Theory of Intersubjective Perception of Value of Money

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In my several previous works on money matters (here, here, here, and here), I drew attention to the logical and consequently deductive problems of the Austrian Economic School in the monetary field. In other works I have proved that gold became money because it best reflected the interest rate, or in other words with gold humans were able reduced the spread of debt exchange. Narrowing of the spread of debt exchange is, however, a response to why gold and not water became money, or why Bitcoin cannot be money. But the argument of a narrower spread does not explain why a certain good is actually considered money. Therefore, this work is aimed at proving such fact.

1. Defining the Problem: Mises’s Explanation of the Purchasing Power of Money

In economic terms, it is necessary to clarify why money has purchasing power. In the case of other goods, we explain their utility on the basis of so-called use value; man assigns use value to economic good based on the subjective appreciation how economic good is suitable to fulfil his need. In all other goods, except for money, we can “live” theoretically with this. However, money has only exchange value; there is no use value in the same sense as we assign it to other goods. We use money only for exchange and exchange itself is its utility; Mises call this that money subjective use value coincides with subjective exchange value. But money has its objective exchange value. And explaining that money has its purchasing power because it has their objective exchange value is arguing in the circle (the so-called petitio principii error). Mises was aware of the problem, as he writes (bold type was added):

By “the objective exchange value of money” we are accordingly to understand the possibility of obtaining a certain quantity of other economic goods in exchange for a given quantity of money; and by “the price of money” this actual quantity of other goods. It is possible to express the exchange value of a unit of money in units of any other commodity and speak of the commodity price of money; ... In the theory of the value of commodities it is not necessary at first to pay any attention to objective exchange value. In this theory, all phenomena of value and price determination can be explained with subjective use-value as the starting point. It is otherwise in the theory of the value of money; for since money, in contrast to other goods, can fulfil its economic function only if it possesses objective exchange value, an investigation into its subjective value demands an investigation first into this objective exchange value.

The problem of arguing in circles arises from the fact that it looks like money in Austrian approach is a special class of economic good demand for which is not derived from the way it is placed by the human subjects on their preference scale, but from the fact it has its universal purchasing power, i.e. it is universally exchangeable, ipso facto, it is its price as such, expressed in other goods, which determines demand for it, based on which it is placed by human subjects.

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1 Mises, L. The Theory of Money and Credit. Section II.7.11-12 WWW DOCUMENT <http://www.econlib.org/library/Mises/msT3.html>
on their preference scale. We derive prices of all other goods from how we demand them in the context of satisfying some of our needs. However, the classic perception of money is that we only want them in order to exchange them for goods that meet our needs. With reference to Mises, Rothbard writes about the fact as follows (bold type was added):

“To put it in another way: without a price, or an objective exchange-value, any other good would be snapped up as a welcome free gift; but money, without a price, would not be used at all, since its entire use consists in its command of other goods on the market. The sole use of money is to be exchange for goods, and if it had no price and therefore no exchange-value, it could not be exchanged and would no longer be used.”

The problem of this explanation of the objective exchange value of money in the same way as it is explained for other products is also due to the fact that money is not consumed, thereby their subjective use and exchange value coincides and is expressed in objective exchange value.

It is accepted among Austrians that Mises solved this problem by applying the so-called regression theorem³. It must be stated (see also my detailed Critique of Regression Theorem) that Mises did not solve this problem by his regression theorem. His argumentation continues to be either arguing in circles or it must be stated that it objectifies the economic good of money in terms of value. Given that he did not admit arguing in circles, his explanation of attributing the objective exchange value of money remains based on objectivism.

Some of the discussions about the topic I have sporadically joined suggest that it is more difficult for some colleagues to identify this problem I explicitly see and where, in relation to Mises and his followers, I even point to the use of objectivism⁴. For better explanation refer to the text of Ján Mašek. Using the text, we can first see what Mises explicitly claim and then prove Misesians’ mistakes. Mašek pithily and comprehensively writes about the whole issue as follows (the bold text was added, please read carefully)⁵:

“The value of any good can be divided into a use value and an exchange value. The value is then objective or subjective. .... The objective use value lies in what a thing can be objectively used for. Pork from a pig can be used to prepare white pudding (“jitrnice”) sausage, seeds can be objectively used to grow strawberries. ... The subjective use value then lies in the extent to which a man appreciates the objective value of that thing. For a meat lover, a pig will probably have a higher use value than the seeds; and for a vegetarian, it will be on the contrary. The objective exchange value is derived from the fact that the thing can be exchanged. On the market, a pig can be exchanged for many kilograms of seeds.

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³ For a brief explanation, see e.g. Murphy, R.P.: *The Origin of Money and Its Value*. WWW DOCUMENT <https://mises.org/library/origin-money-and-its-value>

⁴ It is similarly true that an invalid premise subsequently causes a disruption of the entire deduction system of the Austrian School related to the theory of money, banking and the business cycle.

The objective exchange value is also called purchasing power. The subjective exchange value is dependent on how a man can estimate the objective exchange value. The entire value scale is then affected by the subjective use value together with the subjective exchange value. ... For all goods except for money, the subjective use value in economy is given externally and we do not further analyse it. It is such as it is. Money, however, has neither objective nor subjective use value; it only has an objective and subjective exchange value (if we abstract away from using the commodity of money for non-monetary purposes, such as gold in electronics). Explaining the objective use value of, for example, wheat is a task for natural sciences. The subjective use value of non-monetary goods can be explained by psychology. The objective as well as subjective exchange value of all goods is explicated by economics, but in the case of non-monetary goods, it ultimately derives it from the use value. But as we have already said, money has no use value, and from a man’s perspective, money has only a subjective exchange value. ... We can explain the fact by way of an example: a farmer Alois sells ten litres of his milk for 100 crowns. The standard theory of value implies that this is because Alois assigns a higher rank to 100 crowns than to 10 litres of milk on his value scale. This also applies to money, but we cannot stop here. Why does he assign 100 crowns a higher rank when he cannot eat or otherwise consume it? Let us suppose that the situation on the market is such that he can exchange 100 crowns for a hen which is assigned a higher rank on his value scale than the last 10 litres of milk. Or the objective exchange value of 100 crowns is such that they can be used to acquire a hen. But how does Alois know that he can get a hen for 100 crowns? ... Alois assigns a subjective exchange value to a hundred crown note because he knows that its objective exchange value is the capacity to acquire a hen. Here, however, we seem to be moving in a circle. The objective exchange value (Alois trades milk for money) depends on the subjective exchange value, and vice versa, the subjective exchange value depends on the objective exchange value (100 crowns enable acquisition of a hen). It seems that the purchasing power of money (the objective exchange value) is explained by a reference to the purchasing power of money. ... But Mises came up with a solution to this problem. The evaluation takes place at different times. ... Or more specifically, today’s purchasing power (today’s objective exchange value) depends on the expectation of future purchasing power (subjective exchange value), which in turn depends on the purchasing power observed in the past (past objective exchange value). But that poses another problem: if today’s purchasing power depends on yesterday’s, which in turn depends on the purchasing power from the day before yesterday, where will it stop? Is it not endless regression? Mises, however, came to the conclusion that regression is not infinite as it stops at the moment when the commodity of money was first used in the indirect exchange.”

Thus, we assign a use value and an exchange value to the goods. A good, such as salt, gold, fur, livestock, has objectively – by nature – certain chemical and physical properties that are reflected by a humans, and based on such reflection (insights, findings, discoveries of what to
use the good for), the human subject assigns a rank to such goods on his value scale, depending on how a particular good satisfies his subjectively perceived needs (use value). Exchangeability of goods (exchange value) is to be derived from whether the goods, based on their properties given by nature (use value), can meet the needs of others. Money, however, is a good that needs to be approached differently. We explicitly assign no use value to money in contrast to other commodities. We have money for the only purpose of exchanging it for other goods. We should keep in mind that the objective exchange capacity of all other goods is derived from how human subjects prefer them inversely on the basis of their understood objective properties. But in the case of money, the objective exchange capacity is derived from the previous exchange capacity. Until when? According to the regression theorem, up to the point when people preferred the good on the basis of its understood objective characteristics (use value). But in a few foregoing sentences, Misesians claim that we do not derive the exchange capacity of money from the use value. By regression, Mises only “delayed” solving the problem, more specifically he does not clarify why the time perspective of regression should change the explanation of the purchasing power of money from its use value in the very past. In any event, we are ultimately getting into a logical contradiction. Either money is attributed its exchange capacity at some time in the past based on a use value of the good they were before they became money, or such capacity is not assigned to it because it is money. Both options are not possible. This argument can also be supported by Menger’s explanation of what we should understand “use value and exchange value” to mean and how we should perceive them. Menger writes about the topic (bold type was added):

It is certain, then, that numerous cases can be observed in the economic life of men in which economic goods have use value and exchange value simultaneously to the economizing individuals possessing them, and that the two forms of value are often of different magnitudes. The question that arises is which of these two magnitudes is, in any given case, the one that determines the economic calculations and actions of men—or, in other words, which of the two forms of value is the economic form of value in the given instance. The solution to this question arises from reflection upon the nature of human economy and upon the nature of value. The leading idea in all the economic activity of men is the fullest possible satisfaction of their needs. If more important satisfactions of an economizing individual are assured by the direct use of a good than by its indirect use, it follows that more important needs of the individual would remain unsatisfied if he were to employ the good in an indirect fashion for the satisfaction of his needs than if he were to employ it directly. There can be no doubt that in this case the use value of the good will be determining in the economic calculations and actions of the economizing individual concerned, and that in the reverse case it will be the exchange value.”

