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In defense of fractional free banking. Back to fundamentals

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Abstract: This paper examines the debate between the so-called fractionalists and the reservists within the Austrian School of Economics (1994 – 2005), emphasizing the maturity mismatch problem (2009 – 2019). It focuses on the fundamental arguments: the ontological view on currencies as banks' products (IOUs) and money, the purchasing power of money, and the maturity mismatch problem. Banking activity is seen as a vital evolutionary superstructure humans use to determine the marginal utilization of existing capital resources, effectively discovering the coincidence of money interest towards natural interest levels and time preferences within society. The thesis advocates the superiority of fractional and free banking over the reservist alternative. It shows that fractional free banking is not based on property rights violations, and does not cause systematic economic cycles beyond those related to natural business errors.

Keywords: Money, free banking, reserve banking, fractional banking.

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Em defesa do free banking fracionário. De volta aos fundamentos

Resumo: O artigo retoma a discussão austríaca entre os chamados fracionários e reservistas (1994 - 2005) e a discussão relacionada sobre o problema de correspondência incorreta de maturidade (2009 - 2019). A diferença do artigo está no enfoque nos argumentos fundamentais: visão ontológica sobre moedas como produtos bancários (IOUs) e dinheiro, a questão do poder de compra do dinheiro e o problema do descasamento de prazos. O artigo mostra a atividade bancária como uma superestrutura evolutiva vital que os humanos usam para descobrir a utilização marginal dos recursos de capital existentes. Afirma-se que a superestrutura bancária efetivamente descobre a coincidência dos juros monetários com os níveis naturais de juros e as preferências temporais da sociedade. A tese defende a superioridade do free banking fracionário sobre o reservista. Será mostrado que o free banking fracionário, em sua forma teórica, não é baseado em violações de direitos de propriedade e não causa ciclos econômicos de expansão e contração sistemáticos além daqueles relacionados a erros naturais de negócios.

Palavras-chave: dinheiro, livre mercado, dinheiro, sistema bancário fracional.

En defensa de free banking fraccionario. De regreso a los fundamentos

Resumen: El presente artículo retoma la discusión austríaca entre los llamados fraccionarios y reservistas (1994 - 2005) y la discusión relacionada al problema de correspondencia incorrecta de madurez (2009 - 2019). La diferencia del articulo está en el enfoque de los argumentos fundamentales: visión ontológica sobre monedas como productos bancarios (IOUs) y dinero, la cuestión del poder de compra del dinero y el problema del no emparejamiento de plazos. El articulo muestra la actividad bancaria como una superestructura en evolución vital que los humanos usan para descubrir la utilización marginal de los recursos de capital existentes. Se afirma que la superestructura bancaria efectivamente descubre la coincidencia de los intereses monetarios con los niveles naturales de los intereses y las preferencias temporales de la sociedad. La tesis defiende la superioridad del free banking fraccionario sobre el reservista. Verificaremos que el free banking fraccionario, en su forma teórica, no está basado en la violación de derechos de propiedad y no causa ciclos económicos de expansión y contracción sistemáticos además de aquellos relacionados a errores naturales de negocios.

Palabras clave: dinero, sistema bancario libre, sistema bancario de reserva, sistema bancario fraccional.

Introduction

The purpose of this paper is to show that the fractional free banking system is not a fraud and does not lead to a systemic boom-and-bust cycle. On the contrary, it is an evolutionary improvement of monetary, societal relationships. It analyzes the debate between the so-called fractionalists and reservists within the Austrian School of Economics. Among reservists, we take into account the proponents of a currency backed by precious metals – banks holding 100% reserves in precious metals. Among fractionalists, we consider the proponents of a currency partially backed by precious metals, i.e., anything less than 100% and more than 0%. The debate has a long history; however, it all starts with Hoppe (1994). Among other interesting papers covering this debate, we could cite De Soto (1995), Hülsmann (1996), Selgin and White (1996), Hoppe, with Hülsmann and Block (1998), Hülsmann (2000), Selgin (2000), Hülsmann (2003), White (2003), Hülsmann (2004), Cachanosky (2011). The paper also rejoins the discussion about maturity mismatch, covered by papers from Barnett and Block (2009 a;b), Bagus and Howden (2009), Bagus and Howden (2010), Bagus (2010), Davidson (2014), Block and Barnett (2015), Block and Barnett (2017), Bagus, Howden and Huerta de Soto (2018), Němec and Potužák (2019). There are many books, papers, and articles that coverthis topic, but are not possible to address here.

