary rewards for non-marketable activities, like science or art creation, as these typically do not have immediate market value.

8.4 Cryptocurrencies

The Merit economy carries some similarities with cryptocurrencies (CC), like Bitcoin. Both are digital-only, trustless systems, that "mint" exchange value endogenously, relying on the proof of work

in the CC, and proof of labor in the Merit economy cases. One difference is that in the former the work is wasteful, whereas in the later it is intended to be useful. Another difference is that tokens (the money in CCs) are not removed from circulation and there is generally an arbitrary, algorithmically set upper limit of tokens that is possible to ever mint in the system. The CC token market value must therefore be derived artificially by some ad-hoc mechanism, or by financial markets from scarcity programmed into the token creation mechanism.

9. SUMMARY

The main argument of this paper is that work reward in general can not only be exchanged for goods and services (has exchange value), but also provides - directly or indirectly - information about the recipient's social status, or their personal characteristics like competence and relatability (the merit signal). We claim that the later function is the source of motivation to supply labor, and consequently - by virtue of being tied to the exchange value of reward - also the source of economic inequality in the capitalist system. Salinity of the merit signal for motivation to supply labor is predicated by the founding tenets of the self-determination theory (SDT), according to which people instinctively seek fulfillment of their psychological needs for autonomy, competence and relatedness and that this instinct drives their motivation. An implication of the theory is that once a person fulfills her basic physiological needs, she uses the available resources for increasing her status, or fulfilling her higher-level psychological needs identified by the SDT. The presented arguments are confronted with experimental, theoretical and real-world evidence, originating in a diversity of sources:

- the psychological literature concerning crowding phenomena,
- the economic research about status seeking,
- own experiment,
- research results from anthropology, concerning the economic arrangement of hunter-gatherers.

Based on the presented arguments, we propose that an economic system ("Merit economy"), with a specially designed dual reward mechanism can be instituted that eliminates certain inefficiencies of the mainstream economic system. The first of the two rewards carries the motivationally salient, non-tradable merit signal in the form of numeric score, equal to the market-determined price of a worker's labor, or of the product produced. The reward is a reflection of the worker's competence and skills, similar to the numerical metrics used to measure impact of scientific output (Pan and Fortunato, 2015), or to the reputation-like scores, users can earn on various internet platforms (see for example, stackoverflow, 2019, makeuseof, 2019). The second reward is commensurate with the number of hours worked and is granted before the price of the labor or its output is known (determined by the market). Given that there are 24 hours in a day, the daily income an individual can earn has an upper limit and consequently the possibility to use income as a status signal greatly is suppressed. Thus, the economy constantly distributes the economic product virtually equally, while maintaining the dynamic character of a market economy.

The set of benefits an economic system with the described dual reward mechanism can deliver, depends on the choice of additional functions that complete the ones described in the paper. For example, the instance of Merit economy called Neo (Zatko, 2017) does not specify any built-in constrains on what activities are "work" and therefore any actually performed activity that can be purchased/rewarded within the economy can receive both types of reward. This choice extends the benefit of the virtually equal distribution of economic product by granting agents a total freedom in choosing the activity, they might want to engage in. This is a necessary condition for fulfilling the SDT-identified basic human need for autonomy, as well as for a person to feel intrinsically motivated - the highest and most powerful form of human motivation. The focus of our proposal on delivering economic system that addresses the fundamental human desire for self-determination should bring

other benefits that will become clear over time - if real-world implementations confirm viability of the arguments expressed in the paper.

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Endnotes

[i] Whenever mentioning volunteers, we mean all types of public goods providers, including Free and Open Source Software developers, or participants on crowdsourced projects like Wikipedia ("Wikipedia," n.d.), OpenStreetMap ("OpenStreetMap," n.d.) and others.

[ii] A sizable body of research exists concerning volunteering, including works that claim to explain particular types of volunteering, within the conceptual framework of neoclassical economics (see for example Lerner and Tirole, 2003, Katz and Rosenberg, 2005).

[iii] The situation has an analogy in the role of neurotransmitters like dopamine or endorphine in the brain. They are normally released as a reward for evolutionary beneficial activity like exercise, but it can also be elevated artificially, by using psychotropic substances (NIDA, 2017).

[iv] "Fair" understood here in terms of the Rawls' difference principle (Rawls, 1999)