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As we can see, Menger, in the first part of the citation, gives the impression that for a man, a good has both use value and exchange value simultaneously. But in the next part of the quoted text, Menger is explicit enough to make us reject his approach. He clearly distinguishes between the evaluation of goods based on *use value* and the one based on *exchange value*. It should not be confusing for us if, for example, I own apples because I eat them, but also due to the fact that I exchange them, that I assign both use value and exchange value to them at the same time. No. This means that I also perceive their potential use value as well as their potential exchange value in time, and it will depend on the circumstances to occur, which one will be assigned to them at a particular moment. They will never be assigned the value at once. Therefore, at the decisive point of regression, we have nothing to be derived from anything. *Use value* and *exchange value* are two ways of satisfying the needs perceived by the human subject – direct (*use value*) and indirect (*exchange value*).

Mises and his followers are not aware of the problem associated with the regression theorem. Therefore, we have no other choice but to declare that money objectifies. They rely on the premise that money has no use value. By the premise, they argue that the exchangeability of money is not derived from how human subjects assign to it use value which, for other goods we exchange, is derived from their properties given by nature. The question is how does money acquire its exchange value? Mises argues that based on the anticipation of its exchange value. How can it be explained? In two ways. The first is that we anticipate the exchange value, for example, based on our belief in the exchange value of the good. The problem is that it is *petitio principi error*. Because the argument of anticipation necessarily implies that we anticipate the exchange value we want to prove. And as shown above, regression solves nothing.

The second option is value objectification and creation of a special good category. Only by objectification, we can provide the same line of argumentation as for other goods. For other goods, exchangeability is derived from the use value of goods, which is derived from their objective properties. But in the case of money, given the premise “money has no use value”, we cannot derive exchangeability from use value. Thus, money needs to be somehow attributed its property. But either we have no basis for its attribution, but it is not the merit of argumentation, or we must assume such property. Without this, we cannot explain why the money is assigned such exchangeability within a community of all human subjects at once. The thing is that money is a social construct. It is not given by nature as it is in the case of other goods and their properties (!). Therefore, we only have to assume that money has the property of exchangeability per se, i.e. as a good as such; only then we can anticipate it. By that, however, the character of money – exchangeability – is inevitably objectified.

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7 Here, we can only speculate on whether this kind of understanding of assigning a value to the goods did not lead Mises to his conclusions about the regression theorem; i.e. as Menger seems to claim that a good has both use value and exchange value, we can derive one from the other.

As it can be seen, we are still confronted with the problem of explaining the purchasing power of money through the subjective value theory so that in doing so, we neither fall into the “trap of objectivism” nor make *petitio principii error*.

2. **Exchange Value of Goods and Its Intersubjective Perception**

According to Mises, the objective exchangeability of goods in a developed economic community is the most important value that directs and regulates the social economic developments. Wieser calls such value “Verkehrswert (or value in business transactions)”. Bohm-Bawerk says that it is an objective depiction of exchangeability of a good under certain circumstances for another good. Explicating the phenomenon of exchange value is therefore very important for economics. Stating the existence of exchange value is correct. It exists. But what is not correct is its derivation from use value. This necessarily results from Menger’s statement that there are two different ways of satisfying the same need. If there are two different ways, it is not possible to derive exchange value directly from use value. Let us look at it again.

Objective exchange value is attributed to the goods on the grounds that they are exchangeable. Subjective exchange value is assigned to them based on an estimate of their objective exchange value. However, as we have already mentioned above, an estimate of objective exchange value is an argument in circles that does not clarify the assignment of exchange value to the good. No matter whether we apply it to money or other goods. In fact, we explain their objective exchangeability based on a subjective estimate of their exchangeability. However, by doing so, we do not explain the principle of exchangeability (*exchange value*), but a different degree of exchangeability of the goods. The fact that we subjectively estimate the objective exchangeability of a good is not, in other words, an explanation of its exchangeability, but the cause of the existence of some exchange ratio (price) of such good in relation to another good. There is a difference that should not confuse us.

Let us try to explain it even more explicitly. If I dispose of economic good X, it must be of less utility to me than is the utility of any other good Y I get from the other in exchange. Undoubtedly. However, it has nothing to do with the fact that I assign exchange value to the X in my action (exchange). By disposing of the X, from my perspective, I cease to attribute its use value to it in the context of satisfying any of the most urgent needs for me. Otherwise I would keep it. By means of use value of the X, it is not possible to explain, from the perspective of the human subject owning the X, the exchangeability of the X he disposes of. At the time of exchange, the X good has no use value for the human subject; it has use value only for another subject. For me (if I own it and want to dispose of it, which we imply by exchange), the X *only* has exchange value! It should also be noted that if the good had no value for the human subject (neither use nor exchange value), he would not hold it – he would leave it. In exchange, the good which has use value for the human subject is the one he wants to acquire, for example, a good Y which, in turn, has exchange value for another subject. *Using the traditional method of deriving exchange value from use value, we explain only why I want to acquire the Y good, but not why I want to dispose of the X good, and vice versa from another perspective*. It would be even more explicit if either of us or both of us prefer the goods X and Y not because of the utility properties attributed to them which are to satisfy our needs, but because we want to
further exchange X and possibly Y with other members of the community, etc., theoretically up to the point when X and Y are potentially used as two types of money goods (e.g. gold and silver). Before we begin to propose a solution to this problem, we should recall once again what Menger writes about use and exchange value (highlighted text – original)⁹:

"Use value, therefore, is the importance that goods acquire for us because they **directly** assure us the satisfaction of needs that would not be provided for if we did not have the goods at our command. Exchange value is the importance that goods acquire for us because their possession assures the same result **indirectly**."

As we can see, Menger explicitly states that attribution of use value to a good must be perceived in the context of direct satisfaction of the human subject’s needs, and attribution of exchange value must be seen in the context of indirect satisfaction of needs, but in the sense of satisfying the most urgent need of the human subject. It is a different way of satisfying the most urgently perceived needs. However, a different way of satisfying the needs does not imply that it is a **different mechanism of attributing value to the good**. The mechanism of attributing value to the good is identical, i.e. we will always assign a rank to the good (based on the needs), even the one we want to exchange¹⁰, on our perceived value scale. Whether the good is assigned with use value or exchange value, i.e. the method of assigning a rank to it on the value scale, depends only on the extent to which we attribute direct or indirect satisfaction of the need to the good.

Then how to describe, on the one hand, the same mechanism of attributing value to the good(s) and, on the other hand, the difference in the form of a direct or indirect way of satisfying needs? To solve the problem, I use the conclusions of Hayek’s work: **Sensory Order**¹¹. We rely on the intuitive assertion that the human mind is a tool through which we look at the properties of the goods and assign value to them by the determination of the mind.

In the description of the mind, Hayek distinguishes three types of arrangements: physical arrangement (physical order), the system of nerve fibres (mental order) and arrangement of thoughts (sensory order). This article is not aimed at describing in detail the relationships between the orders above. The main determinant for us is the assertion that the physical – objectively given – characteristics of objects of reality – goods (physical order) are classified by our mind by means of a created structured mental arrangement, i.e. through what Hayek calls **mental order**. It must be noted that Hayek claims that perceptions are not classified in such a way that the mind captures a perception from reality which is then processed by the mind (sensory order). On the contrary, he argues that the primacy is grasping reality by the mind; mind is the very organization of perceptions and mind precedes the perception itself and its comparison with the expectations that the mind has created¹². It seems to be an abstract

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¹⁰ The good we want to exchange has value for us. If it did not, we would leave it. What is the reason to have it?