It is possible to claim that this work is not a traditional rejoinder to previous discussions. The goal of this study is to be included in the so-called fractionalists group. However, its dynamics follow a slightly different path. In our opinion, the problem the fractionalists face is explaining the need to add a marginal unit of commodity-money or currency unit in circulation. If fractionalists cannot explain the essence of this economic phenomenon, their approach to the problem is incorrect. Although fractionalists turn their attention to the problem of Wickell' 's natural interest (originary interest, in Mises'' terms), as seen in White (2014) or Selgin (2014), their argument about the necessity of a new monetary unit is still a macro-level argument. Fractionalists have never explained the alleged microeconomic demand for an additional monetary unit, related to the very complicated question of explaining purchasing power, that is, the price of money. Selgin and White (1996) consider themselves Misesians. However, it is impossible to explain the need for an additional monetary unit based on Mises'' regression theorem (MISES, 1953). Reservists, influenced by 'Mises' work on money, are, basically, more consistent than fractionalists. We claim that, if Mises is correct, reservists are logically and inevitably correct. Since fractionalists rely on Mises'' fundamental arguments about money, they are inconsistent in their arguments about the banking system. The only way they can bring consistency into their argumentation is to go back to fundamental level, abandoning Mises'' reasoning and building a new core theory. At first, it seems like a radical decision. However, as we will see, this is the only way to explain the microeconomic reasons for new money units, to bring full consistency into the arguments of fractionalists and to show the vitality of the banking sector.

This rejoinder to the debate is, therefore, slightly different. It is impossible to prevent the argumentative inconsistency of fractionalists based on the regression theorem, which, as will be shown, is objective. The only possible way is to separate fractionalists at this fundamental

level as well. Therefore, it is necessary to show other foundations for their argumentation, creating a comprehensive and coherent theory for fractional banking activity. In terms of fundamentals, this is not new economic knowledge. We will connect this theory to existing vital parts of the Austrian theory of subjective value. However, we will slightly modify some of its parts. This will enable us to define what natural (originary) interest is to explain the transition from a non-monetary economy to a monetary and, finally, to prove the vitality of the banking activity. We will show that commodity money is an evolutionary tool with which we began to express the natural interest level more precisely and to discover the monetary interest rate per se. Then, we derive the purchasing power (the price of money) from this ever-repeating process. Also, we will show that since the natural interest level can only be discovered by reflecting it in monetary terms, the banking system, and the fractional banking system, are vital evolutionary superstructures to this process. Of course, its functionality depends on the absence of political influence. In this way, we will introduce a coherence fractionalist theory based on consistent arguments. This paper shall include an answer to an implicit question asked by Hülsmann (2003, p. 30-33): Why a hundred percent system should be an inferior system?

This paper is lengthy, so it is a challenge to keep the reader's attention. So, we will start by defining the three fundamental problems at the root of the dispute. The first is the disagreement about whether or not the fractional system is fraudulent. The second, with an economic character, relates to whether the fractional system causes a systemic boom-and bust cycle. And the third, related to the second, is the so-called maturity mismatch problem. The paper is structured following this division.

In Part I, we will deal with the problem of fraud, by presenting an ontological view that will distinguish commodity money from the product of the banking sector in the form of bank currencies (IOUs). These ontological arguments slightly modify the nature of the ongoing debate. Distinguishing ontologically between money and currency brings a new perspective on the problem of fraud, and eliminates some related arguments in the form of "Ex nihilo" (or the double ownership) problem, and the argument concerning the collapse of the fractional banking system due to the "final" run on the banking system. Part I has a supportive character, and may be skipped if the reader does not consider fraud as a crucial problem to the debate.