¹² See, for example, in Potužák, P. *Hayek’s Theory of the Mind* (2013). Page 10. WWW DOCUMENT <https://e-logos.vse.cz/index.php?article=344>. Pavel Potužák describes Hayek’s process of classification of perceptions as follows: “Hayek claims that the nervous system is composed of the system of connections between neurons. Impulses which have been induced by the stimuli of the external environment come to these connections and are further transmitted between them. How these stimuli will be classified depends mainly on the position of
benchmark of the mind (the necessity of some arrangement of perceptions, the necessity of making assumptions about reality), which the mind expects to come from reality and which then compares with what has actually “come” by means of the perception apparatus of our body\textsuperscript{13}. In principle, Hayek claims that each individual is given a system of classification of perceptions, but not in terms of full quality, but in terms of what evolution prepared us for, with the system developing during life\textsuperscript{14}. The classification of perceptions is always and in any event the classification of something (expectations) in relation to something coming (perceptions coming from reality). The classification of the perceived properties of the objects of reality creates the so-called mental map (a structural arrangement of neurons and their connections), building a model of the environment with its properties that are then approached by the mind (\textit{sensory order}); the mind itself is also a complex structure of interconnected neurons, the complexity of which “collapses” into what we call free will, i.e. the purposeful reaction of an organism to the expectations in relation to which the impulses coming from the outside are perceived.

In terms of the theory of value, it can be simply explained as follows. Human subject makes a certain assumption about the object of reality which has objectively given, physical and chemical properties. The objectively given properties of the good are perceived by our body’s perceptional apparatus. Interaction between the physical object (good) and the body’s physical perceptional apparatus creates the associated neural system excitations, and the mind categorises its assumption about the object of reality with real excitations coming from reality. Use value of the good can then be perceived in the context of what the mind expects the properties of the good to cause to a man – e.g. moderation of hunger. Specifically, that upon eating bread, its objective physical and chemical properties in the body cause such related objective physical and chemical processes that are transmitted by perceptions to the brain and processed so that the mind compares the expectations (e.g. satisfaction of hunger) with the real result of the stimulus (the body actually shows signs of satisfied hunger). This builds a mental map (neuronal structure) which, subsequently and repeatedly and in a time continuum, attributes value properties which seem to have been once experienced (satisfaction of hunger), in a new perception of the object of reality (bread) in other time contexts. In this way, the mind does not react to the object of reality (bread) only in a particular present, but also in the context of another expectation of what the good (bread) will bring. Given the facts above, for instance,

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\textit{a particular impulse in the whole system of other impulses coming to the nervous system. And this process of classification is precisely what we call our sensory perception. In other words, what sensory quality will be induced by a particular impulse is dependent on its position in the entire structure of other impulses. This system of connections was created by responses of an organism to the external (and internal) environment during phylogenesis or ontogenesis. ... Hayek then adds a key claim highlighted by most of works dealing with his theory. ... Hayek ... reverses the traditional chain describing that people first register a certain sensory perception that will eventually enable the perception of the surroundings. On the contrary, Hayek claims that perception is an organization of perceptions that precedes the perception itself. Therefore, first perception comes, or more precisely understanding”, and only then the relevant sensation comes.”} \\
\textsuperscript{14} Other animal species are equally “pre-prepared” to perceive the world; for instance, a cat is adapted to respond to movements of a mouse, and the mouse is adapted to respond to being hunted by the cat. A man is equally adapted to approach (perceive) the world, for example, by what we call language and mind with the related neural system and the perceptional apparatus.
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bread is preferred to music if the body, for example, shows the stimulus of hunger and does not show the expectation associated with the satisfaction brought by music. According to Hayek, the mind also has a specific property allowing to modify the classification of perception of the good (bread) in the context of other similar goods (white bread roll, flat bread, rye bread, gluten-free bread), supplement the map with other classification properties (e.g. mouldy, old, hard, etc.), or use bread for other possibilities of meeting the needs, or reclassify the overall map of perceiving the problem of hunger and its solution through another “group” of goods (meat, vegetables, ... but also Prana). The foregoing also implies that satisfying needs by assigning use value to goods may be of only similar character at the most for different individuals. Specifically, for two reasons. The first is that physical and chemical processes which are induced in our body, for example, by eating bread can only be of a similar nature for someone else’s body. The physical and chemical properties of bread are related to the different – individually determined – physical and chemical digestion processes. This stems from different body structures of different individuals that are not identical; for instance, someone may have a coeliac disease that causes another kind of resulting perceived reaction (I get diarrhoea instead of satisfying hunger) to the object of reality (wheat bread). And secondly, the perception and classification of given perceptions that are induced may only be similar, since the mental maps themselves are individual. However, in the case of exchange value, it is a non-subjective level of the problem. The fact that I exchange something implies another person (alter Ego) who enters into the relationship. It is a fundamental problem and another kind of qualitative perception of value. As we can see, we are confronted with the problem that the mental maps of two human subjects must inevitably differ from each other and are also permanently modified. So how can we explain the assignment of exchange value to a good, which must be necessarily mutually perceived in an intersubjective way? We should also realise that the principle of assigning exchange value must be the same for all individuals! It is a totally different character than that of the assignment of use value, which is inevitably subjective. In principle, it is a question of “How do we assign exchange value to the goods?”. We apply the same mechanism of classification of the mind as we applied to the description of use value assigned to the goods to the classification of perceptions related to exchange value. In the case of classification of use value, the system of mind preferred the expectation of satisfying the highest current urgency of some need N1 to the less urgent need N2. The same principle must apply to the assignment of exchange value to the goods, but with a different focus of the assignment of value on indirect satisfaction of N1 preferred to satisfaction of N2. We also need to use a classification mechanism that, on the one hand, prefers N1 to N2 for the S1 human subject, but, on the other hand, classifies the satisfaction of N1 for S1 indirectly (with something owned by S2, i.e. the Y good), but necessarily for what is owned by S1, i.e. the X good and, of course, vice versa for S2. The mind inevitably creates here a new form of abstraction related to the exchange. It is a classification of a relatively simple mathematical calculation of the ratio. That is the X good which S1 disposes of for acquiring the Y good is assigned a new abstract property in the form of a calculating unit of the ratio, related to acquiring the Y good to which S1 currently assigns the highest use value in the context of the most inevitable N1 need. Given that it is a
mathematical function, it is applicable to each individual, enabling us to explain the intersubjectivity of the identical way of assigning exchange value to the goods by each human subject. The thing is that mathematics is perceived equally.

The assignment of such abstract and new property in the form of a mathematical function of the ratio could not be a significant new quality for some of our prehistoric antecedents. Because they also applied the ratio to the assignment of use value to the goods, which, as we can claim, preceded the perception of exchange value. The classification mechanism reflected at least preferring more goods to less goods, thus creating in the mind an abstract idea that, for example, 2 apples are more than 1 apple. Similarly, the classification mechanism of the mind is exposed to perceptions associated with the fact that preference for each additional apple causes marginal satisfaction of the need perceived up to the point when human subject is exposed to a more urgent need, such as music which will be assigned a higher rank by the classification mechanism in terms of preference. In other words, “after eating the food, human subject is more likely to prefer relaxation”\textsuperscript{15}. The principle of marginal utility could also create an incentive to classify the surplus of a good when human subject faced the possibility of either leaving it or exchanging it. However, it also created the possibility of comparing the assignment of utility to the goods, i.e. that different goods, in a different way and using different intensity, satisfy whether identical or various kinds of needs, for example, an apple is for hunger, a guitar is for music, but a pear is better for hunger, or a drum induces better musical feelings, etc. Due to the functionality of the mind in terms of the possibility of applying the formal logical mental models of reality to other types of stimuli from reality, we can assume that these emerging or existing structures of the mind also apply to the stimuli coming from other human subjects (S2... Sn) living together with S1 in a community\textsuperscript{16}. Applying the perception of the ratio from other areas to the area of exchange should not therefore be a significant qualitative change; it could rather concern intuitive and natural activities carried by still vaguely defined Ego against alter Ego.

When explaining exchange value, we need to realise that it is an additional abstract quality of assigning a new property to the goods over the assignment of use value. Perception and the ability to look at or identify with a similar way of perceiving the utility properties of the goods which human subjects dispose of, have certainly influence on exchange from the perspective of the other (alter Ego), however, not in respect of assigning exchange value to the goods, but in terms of determining the amount of the resulting exchange ratio, i.e. the exchange price. In view of the fact above, the assignment of exchange value to a good always results in two prices – bid and ask. From S1’s perspective, bid price is determined a ratio of e.g. 1X for 5Y, and from S2’s perspective, ask price is determined as a ratio of e.g. 9Y for 2X. Thus, ASK price is determined by S1 in terms of assigning exchange value to X and use value to Y and BID price is determined

\textsuperscript{15} Chroustal, F. Personal Interview. Trenčín. on 21 April 2018.

\textsuperscript{16} Thus, it is not unrealistic at all to make an assumption about the spontaneous occurrence of exchange as a totally unconscious activity even at the pre-conceptual level, without the need for an assumption of a fully conscious human being on the basis of relational altruism or reciprocal altruism. In the mind, the “sediments” of this activity also created sufficiently strengthening connections, which could then be fully recognised by human subjects and subsequently used by them purposively. cf. consistency with PAVLIK, Ján. About the Spontaneous Emergence of the Norms of Distributive Justice and Catallactic Rules. E-Logos – Electronic Journal for Philosophy, 1999. ISSN 1211-0442. cf. inconsistency with the claims in Hans-Hermann Hoppe, F. A. Hayek on Government and Social Evolution: a Critique. <https://mises-media.s3.amazonaws.com/rae7_1_3_3.pdf?file=1&type=document>
by S2 in terms of assigning exchange value to Y and use value to X. This is why the prices vary and are two on the market.\(^\text{17}\)

The related question is why human he subjects attribute different degrees of exchangeability to different goods. It is related to the view of the objective properties of the goods. Given that the attribution of exchange value to the goods is of a formal logical nature – it is a mathematical ratio – the objective properties of the goods are applied in terms of this formal logical approach to the goods. This indicates that there will be a difference in exchangeability between real estate and wheat, wheat and livestock, depending on how their objective properties enable determination of some meaningfully perceptible unit of exchangeability.

The assignment of exchange value to the goods causes the mind to be confronted with new phenomena and motivates it to create new levels of abstraction related to approaching and perceiving the goods. Calculation. The thing is that one of the incentives associated with exchange is the current finding of what exchange ratio is between some two or more goods in the context of two or more individuals. Given that two or more human subjects are involved in the process at once, their perceptions of exchange ratios of the goods are, of course, fully subjective, but they also gain an insight into objectively given (appearing in reality) exchange ratios of the goods in the same manner.

At the level of attribution of use value, we can only assume that the X good is assigned by S1 similar utility to the one attributed by S2 to the X good. It can be estimated from observation, for example, from the fact that S1 and S2 together carried out an identical activity, e.g. picking the identical fruit, and then they ate it. However, by the introduction of exchange, the qualitative perception of mutual preferences of S1 and S2 necessarily changes. Human subjects’ preferences are not perceived only by observing what the other does, but they are inter-subjectified. It is due to the determination of exchange ratios of the goods. Human subjects seem to “economically” communicate in this way; for example, they perceive the fact that an hour of fruit picking is/was exchanged for e.g. 2 kg of meat at some time and under some conditions. Calculation becomes a new utility phenomenon. Based on calculation, human subjects can better assess the effectiveness of their activities in terms of indirect satisfaction of their needs, compare the effectiveness with each other and decide which activity brings them greater benefit.

The explanation of attribution of exchange value to the goods shows us that exchange value is a separate quality (way) of meeting the needs of human he subject. It is a superstructure over the perception of use value. However, it is not directly derived from it. Use value is a sufficient condition for its existence. The necessity involves the perception of exchange value by human subject who assigns a new abstract property of exchangeability to the good owned by him.\(^\text{18}\)

But in terms of the aim of the work we set out, it is not possible to describe and explain the exchange value of money – a universal medium of exchange on the basis of these arguments. Because we lack the description of exchangeability of a good in consistent and ever-repeating

\(^{17}\) The existence of two prices in the exchange of goods can be considered to be empirical proof of our argumentation about exchange value as a new quality attributed to the good being exchanged.

\(^{18}\) It should not be confusing for us that for S1, exchangeability of the X good follows from its use value for S2. S1 can anticipate it, but it can also anticipate that S2 wants to further exchange X in a consistent exchange. Therefore, the attribution of exchange value is necessarily a new abstract quality of the X good.
exchanges, i.e. in a time continuum. It is also related to the second incentive that the exchangeability itself brings out. Duration of abstraction of the exchange ratio in time. As mentioned above, human subject lives not only in the current world, but also in the expected future (Hayek, 1952). Therefore, we need to incorporate the phenomenon of time into the description and explain the intersubjective concept of attributing exchange value to the goods in time that people ultimately perceive and approach.


A traditional explanation of attribution of value to the goods is based on the fact that we prefer the good which satisfies our most urgent need at that moment. But as Hayek states in his *Sensory Order*, a human being lives not only at the particular present, but also in the ever-expected future – in a time continuum. Human subject must be aware that he assigns value to several goods at the subjectively perceived present (day, week), and that it does not concern a consistent satisfaction of needs in the sense that now I satisfy the N1 need, then I focus on satisfying N2 and consistently up to Nn. Therefore, it is necessary to look at assigning value to the goods not only in terms of some particular most urgent need, but rather in view of an urgent complex of needs. In a wider time-continuum (e.g. month, year, human life, but also providing for descendants), it must only concern the idea that human subject knows that today he has some *complex of needs* and that he will satisfy such needs as a complex. It is not about identicalness of the needs. It is a case of perceiving the existence of an inaccurate complex of needs.

The perception of time causes the mind to respond to other problems associated, for example, with the fact that the objective properties of the good that satisfied some needs of human subject today, may no longer meet the needs in a moth’s time, whether because the objective properties of the good (e.g. it decays) change or human subject’s needs change (he is not hungry, but thirsty). There is also the same problem when assigning exchange value to the good in time. The fact that human subject assigns exchange value to the X good today does not mean that he

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19 cf. Nick Szabo, who writes that in a barter exchange, people are facing a very significant problem: „If there are n goods and services to be traded, a barter market requires n\(^2\) prices. Five products would require twenty-five prices, which is not too bad, but 500 products would require 250,000 prices, which is far beyond what is practical for one person to keep track of. With money, there are only n prices – 500 products, 500 prices.” To remember 250 thousand prices vs. 500 prices is definitely a difference, and our mind (even according to Hayek) tends to simplify. But what is the second condition for explaining money through barter? The necessity for further circulation of the good. But how to clarify the further circulation of the good without people’s thinking of the good as a money good beforehand? In other words, how to explicate that the good began to circulate. We can also state that the problems associated with barter are, figuratively speaking, ridiculous compared to what human subject faces in exchange in time. If, in the case of mutual barter of 500 goods, we deal with the problem of remembering 250 thousand prices, then, in the case of their determination in a time continuum, it is an insoluble problem in respect of constant changes in the prices. Szabo, N.: Shelling Out: The Origins of Money. WWW DOCUMENT <http://nakamotoinstitute.org/shelling-out/>

20 The argument can also be supported by Rothbard’s claim that we do not relate marginal utility to any unit of the good, but to a meaningfully perceived unit of the good. We can apply this argument, mutatis mutandis, to the perception of ourselves and our needs in a time continuum. We do not perceive every single second, every single need, i.e. in a particular way. We perceive the present and related needs in some meaningful – subjectively given – time continuum and related needs as their complex. See also Rothbard, M.: Toward a Reconstruction of Utility and Welfare Economics. WWW DOCUMENT <https://mises.org/library/toward-reconstruction-utility-and-welfare-economics-1>
will reassign it to the good in a moth’s time. This is because the good changes its objective properties (it decays, comes apart) for which it cannot be assigned its exchange value; he changes the perception of such good and rather assigns use value to it (he wanted to exchange it, but eventually, for example, he eat it), or the conditions relevant to assigning its exchange value as such change in time; for any reason, there is nobody who wants the X good.

Equally, time perception makes human subjects confronted with the possibility of postponing fulfilment of exchange that may not happen at the same time. Human subjects therefore face the problem of reflecting what we call debt. Time exchange also inevitably encounters other two phenomena which form, as we know, its integral part. The first is time preference and the second is interest rate.

The concept of time preference is not alien to the members of the Austrian School. In terms of this work, it might be appropriate to point out that the concept of time preference is explicable even within Hayek’s concept of the mind. The point is that one of the characteristic features of the mind is that it prefers grasp those stimuli from reality that have the least possible dispersion between the expectation and the real stimulus. In terms of time preference, it means that what is earlier is preferred to what is to be/can be achieved later.

Interest rate is the second phenomenon. It should be noted here that this work is not based on the traditional concept of interest rate in terms of time preference, as described today by a considerable number of members of the Austrian School. In my Theory of Interest, I have sufficiently criticised the approach and demonstrated that the so-called originary interest\(^{21}\) is “an idea of at least two human subjects of how the goods owned by them are and will be valued in the context of their subjectively perceived time continua”. I have also proved that interest as a phenomenon can only be reflected in exchange, not in individual’s action itself. Interest is a reflection of the relationship between human subjects. Interest arises as a spread between two perceived spreads of human subjects. One considers the possibility of A1) hoarding and supplementing its portfolio of the goods in time by himself in order to prepare for his uncertain future against A2) the exchange of part of his goods portfolio today for acquiring some future goods which are to enrich his goods portfolio as better preparation for the future. In terms of addressing his preparation for the uncertain future, the second subject considers B1) the necessity to make higher savings today in order to secure savings for development of his economic project against B2) the state that he acquires the goods today from the first human subject without having to make his savings, however, in return for that he will “share” part of the results (ends) of his economic project in the future. The spread of A2 against B2, i.e. the exchange in time, creates perception of interest based on an alternative assessment of A1 against B1. Of course, the process is also affected by time preference, when S1 prefers a shorter time frame for exchange with higher interest, and S2 prefers a longer time frame with lower interest.