However, Part II is crucial. It shows the background for the aforementioned problem of fractionalists not showing microeconomic reasons to add further monetary or currency units into the circulation. In this part, we present the main economic errors on which the reservists' arguments are based. Therefore, we will focus on the regression theorem problem in the explanation, showing the logical errors this concept faces. Awareness of these errors will lead to the conclusion that the Austrian school has not yet explained how commodity-money acquires its purchasing power. We will fix this problem. We will (i) show the characteristics of natural interest phenomena outside the monetary economy and the evolutionary transition from the non-monetary to the monetary economy; (ii) we will show that it is the discovery of the levels of natural interest, by the process of monetary reflection, that stands behind the

existence of the price of (commodity) money, i.e., the purchasing power of money; (iii) we will show that the process behind it is based on a more abstract level of mutual intersubjective structuring of economic phenomena in the economic community. In principle, we identify the same (abstract) need for each member of the economic community, which is satisfied by intersubjectively perceived goods - commodity money. Given that we identify the process of discovering the natural interest level in monetary form, the logical outcome of this argument is that specialized entrepreneurs (banks) improve the process.

Given that the argumentation is closely associated with the realization of debt exchange within the economic community (in a non-monetary or monetary one), the logically related area is the so-called maturity mismatch problem. Part III will focus on solving this problem in connection to Part II. In this section, we will point out the core of the problem - the difference between the individual provision of capital resources by creditors to the production process over time, which is planned by debtors, and the mediated provision of resources through banks. We will show the modus-operandi related to discovering some "social" time preferences through banking activities, which will be demonstrated within the reflection of the natural interest level.

In conclusion, the structure chosen will bring not only a new ontological view on the problem of fraud, but will also present different foundations, which in turn lead to coherent and consistent arguments showing the superiority of fractional free banking over the 100%-reserve one. Arguments will also demonstrate that the problems that banking systems experience today must be sought primarily within the scope of improper political interventions and not in the very nature of banking activities.

1. The problem of fraud

One of the biggest challenges in any discussion is a proper definition of terms. In our case, the question is: how do we define money? The discussion between reservists and fractionalists pointed out something important: the confusion in definitions. For example, Hoppe (1994) does not hesitate to put fiat money in the same basket as fiduciary media. As Selgin and White (1996, p. 85) point out:

> Hoppe tacitly redefines the category of fiat money to include banknotes and deposits, which are redeemable-on-demand claims to commodity money, so long as they are not backed 100 percent by reserves of commodity money [...] According to Misesian terminology, a fractionally-backed banknote that is indeed redeemable and recognized by the public as redeemable, is not an example of fiat money. Contrary to Hoppe's innovative phraseology, it is neither "fractional" fiat money nor "partial" fiat money. It is, instead, a fractionally or partially fiduciary medium.

Hoppe then points out discrepancies in definitions with Hülsmann and Block (1998, p. 21-22):

> As Hoppe posits, 'two individuals cannot be the exclusive owner of the same thing at the same time. '... In issuing and accepting a fiduciary note (at a necessarily discounted price),

> both bank and customer have, in fact, regardless of whatever they may believe or think about the transaction, agreed to represent themselves — fraudulently — as the owner of the same object at the same time. [...] Selgin and White do not recognize the fundamental praxeological difference between property and property titles. Rather, in subsuming money (gold) and money substitutes (banknotes) under the same heading of "money,' they obfuscate this very distinction. Because, if money (gold) and titles to money (banknotes) are both defined as "money," then it does not make any difference whether the supply of money or that of banknotes increases. Both are "money" and hence, by definition, in both cases the same event — an increase in the supply of money — has taken place.