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\(^{21}\) cf. Misese’s definition: “\textit{Originary interest} is the ratio of the value assigned to want-satisfaction in the immediate future and the value assigned to want-satisfaction in remote periods of the future. It manifests itself in the market economy in the discount of future goods as against present goods. It is a ratio of commodity prices, not a price in itself;” in Mises, L: Human Action. page 526. WWW DOCUMENT

<https://mises.org/library/human-action-0/html/pp/806> In terms of the Theory of Interest, the critique of Mises by J.G. Hülsmann is also interested. However, Hülsmann did not manage to resolve the problem of interest derived from time preference. cf. Hülsmann, J.G.: Theory of Interest. WWW DOCUMENT
What does interest mean in terms of the mind’s categorisation? If human subject addresses the problem of meeting the needs in the future through the activity of the other, he must inevitably categorise and compare how the idea of the other’s activity in the future changes the way of satisfying his perceived complex of expected, but also unknown, needs in the future.

Let us look at direct exchange. Either it occurs in the sense of a supposed higher level of variability of satisfying the most urgently perceived complex of needs in a subjectively expected future if we assume that the exchange concerns a good that human subject does not provide for himself, i.e. he collects apples, but also wants pears. Or it takes place at a supposedly higher level of efficiency of satisfying a complex of needs in a subjectively perceived future if we assume that the exchange concerns a good that human subject provides for himself, but eventually he acquires it by exchange, i.e. I pick apples, but the other is able to pick them more efficiently, so I rather exchange them for meat taken from the animal I hunted.

However, if we incorporate time into exchange, in terms of variability and efficiency the exchange is categorised at a higher level of abstraction given that human subjects work with the projection of the future. In the context of direct exchange, it is current preparation for future (however subjectively perceived long period) satisfaction of the needs through existing goods. But in the context of exchange in time (debt exchange), although it is current exchange of existing goods by the S1 human subject, the fulfilment of the exchange takes place at another time by the S2 human subject. In terms of variability and efficiency of satisfying S1’s needs, it is planned current preparation for the future in time “t+n”, but is preceded by future fulfilment of exchange in time “t+1” through the exchange of the good (clearing a debt) by S2. The same also applies mutatis mutandis from S2’s perspective.

S1 therefore assigns (categorises) the exchange value to his goods today (t) in relation to a still planned potential of a higher level of variability or efficiency of satisfying the complex of his needs in the future (t+n). S2 perceives the situation in reverse, i.e. he compares (categorises) a current higher level of variability or efficiency of satisfying the complex of his needs as advantageous with the expected exchange value of the goods, either arising from the activity carried out by him in the future or by attributing the exchange-value property of the existing goods owned by him in the future. Interest is generated by the common perception of the two planned strategies by both subjects in their debt exchange.

While the direct exchange in time “t” is executed and completed, the debt exchange leads to a jointly perceived and lasting commitment. Such commitment is related to identically categorised strategies, which are also different in terms of the time period of their fulfilment. In the exchange, both subjects prefer a higher level of variability and efficiency of satisfying their future-related needs (t+n). While S2 needs the goods today to easier prepare himself for the future, S1 equally provides them today to be able to meet some complex of his needs in the future.

An attentive reader could notice two important things. It is still nothing more than some form of the mind’s categorisation. The first difference is in a degree of abstraction; human subjects thinks in a time continuum. The second difference is in the mutual shared perception of the activity, which lasts at least for the duration of commitment. In relation to direct exchange in time “t”, the difference is that the fulfilment of the exchange ended at that moment in the
absolute sense. After the direct exchange and mutual assignment of use value and exchange value to the goods by human subjects, the subjects perceive the exchange as a past\textsuperscript{22}, which may be inspiring in terms of the results of its assessment ex post, but not crucial to meeting their further needs.

In the case of direct exchange in a particular time “t”, we are also confronted with the problem of identicalness of perception of exchange value. The S1 human subject assigns exchange value to the X good and the S2 assigns it to the Y good. We have no reason to assume that S1 also perceives Y in terms of exchange value; of course, we can, but we do not have to. And even if S1 or S2 attributes exchange value to X or Y in advance, e.g. S2 picks apples (Y) because he assumes that he will exchange part of them with S1 based on some past experience concerning the fact that S1 asked for them in time t-1, it does not imply that the apples (Y) will eventually have their exchange value. S1 may not want them in the end.

However, exchange in a time continuum entails another kind of attribution of exchange value to the goods. It stems from the mutual identical perception of the existence of the commitment. Not only the commitment must remain in the mind (if human subjects forgot it, it would be irrelevant to speak about exchange), but it also allows a new level of classification of the stimuli coming from reality\textsuperscript{23}. S1 may longer connect the assigned exchange value of the good exchanged by him in time “t” with the exchange value of the good to be provided later in time by S2 (as principal and interest). The exchange ratio as the abstraction of the mind simply persists and is economically relevant, as it relates to the future and not to the past.

But what is important is the agreement on the good that S2 is to return in the form of what we call (principal and) interest. The thing is that S2 pre-assigns exchange value to the good without facing the problem of whether he will be able to assign exchange value to the good in the future at all (cf. the example of apples above). He has to assign exchange value to the good because he has already agreed on that with S1 in time “t”. At the same time, it does not matter whether S2’s activity which is enabled by acquiring the goods from S1 in time “t” will be of a useful or exchangeable nature for S1 for the duration of the commitment. The agreement on the good which represents the repayment and interest which are to be returned by S2 to S1 in time “t+1” only has exchange value for S2. S2 therefore assigns exchange value ex ante to the commitment

\textsuperscript{22} Mises correctly writes about the topic: “As has been pointed out and must be emphasized again, there is no need for him (acting man) to look backward to the history of various capital goods available. Acting man counts waiting time and the period of production always from today on.” Mises, L.: Human Action. page 494. WWW DOCUMENT <https://mises.org/library/human-action-0/html/pp/798>

\textsuperscript{23} I do not address this relationship from other social and cultural standpoints which, of course, complete the view of the exchange in question. Similarly, it is not important in our interpretation whether or not human subjects fulfil the conditions of exchange, which may have happened in historical terms, for example, on the grounds that the one who did not fulfil the conditions of exchange was a more significant member for the community than another one, causing that the countermeasure due to failure to repay in the form of a sentence vs. remission of the sentence, entailed lower costs for human subjects in the community in favour of the remission of the sentence than in the case of recovery; cf. the below-mentioned argument about the spread related to exchange in time in respect of the choices made by human subjects from among several goods regarded as a medium of exchange. In the description, I only deal with the problem of how the goods gain their exchange value ex ante. Non-fulfilment of the conditions for exchange does not imply that human subjects do not perceive the exchange value assigned to the goods in this way. On the contrary. Communication of that exchange in the community, whether fulfilled or not, must necessarily imply the possibility of recognizing the attribution and duration of the exchange value to the goods also by other human subjects living in the community.
expressed in some good X in a time-defined future with certainty. It is a significant qualitative change. In the case of direct exchange, S2 cannot be sure in producing the Y good in time “t-1” whether he will be able to assign exchange value to it in time “t”. In the context of interest, S2 already in time “t” assigns exchange value to the Y good in time “t+1” when the exchange is fulfilled. S1 may, but there again may not assign exchange value to Y. But what is important at the beginning is what S2 provides.

The obligation which commenced towards S1 due to postponement of exchange in time also implies that it does not matter whether Y is still produced (or created), or whether it has already been produced and will be used to settle the debt in the future. The obligation implies that even a potentially existing good Y used for clearing the debt (principal and interest) is with certainty assigned exchange value associated with another period of time. Not only a good being created, but also an existing good might not have exchange value assigned in time “t+1” without the agreement made in time “t” and its duration might not be secured.

The good of money may arise: Assumptions

In order to explain the occurrence of assignment of universal exchange value to particular good in a historical context, we can only use the method of compliance of logical interpretation with empirically possible development, i.e. we can describe a logically possible development process that is not accurate in detail but in its essence.

Since money is a social construct, it must not surprise us that people used different goods as money in the past. This does not mean that we assign the property of universal exchangeability and the highest rate of marketability to a specific good in the form of salt, fur, livestock, or gold. We assign it to the good which we use as money. This indicates that the one who uses salt as money assigns universal exchange value to such salt just like the one who assigns universal exchange value to fur he uses as money.

Another assumption is that we need to discover the potential for the occurrence of correlations of the mind, which subsequently allowed our historical antecedents to reflect the problem arising from the exchange of goods using money in a time continuum. It means that logically there must first be social activities and relationships that are not directly related to money. However, they also have the characteristics behind which the mind reflects the links (the sediments of thinking) that can then be used for the emergence of the social construct of money. Therefore, it is necessary to look for sediments for these correlations of the mind not in a large community that probably did not exist, but on the contrary, in a small community of our antecedents. Exchange on credit (debt) with complete aliens would be too risky in the sense that theoretically, the individuals might no longer meet each other. It could therefore be about direct family ties or wider clan-family ties appearing in activities, such as providing for descendants using goods in time, or connecting directly unrelated, then resulting in, for example, the institute of marriage (accepting “strange” human subjects), but it is also possible

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to think about some forms of primary altruism, but also about a “solution” to potential conflicts over sources of livelihood, territory, or settlement of disputes, etc.\textsuperscript{25}

Similarly, we can assume that the discovery of exchange in a time continuum was spontaneous. In the sense that direct exchange was postponed first for a few days, later for a week or a month, or for an annual period. There is no point to think about a longer period of time in respect of mortality of human subjects or their vaguely defined Ego. Similarly, we can assume that interest have not yet been formulated and explicitly perceived at the given time exchanges. In terms of expected use value of the goods being exchanged in time, the formulation of the amount of interest was problematic. If one subject promised an apple today and the other, in return, promised a pear in a month, the exchange includes interest (in both logical and value terms) which is, however, not exactly formulated and perceived. Equally, its amount could be unperceived given that it was minimal.

However, a significant prerequisite is a strongly perceived condition for the fulfilment of the obligation, if not with the agreed object of exchange, then with something else (re-negotiated), which is common in the community (work, any other good having use value, etc.). A community is based on certain rules, and human subjects who do not fulfil exchange are threatened by excommunication, punishment of the entire community, etc. The force of the commitment is necessarily subject to some group rules\textsuperscript{26}.

\textit{The good of money may arise: From assumptions to the explanation of the principle}

In the case of exchange settled with a good in time, where S1 assumed satisfaction of a need in terms of use value, he had to inevitably face the problem of changing the perception of use value of the good in which the exchange was settled, from time to time (especially when the duration of exchange was extended). In simple terms, if he thought that 10 apples that were to settle the exchange of 5 pears from the last week, then after one week, he came to the conclusion that if he knew that he would ask for one bread that he prefers more for any reason. It might be associated with a change in the conditions of anything in time, for example, relative surplus, but also of relative lack of a good.

A higher degree of durability of attribution of use value to the goods is suitable for securing a higher degree of exchangeability of the goods in respect of their unchanged objective properties (they cannot, for example, decay), but also given the fact that they are assigned utility by several human subjects at once; a higher degree of uniformity and divisibility of the goods is also necessary to ensure a higher degree of their exchangeability. Thus, in relation to time, human subject is sufficiently motivated to prefer such goods in exchange in time to the goods that are not divisible and uniform and are also exposed to the risk of frequent changes in the use value.

\textsuperscript{25} As we describe the principle, it is not necessary to name and apply the assumption of commitment to all kinds of potential activities of a prehistoric group; social anthropology would probably point to other specific examples of the existence of social ties.

\textsuperscript{26} In my interpretation, I use a modified version of Hayek-Pavlík’s theory of cultural evolution of rules that affect spontaneous economic development in the community. For example, see Pavlík, J. PAVLÍK, Ján. About the Spontaneous Emergence of the Norms of Distributive Justice and Catallactic Rules. E-Logos – Electronic Journal for Philosophy, 1999. ISSN 1211-0442.
assigned to them in a community. In other words, in exchange in time, human subjects would rather prefer something that is generally needed in a community to e.g. apples which, for example, only two members of the community enjoy. It implies that the problem described by Menger of tradeability and exchangeability of goods is primarily not a solution to the problem of double coincidence of wants, but rather a solution to the problem of double coincidence of wants in a time continuum.

In the sense of a specific (but still illustrative) example, it might have concerned the fact that human subjects in the community perceived some form of a technological change that caused that, for example, “oats” which also had expected utility properties, could be preserved by them for a longer time continuum. They also carried out some community activity, for example, in the sense that human subject Sa1 currently helps Sa2 with some work (100 hours of work), and Sa2 is obliged to Sa1 in terms of clan reciprocity, namely to provide Sa1 with 10 kg of oats three months later (after harvest); let us say that reciprocity is a rule of such clan which is based, for instance, on knowledge that oats are needed by everyone in the community. At the same time, the A community ensures that if Sa2 fails to fulfil his reciprocal obligation, then Sa1 will get what belongs to him with a discount e.g. from a common oat “fund” and Sa2 will be, for example, excommunicated and have to take care of himself.

10 kg of oats automatically gained exchange value during a time period of 3 months (for 100 hours worked). After obtaining the oats, Sa1 stores them. In a few months, he will consume a portion of them, e.g. 5 kg. However, given that the oats are properly stored, they do not lose their objective properties, they are divisible and uniform; human subject can assign a new exchange value to them. Let us assume that the oats were further used as a marital dowry – Sa2 obliges himself to give 5 kg of oats to Sb3 if Sb3 obliges, in turn, to Sa2 to ensure that in 6 months Sa2’s son will gain Sb3’s daughter belonging to the clan B. In this way, a portion of the oats gains exchangeable value in a time continuum and the oats gain a calculating unit against work in the clan as well as part of the dowry when clans A and B unify. In a 3-month time continuum, other subjects in the community can thus recalculate other ratios of oats, e.g. 10 hours per 1 kg of oats, or in the context of 6 months, that 5 kg of oats was a third of the dowry upon mutual agreement of members of the clans A and B, etc.

In this way, correlation of thought could arise in a clan, but also between clans. As human subjects subsequently merged into larger social units (multiple clans +n), then through the sediments of thinking thus created in the background of the given activities, the mind of human subjects seems to be pre-prepared to “repeat” the assignment of exchange value to the good “oats” at the level of a larger social unit, and even in other activities (economic exchanges) and not only in the case of activities which we cannot explicitly regard as exchange yet. Human subjects thus reflect that the oats are also used for a purpose other than bread production (use value), i.e. for exchange and the associated calculation of economic exchange in time. So did we manage to explain how a good is assigned general exchange value? No. We need to continue with our interpretation, specifically by describing the new abstraction. The issue is that human subjects were confronted with other challenges.

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27 The claim must be perceived in the context of an emerging language by which the abstractions of the activity are communicated further in time and intergenerationally transmitted.
Human subjects are discovering a phenomenon yet unknown for them by how a higher level of calculation associated with exchange in time is enabled to them. Something that they always intuitively (value-based) incorporated into exchange in a time continuum, but they seem like not being able to see it given the limitation of their calculation possibilities. They discovered a phenomenon of interest. A new abstract property which is not attributed to a good, but stems from the activity of human subjects, i.e. the exchange itself in a time continuum.

The continuing exchange ratios of the goods and their elimination by a specific good M enable a better calculation. It is not as if it did not exist before. For the mind, any exchange creates a stimulus of the abstraction of an exchange ratio that can persist – e.g. a community perceived that S1 always liked apples more, i.e. he preferred apples to pears. And this knowledge was used by other subjects in the group in exchange with S1, which is related not only to the good in question, but also to other goods. But what exactly exchange in time enables is **duration and assignment of exchange value ex ante** (as if with certainty) to some good; in the example above, the oats gained exchange value for 3 months (against work) and then for another 6 months in the form of dowry, while the perceived obligation existed and lasted in the mind in the context of the abstraction “oats are exchangeable”. A higher degree of abstraction and duration of exchange also enable a more accurate formulation of exchange ratios and realisation that human subjects also use in exchange something we call interest. Interest reflection also helps human subjects to further specify calculation exchange ratios in a time continuum. For better imagination, it means that human subjects could explicitly distinguish that if the exchange of 100 hours of work for 10 kg of oats in 3 months took place today, it would have another exchange ratio, e.g. 100 hours of work for 8 kg of oats.

It is then the subsequent abstraction of the mind, after human subjects carried out XY exchanges in a time continuum, which were mediated with several goods or one particular good, thus being able to spontaneously “discover” the phenomenon of interest. It indicates that besides other things and in the context of a time continuum, human subjects implicitly and in terms of value attribute to exchange something we call interest, but what could appear explicitly only through the calculation abstraction in the exchange of goods in time. Since human subjects prefer more to less satisfaction of needs (not necessarily in quantitative terms) and faster to slower (in subjectively perceived time), there must be inevitably preferred exchanges that, based on subjective perception, ensure faster satisfaction of needs than something that makes it more slowly and which also ensure better satisfaction of a higher number of needs than worse satisfaction of a lower number of needs.