Selgin (2000, p. 96) later explained:

> "... this novel fraud argument is based on a simple failure to recognize that redeemable banknotes and deposit credits are not "'titles"', as Hoppe and his co-authors claim. Instead, they are IOUs, so there is nothing inherently fraudulent about there being more of them in existence at any moment than the total stock of what they promise to deliver.

These quotes exemplify the confusion that we can 'clean up' by using an ontological approach. Ontology creates "a set of concepts and categories in a subject area or domain that shows their properties and the relations between them[1]." An ontological approach allows us to differentiate between distinct objects of reality based on an insight of their characteristics and the relationships between them. Therefore, the ontology of money is one of the potential routes to bring a certain degree of 'definitional order' into the discussion. Both reservists and fractionalists consider money to be gold (and, in this respect, whenever we talk about gold, we can also mean its twin – silver). There is no disagreement between them. However, using the term basic money implies that there is a more complex version of money. We can also use reservist quotes to correctly point out what we mean. Hoppe with Hülsmann and Block (1998, p. 25) define money as following:

> Money cannot but originate as a commodity, such as gold. Gold, then, as money, is defined as "the generally accepted medium of exchange," [...] In turn, money substitutes are defined as claims or titles to specified amounts of money (gold). If money substitutes (paper notes) are fully covered by reserves of money (gold), Mises calls them "money certificates," and we will refer to them here simply as money substitutes. If money substitutes (paper notes) are not covered by money (gold), they will be referred to as fiduciary media instead [...] (p.20). Referring to both money and money substitutes indiscriminately as money is to obscure the difference between two categorically and praxeologically distinct phenomena and states of affairs (p.23). [...] Titles to money are — and should be — backed by money in the same way and for the same reason as titles to cars are and should be backed by cars. This is what defines them as property titles.

However, the quote above implies that neither 'property titles' nor 'money substitutes' are money per se. As Hoppe with Hülsmann and Block (1998) exemplify, they are different objects of reality, i.e., they are property titles (!) to cars and real estate, not cars and real estate per se.

[1] Definition of ontology. Oxford dictionary. WWW DOCUMENT <https://en.oxforddictionaries.com/definition/ontology>

So, property titles to money are not money per se. From an ontological point of view, only one thing can be money. All other tools that we use in the financial world (money substitutes, fiduciary media, fiat money, money derivatives) must be, by definition, something else. It is as logical as not classifying airplanes or hang-gliders as birds, even though all three objects of reality can fly under certain circumstances. It is interesting that reservists notice the difference between these ontologically different objects of reality and point it out, as can be seen, from the following quotations: Hoppe with Hülsmann and Block (1998, p.24): "There are money (gold) and money substitutes (titles to money) in existence, and there are titles to non-money goods (equity titles) and titles to non-yet-existing future goods (debt claims)".

Hülsmann (1996, p. 6-7):

> It is different with money substitutes. They can only come into being as a claim, a part of a contract that fixes their exchange rate to money. They are signs, expressions for the disposition of a certain quantity of money. When they are exchanged for money, they are redeemed. Redeemability is the original meaning of the term convertibility. A document that is convertible in this sense can never have a value different than the object to which it gives claim. A convertible currency – money substitutes in the form of banknotes – can be neither money nor a standard. Only irredeemable notes are money – that is, fiat money. They are valued separately because they can be used independently from other goods. [...] In a system of free banking – whether on a fractional or a full-reserves basis – the demand deposits and banknotes of competing banks are substitutes. They represent a convenient means of documenting claims on money.