In other words, it means that, for example, S1 will prefer the exchange from which he will get the more preferred apples from S2 faster (in one month) for today’s exchange of e.g. “hoe and spade”, and S2 have to allow for the obligation to fulfil the exchange by that his activity must secure **at least** apples for S1. But in a similar exchange, some other S3 may prefer apples from S2 in two months for the “hoe and spade” (he has the same tools). In that case, S2 would opt for exchange with S3. However, if S3 finds out that there was a previous exchange between S1 and S2 of this nature which was fulfilled during one month, he may prefer the same or require better conditions in some way. It will depend on how much S1 prefers apples to S3 and whom S2 can better agree with.
The expansion of debt exchanges in the communities then led to a higher level of awareness of interest. Interest and time preference have been used (and are still used) to decide on what existing goods (savings) should be exchanged for something to which human subjects assigned value associated with future satisfaction of their needs (indirectly), where the “something” either has just been created or already existed. Exchange in time did not motivate human subjects to deal only with the problem of double coincidence of wants in time, but also with the need to express the commitment itself and its duration in time in some good M that the community knew and also attributed a use value to it which, however, was not absolute for the community. It indicates that M could not be anything crucial to satisfying some significant utility needs. The fact that interest and debt exchange are expressed in M, i.e. exchange value persisting in time and assigned to the M ex ante, it was also applicable to further consistent exchanges in time. This also enabled a calculation of the exchange of other goods against the M and also in direct exchanges of M for other goods. Since exchange in time also includes interest, then the good which best reflected the phenomenon of interest, or debt exchange could also become a calculating unit – money. Human subjects do not subsequently in time assign only a universal exchange value to the M, but they also attribute a universal use value to it in terms of a possible calculation in M in a time continuum. In order to maintain such utility in time, it is also necessary that the amount of the M good optimally responds to the mediation of the activity of debt exchange. The good money – M has just come into existence.

The concept of the optimal amount of M needs to be perceived here as not an unchanging quantity. The optimal amount of the M good is such quantity which ensures that the marginal creditor with the marginal debtor carry out the last possible marginal exchange in time. A logical question that arises is why it is not any amount of the M good (which is currently claimed by some members of the Austrian School), or a rigid amount of M (Bitcoin). The character of M being a good usable for exchanges clearly implies that the exchange ratio can be realised with any amount of M. In principle, we can always recalculate the number of M against a certain number of goods and thus determine their prices. It is true. However, determining exchange ratios (prices) is not a problem confronting the human subjects. The problem confronting them is the certainty of preserving the abstract exchange value of M. Making the subsequent calculation in M is than a simple operation. The exchange value of M must be preserved in time for successful calculation as use value of M. And it can be preserved in time only if M optimally mediates the creditor/debtor relationship in exchange in time. If there is only a little or even a rigid amount of M (Bitcoin), the marginal debtor with the marginal creditor will not realise the marginal exchange required in the community. And if there is too large amount of M, the marginal debtor with the marginal creditor will realise one more exchange, the result of which may cause the exchange not to be fulfilled for some reason28.

28 One of the problematic parts of the theory of money and the business cycle is just this point. Money is a good of a social nature that indirectly mediates the satisfaction of the needs of the exchange between the human subjects. By money, we express the exchange in time, or our economic activity in time that may also be fallacious. For this reason, in the realisation/non-realisation of debt exchange in time, we cannot surely say whether the realised/unrealised marginal economic exchange will be economically meaningful. Of course, we do not know that in direct exchange of goods or exchange without money either. However, given that money (as a good) is used by us and enters into any indirectly-mediated exchange, a wrong result it may mediate affects not only the result of the exchange as such, but also the value determination of the good of money itself, which is
The point is that the M good does not solve the problem of the exchange of goods. M mediates the marginal satisfaction of human subjects’ needs in an indirect way, i.e. mediates the activity of exchange in time per se. The view of exchange as the exchange of goods is a technocratic description of what is happening, not a value description. The marginal exchange in time continuum means that, in the event of realisation of the last desired exchange in time, the marginal needs of human subjects are indirectly met in time continuum, with any desired subsequent satisfaction of the needs of human subjects being realised directly, i.e. by human subject’s activity itself. The prices of the goods expressed in M are only the result of this process, and only then can we declare that prices are optimal.

It implies that the amount of M must be discovered exactly in the same way as the optimal number of other goods is discovered in the economic community. The competition process in this case means that the one who is satisfied on the market is the marginal debtor to whom the marginal creditor is willing to lend his capital resources on a voluntary basis and without any intervention. If the debtor is not satisfied under such circumstances, there is no creditor who would be interested in the economic activity of the potential debtor, and vice versa.

The process that influences the realisation of marginal exchange in time (indirect satisfaction of needs in time) through a non-rigid amount of M is of a dual value and economic nature – time and interest. A shorter time associated with debt repayment and higher interest (assuming some form of social rules relating to the fulfilment of the obligation), and vice versa, a longer time and lower interest, lead to a higher level of motivation to carry out the exchange, and vice versa; I would like to note that the exchange is also influenced by other factors in the form of some commonly used rules of debt recovery, affecting the amount of the spread of exchange. If time preference and the perceived amount of interest rate in the community cause the marginal exchange not to be realised, the costs relatively increase in the sectors unrelated with M production for monetary purposes and relatively decrease in the sectors focused on the additional supply of M unit on the market for monetary purposes, which motivates M producers to deliver a new unit for monetary purposes. And on the contrary, of course. M suppliers (M suppliers produce M as such and do not distinguish between purposes it will be used for) thus automatically respond to changes in the interest rate and time perspective of debt exchange as well as to the spread related to social rules governing debt exchange. But from their point of view, they only perceive the increased demand for supply of a new M unit onto the market.

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29 Social rules have a significant effect on the extent of the spread of debt exchange. If it is commonly used in the community that collateral for exchange must be, for example, a family member “pledged” to creditor’s slavery (according to Graeber, the “rule” used in the past), then the last potential realisation of the exchange unit in time is, from debtor’s perspective, influenced by the number of family members (it sounds silly, but logically it is so). From creditor’s point of view, it is, for instance, the last meaningful unit of savings that ensure his survival up to the nearest moment of debt maturity. Even if social rules enable, for example, less radical ways of debt recovery, release of such rules also has an impact on the frequency of debt exchanges in the community.

30 Within the meaning of my Theory of Interest and the article headlined “The Critique of Regression Theorem” (Pošvanc, 2017), it will be necessary to modify the assertions that M responds primarily to interest, as well as the claims related to time preference and spread influenced by social conventions and rules. M must reflect the complex of phenomena associated with debt exchange in time.
In this way, M gains use (calculating) value which can then be applied by human subjects to direct forms of exchange and pricing of other goods expressed in M. The use (calculating) value of M is thus derived from the universal exchange value of M. The calculation of the price of another good expressed in M in a particular time “t” must then be optimal. Optimal also means that the M good has gained its utility in a manner that is possible for exchanges voluntarily agreed in time in a particular community and under given circumstances. It means that optimal utility is ensured even if there are exchanges in the community that are perceived by human subjects ex post as incorrectly chosen strategies (direct vs. indirect) to meet their needs\(^{31}\).

**Need for Non-rigid Money Supply**

Since the assertion about the need for non-rigid M supply is a significantly different claim from those of the authors of the so-called restraining branch of the Austrian school, the best will be to illustrate the difference by way of an example. For example, Hoppe with Hülsmann and Block (hereinafter referred to as “H. with H.B.”) claim that (bold type was added):

“In individualistic terms, an increased demand for money is the result of the purposeful actions of individuals, that is people intent upon increasing their individual cash balances. **To do so, a person must restrict his purchases and/or increase his sales.** In either case, the outcome is an immediate fall of some prices. As the result of restricting one’s purchases of x, y, or z, the money price of x, y, or z will be lowered immediately (as compared with what it would have been otherwise), and likewise, by increasing one’s sales of a, b, or c their prices will fall instantly. No one is concerned about the general price level or the generalized purchasing power of money. Instead, everyone is always concerned about specific prices and the purchasing power of money regarding specific items (and everyone is interested in his very own and different specific array of prices and purchasing power). **In restricting his specific purchases and/or increasing his specific sales, each actor accomplishes exactly and immediately what he wants: certain prices that he deems too high are lowered, the purchasing power of a unit of money increases, the real value of his cash balance rises, and his demand for and supply of money is immediately brought back into equilibrium (and he wishes to hold neither more nor less money than he actually does)**\(^{32}\).

H. with H.B. explain (towards White, Selgin; here we need to admit that White, Selgin have no elaborated micro-approach to their claims about non-rigid money supply\(^{33}\)) the purchasing power of money through automatic perception of counter-exchange in the purchasing power of

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\(^{31}\) A non-optimal method is mutatis mutandis the way when there is a higher level of incorrectly estimated exchanges realised in a time continuum, i.e. the exchanges are perceived by human subjects ex post as incorrectly chosen strategies to meet their needs, and human subjects have been influenced to realise such exchanges during negotiations on this matter under intervention (political) conditions. I will deal with the topic and the problem in more detail in the forthcoming revised version of the Austrian Business Cycle Theory.