> This shows that intrinsically worthless pieces of paper can acquire purchasing power. If and insofar as they represent an unconditional claim to money and are valid and redeemable at any time, paper tickets are bought and sold as if they were genuine money, being traded against money at par. Once they (money substitutes) have acquired purchasing power and then are deprived of their character as claims to money (by somehow suspending redeemability), they may continue functioning as Money. (HOPPE, 1994, p. 56)

If we consider money to be gold, and the banking system does not produce gold, a question arises: "What does a full-reserves banking system or a fractional banking system create?" This question is fundamental to the discussion of reservists and fractionalists, and it requires an ontological answer. It is interesting that both camps answer this question correctly, in principle, but inaccurately, and it is precisely this inaccuracy that creates the definitional confusion in both camps. They claim that the system they prefer does not create money per se, but it creates money substitutes (see above quotations 6, 7, and 8) or fiduciary media[2]. From the quotes, we can see that both camps talk about different objects of reality, but they do not approach them with enough precision as different objects of reality. If they are different objects of reality, we are dealing not with a precise substitution of money, but rather with a substitution of the characteristics we attribute to money**.** It is then impossible to claim that

[2] See, e.g., Selgin (1998, p. 22) Selgin writes: „Of even greater significance than Ruritania's one-time savings from *fiduciary substitution (the replacement of commodity money with unbacked inside money)* is its continuing gain from using additional issues of fiduciary media to meet increased demands for money balances. (italic added by author).

these objects of reality created in the banking system have identical characteristics to money – if they did, they would be money[3]. The difference does not stem only from defining their different appearance, creation, or physical nature, but also from how they gain their value. Therefore, we can claim about these different objects of reality react similarly to the economic problem that money solves (later, we will show how and why). It is similar to the bird, plane, and hang glider example: each of them has different characteristic attributes, but they can all fly under different circumstances. It is essential to realize that this is not a trivial detail.

We show the reservists' inconsistency on this point with two quotations: Hoppe's (quotation 8) and Hülsmann's (quotation 7). We consider Hoppe's claim to be correct, and Hülsmann's to be incorrect. For Hoppe's description (quotation 8) to be correct, he used a conditional "if and insofar no doubts exist". Because Hülsmann did not use the condition of feasibility, his claim is not valid, although he explicitly realizes that the creation of new objects of reality comes into being as an obligation. His claim would be valid only if no doubt exists about the quality of the substitute (claims) for money emitted by a third party. The valuation of these objects of reality does not depend on the underlying asset (money per se; which follows from Hülsmann's quotation), but also on the trustworthiness of the third party and the general belief that it will fulfill its obligation; i.e., if and while there is no doubt about the full-reserve bank behaving as it says it does. If and while also indicates that the valuation of an object of reality created by the banking system (in the reservists' case, by a bank with 100 percent reserves), i.e., the money substitute, depends on different socio-economic relationships than the valuation of money itself does. In the case of a third party, for example, it depends on the trust that the bank will fulfill its obligation; on its credit activity, on its business plan, the value stability of its portfolio, its reputation or history.

Unfortunately, fractionalists are also inconsistent. Selgin and White (1996) emphasize the necessity of a third party's trustworthiness. They bring attention to the fact that fractional banks are not trying to hide their lower reserves, or that declaring higher reserves than the bank has is a form of fraud. Since they do not approach fiduciary media unambiguously as different objects of reality to money, their argumentation is confusing:

Selgin and White (1996, p. 87):

> The demandability of a particular claim issued by a bank, i.e., the holder's contractual option to redeem it at any time, is not per se a representation that the bank is holding 100 percent reserves against the total of its demandable claims.

Rothbard (1990, p. 49-50) argues otherwise, based on the view that a bank's demand deposits and notes are necessarily 'warehouse receipt' and not debts. We do not see why bank and customer cannot contractually agree to make them debts and not warehouse receipts, and we believe that historically they have so agreed.

The last sentence implies that they consider the object of reality' warehouse receipt' for an (interchangeable) substitute for money. At the same time, they say that bank and

[3] They would, for example, be objects of reality that are indifferent to the banking sector and would not be anyone's IOUs.

client can voluntarily transform this money substitute into debt obligation – ergo a different phenomenon of reality. Although the criticism raised by Hoppe with Hülsmann and Block (1998, p. 30-31) is legitimate in this context[4], it is irrelevant in terms of an ontology of money. Moreover, it seems that Selgin and White (1996) did not explicitly say they are dealing with different objects of reality, i.e., with obligations per se. Once the client consents to cooperate with any bank, he demonstrates that he is prepared to use other objects of reality (a bank obligation) instead of commodity-money. Selgin and White's (1996) argumentation is correct in terms of consequences; as we have shown earlier, a 'warehouse receipt' is considered a kind of debt, which is a form of obligation. Therefore, a receipt (claim) and a currency (fiduciary media) are objects of reality with identical characteristics to those of an obligation. That is why a bank and its clients can consider it an obligation (debt). Had they explicitly recognized these differences, their argumentation would be consistent. It is true that both bank and client voluntarily perceive the given object of reality as an obligation of the bank to the client, and that is what was happening historically. The claim that "We do not see why bank and customer cannot contractually agree to make them debts" is, therefore, confusing. Ontologically, it is a done deal, once the client deposits commodity-money (gold) into the bank and consents to use the bank's IOU and not money per se, it becomes a liability for the bank[5].

Furthermore, as we can see from how the discussion between fractionalists and reservists evolved, Selgin (2000) explicitly stated that the banking system creates IOUs – see quotation 4. The same was stated later by Hülsmann (2000, p.108 **[bold added]**), who writes in the context of his requirements for what he calls 'honest fractional banking':

> Fractional reserve banks **would have to use a different language** than they commonly use, because words such as "deposit" are deceptive. They would have to make it clear that money "deposited" with them is, in fact, a credit of unspecified duration. And the "banknotes" they issue would have to be presented not as money titles but as some sort of very liquid IOUs.

Ontologically speaking, what the banking system creates is IOUs (I Owe You) – obligations. A third party – the banking system – enters the relationships of banks' clients. The form of these obligations and their legal and financial characteristics can vary and take the form of titles to money, equity title, and debt/credit. (See quotation 6 and consider the variety of today's financial derivatives as an example). Even with a **reservist** understanding of the

[4] A similarly valid criticism as the exchange of a warehouse receipt is the one of Hoppe with Hülsmann and Block (1998) about the problem of "proof from existence". Selgin and White (1996) defend the fractional system in this way, stating that the fact that it existed historically proves its usefulness. The criticism takes Selgin and White's argument out of context (1996), but it is valid. However, we will show that it is irrelevant, providing a different economic-logical argument for the defensibility of the fractional system.

[5] If the client posts the IOU to assets side of his balance sheet, the bank posts commodity-money (gold) to the assets side, and the IOUs to the liabilities side of its balance sheet. If a fractional bank decreases the percentual composition of gold-reserves, it means that some other client consent with the bank to a credit operation to finance his business. So, client posts to his balance sheet the IOU to assets side. He creates debt (some business) and posts it to the liabilities side of his balance sheet and bank posts (financial) security as a claim to clients business to the asset side and creates IOU which it posts to the liability side. The operation causes the character of the assets side of the bank to have a lower percentage of commodity-money (gold).

banking system, banks create IOUs. A receipt for deposited commodity-money (gold) is not the same object of reality as commodity-money (gold) per se[6]. Ontologically speaking, full-reserves banks create a (clearable and tradeable) obligation against an underlying asset with a particular form of gold, and a bank holds a 100% reserve of the underlying asset - gold. Simultaneously, it only lends that commodity-money (gold deposits) with the permission of the client. From an ontological point of view, we should differentiate between a bank and a custodian bank or gold warehouse. Even in a **fractional system**, banks do not create money-commodity per se. They create "fiduciary media" or "fiduciary currency" which is, from an ontological perspective, also a type of obligation (in a fractional system, a clearing bank records the fiduciary media on bank's liabilities). 'Fiduciary media' is a type of currency. Ontologically, it is a tradable obligation whose value derives from an underlying receivable (a tradable type of asset on the balance sheet of the bank), while the fractional bank's obligations are (generally and not specifically) are also "backed" by some reserves in the form of a commodity-money (e.g., precious metals), which the issuer holds at a rate of 99.xy% to 0.xy% as base money-reserves. Money (gold) will be used for a final elimination of any relationship between bank and client if the client refuses to use the issuer's currency or currency from a different issuer in the banking system[7]. Basically, the client would take gold and leave the banking system. Both a 100-percent and a fractional system are identical from an ontological point of view as far as creating IOUs is concerned. The difference lies in what is and what is not an underlying asset, or a part of the underlying assets. It is valid to ponder whether or not to use the term property clearing title/clearing claim for both systems, since that term defines the character of the obligation in question.