\(^{32}\) Hoppe, with Hülsmann and Block: *Against Fiduciary Media* [WWW DOCUMENT](https://mises.org/library/against-fiduciary-media-0)

money by the other subject in exchange. They claim that if human subject’s demand for money is higher, he does not need any extra monetary unit, because if he restricts his purchases or increases sales of his goods, he automatically changes their prices expressed in money, which automatically affects the perceived change in the purchasing power of money he wants to achieve. New money units are not needed. The assertions by H. with H.B. are based on the above-criticised objectivistic approach to the purchasing power of the M good. If we explicate the exchange through the objectified purchasing power of M, there is no real reason for more M units.

While H. with H.B. explain the change in the purchasing power of M in the context of changes in the prices of goods expressed in M, the interpretation given in this work clarifies the purchasing power of M as mediation of exchanging in a time continuum when the prices of goods are expressed in M as a result of this process. It is a qualitatively significant and far-reaching change in the description of M as a mediator of an indirect way of meeting human subjects’ needs in a time continuum. Let us look at such change.

As explained in the introduction, either H. with H.B. must inevitably attribute objectified purchasing power to M in time, or their explanation of the purchasing power of M clarifies nothing. By contrast, since this work describes exchange in time and calculation in time through interest which is a mathematical construct (function) we can use it in a time continuum. The point is that it is a mathematical construct. It has an identical and objective character in the past, today and tomorrow. H. with H.B. must attribute this character directly to M.

It is necessary to point out that I do not strive to achieve an identical amount of interest in time. It is identical mutual attribution of interest to exchange by two subjects in a time continuum. As we have shown, it is an identical process of categorisation of human subject’s mind. The fact that any other amount of interest is potentially assigned to consistent exchanges in time does not change in any way the possibility of comparing two – value-different – time periods. It is due to the fact that the value phenomenon of interest, which takes into account the currently perceived, potentially altered state of economic conditions, is incorporated in exchanges in various time periods. This way enables us to compare economic activities in time that necessarily have different conditions in respect of value changes perceived by human subjects. Figuratively speaking, we need to have the same equation in which we substitute unknown variables at different times for numbers corresponding to the current conditions of reality and based on this, we can compare two economic states – whether they have improved or worsened. The calculation of comparison of two periods is then possible, taking into account the current developments in the community.

As we have pointed out, interest is also a phenomenon of exchange. It cannot be attributed to human subject separately and does not relate to a particular good, but to a complex of options to meet the needs of two subjects in time, i.e. the portfolio of goods. It can only be attributed to a mutual activity – of at least two human subjects – in exchange. For human subjects, interest is a phenomenon by which they decide which exchange in a time continuum is suitable for them and which is not. Using interest, we consider the last possible exchange in terms of the possibility of reciprocal indirect satisfaction of human subjects’ needs mutually perceived by them in a time continuum and in the context of time preference. It is also true that human subject
with savings prefers earlier satisfaction of his needs for higher interest, where he makes the assessment in the context of a competitive choice from among multiple exchanges which will result in the earliest satisfaction of his needs in terms of the highest yield, and vice versa for human subject demanding the savings; their positions are identical. Therefore, it should not be confusing for the reader that human subjects do not apply interest in direct exchange. In that case, it is zero. This is because the exchange is realised with existing goods (immediate perception of satisfaction of needs) and also in time which is perceived by both human subjects as the present. Even at present, human subject always prefers relatively more to less. In time, the difference is only termed “interest”.

We do not apply the theory of marginal utility to the M good, but to the activity of exchange (indirect satisfaction of needs), when we express the exchange relationship (principal, interest, time preference, exchange conditions) through M in time. It is not a form of exemption in terms of the theory of marginal utility. Human subjects continue to apply the principle of marginal utility in the context of attributing use value to the goods that arise from the exchange, but in the context of exchange and exchange in a time continuum as a higher form of abstraction of the mind, they also apply the principle to the activity of exchange as such, i.e. an indirect way of meeting their needs.

By mediating exchange in a time continuum through interest, at the level of human subjects this activity creates a new form of need to which they respond by using the M good, i.e. interest is expressed in M. On the basis of expressing interest in M, human subjects attribute to M not only the universal exchange value, but also the abstract use value associated with the calculation of the exchange. The fact that M is mutually used by human subjects in the economic community means that the human subjects reflect through it the identical reaction of the mind to the exchange in a time continuum. M can thus be assigned the universal exchange value, as a consequence of which it gains an intersubjective utility nature through which exchange in time is calculated and the exchange as such is realised. A good acquires its utility-exchange character per se, thus serving as a universal medium of exchange, the ultimate eliminator of the debt (a debt accounting unit) in exchange in time, and therefore it is nobody’s IOU.

As I have already stated at the beginning of the article, the answer as to why gold has eventually become money is dependent on the overall extent of the spread of debt exchange (interest, time preference and debt exchange rules), which is thereby becoming narrower in competition with other goods people used as money. If it was not gold (for example, because we as the mankind would not strike it), it would be another good that would narrow the spread of debt exchange as the relatively second best one. Given that it is a reflection of activity, people can also use other methods of narrowing the spread to clear a debt associated with exchange in time, such as the institutionalisation of debt relationships in the form of a banking activity that mediates the mutual clearing of debt relationships between individuals as well as in a time continuum.

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34 It is a far-reaching and key piece of knowledge which we will describe in the next article aimed at revising the Austrian Business Cycle Theory. The problem confronting people is related to the fact that they attribute marginal utility to something, the result of which is unknown to them because it concerns the future.

35 The universality of exchange can then make an impression that the M good (no matter which people already use – salt, rei stones, livestock, fur, gold, silver, ...) has an objectively given exchange value in the context of people.
Interpersonal and temporal clearing can be made due to the possibility of abstract use of M. We will only assign an abstract rank to M on the value scale, thereby evaluate the goods which are the result of the economic activity by human subjects, and the results of which they owe to each other at present, but also in time, thus abstractly (or through some medium derived from M, i.e. money certificate or fiduciary media) settling the mutual debts.

People choose the objective properties of the M good so that it is uniform, durable, storable, divisible, or portable. These are objectively given properties affecting a relative reduction in the spread of exchange in a time continuum. The properties imply that the good can often be changed, it can be reused in exchange relationships. However, its optimal amount in circulation still remains important. It stems from the fact that using the good, we have to respond to the additional marginal exchange which is/is not to occur in the sense of proper interest reflection.

It means in other words that under certain social conditions of debt exchange, we have to discover (!) the amount of interest rate and the perception of time preference that will lead to the best possible indirect satisfaction of human subjects’ needs in time. And to do so, it is sometimes necessary to add an additional unit of the medium of exchange M, which ensures the optimal relationship between the creditor and the debtor in the context of proper reflection of debt exchange. It is also an identical problem human subjects deal with in relation to any other good that meets their needs.

Therefore, the difference between our interpretation and that of H. with H. B. should be obvious.

4. Conclusion

The introduced theory of intersubjective perception of value of money enables elimination of logical errors contained in the procedure based on the previous argumentation of some members of the Austrian School. The mechanism of evaluating goods – both monetary and non-monetary – is realised by a human being identically. Money as a good has no exceptional status in terms of perceiving its value. We have shown that human subjects assign both use value and exchange value to it. We also removed from our argumentation the so-called petitio principii error (arguing in circles) related to the explanation of the acquisition of the purchasing power of money. Given that we have linked a mental construct to a description of physiologic al processes going on in the mind, we ensured that the theory approximates to its apodictic validity if Hayek’s Theory of the Mind (in its essence and not in details) is correct.

36 For example, if the market is supplied with a new “excavator”, the marginal supplier and the buyer decide on the exchange, where satisfaction of their needs by such exchange must exceed other possibilities of satisfying the need which they respond to with the good “excavator”. It implies that the supply of a new excavator will be human subject to the assessment by a potential buyer of the possibility of satisfying the need, such as digging a hole, using another good (e.g. work, borrowing an excavator from someone who has it, or acquiring an excavator on debt, etc.). The purchase of the excavator must also override all other options. It also applies mutatis mutandis to money and meeting the need of potential exchange. It indicates that the supply of an additional unit of the M good must be the best solution in that case to mediate some kind of exchange in time. It means that if the social interest rate is perceived (entrepreneurially discovered) at the rate of X% and the holders of the existing good M push the amount of interest up to the rate of X+1%, the addition of a new unit of M is satisfactory, and vice versa, the supply of a new unit of M onto the market will be suspended if, for any reason, the owners of the already existing unit of M push the amount of interest down to the rate of X-1%. 

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The theory presented has a significant impact on several claims by some Austrian economists. In this work, we have shown that the amount of $M$ in a community is important and must be optimal, not unchanged. The theory has an impact on the Austrian theory's view of the fractional banking system, the issue of price optimisation, and will require a revision of the Austrian Business Cycle Theory.

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