In the question of fraud, the ontological approach favors the fractionalists. The argument of fraud, where the reservists claim that lowering the level of reserves held by a bank in base-commodity-money (gold) is a fraudulent act, has to fall short necessarily. Reservists Hoppe with Hülsmann and Block (1998, p. 22) claim "In issuing and accepting a fiduciary note (at a necessarily discounted price), both bank and customer have, regardless of whatever they may believe or think about the transaction, agreed to represent themselves — fraudulently — as the owner of the same object at the same time".

[6] White (2003, p. 425) points out that, because we are dealing with certificates of gold (money) deposits into a warehouse for a fee, their tradability is limited because of the problem of receiving the fee from the owner of a given certificate. If the certificate were used as currency and changed owners often, the warehouse would face a problem when asking for the fee to be paid. This argument has more of a technical character and is not necessarily unsolvable (see, for example, today's system of the Goldmoney company). That is why we would consider it superfluous in this day and technological age, and would only use it as a supportive argument to the historical evolution of banking towards a fractional system.

[7] The final eliminator of debt within the free banking system would be commodity money. The fiat money system is different: in it, debt can only be eliminated with a new debt, which finances more productive economic activity. If it finances less efficient economic activity, the fiat-system must be exposed to a loss of purchasing power of fiat-money (currencies, IOUs). The final elimination of debt in the fiduciary-media system is possible through commodity money, which forms part of the bank's reserves. The client then obtains commodity money, which has lower liquidity than fiduciary-media, but higher liquidity than other types of (financial) assets. At the same time, commodity money does not carry any debt. They are not IOUs. They are a liquid asset per se, which is created at an inter-individual level of humans' relationships compare to bank´s currencies. It is explicitly impossible to agree with Hülsmann (1996, p. 7), who says the following about 'fiat money': "Only irredeemable notes are money-that is, fiat money. They are valued separately because they can be used independently from other goods."Fiat money gains its valuation in a way identical to any other IOU in the banking system.

Given that we are dealing with an object of reality in the form of an obligation (not commodity-money per se) both in the reservist and the fractionalist systems, the argument of fraud is not applicable as long as the bank correctly and without fraudulent intent declares the level of its reserves. Hoppe with Hülsmann and Block (1998) also fail on their critique of how Selgin and White (1996) use the Rothbardian theory of contractual relationships. Criticism focused on the fact that a voluntary contract must be preceded by the existence of an ownership claim to the exchanged good is, of course, valid. Although it does not apply to the banking system, since it generates tradable obligations against tradable assets – it does not substitute commodity-money per se. There is no logical, economic, or legal necessity implying any debtor cannot eliminate his obligation to the creditor through something other than commodity-money (gold) per se. The banking sector does not produce money. It provides, among other services, the effective clearing of debt (over time and among clients).

Moreover, no necessity dictates that a creditor cannot accept this offer of elimination of an obligation. The fact that clients of a bank that correctly informs about commodity-money reserves voluntarily accept a lowering of the bank's commodity-money reserves (gold), does not mean anything else than that they voluntarily engage in a model of potential elimination of the bank's obligations in a form different than commodity-money. This process can take the form of the issuer's currency, or the currency of other issuers; clearing title/s that the fractional bank/banking system generates against various tradable assets in the present time and more extensive time continuum (we will describe the economic side of the problem over time later). Suppose clients do not withdraw commodity-money (gold) but use currencies instead. In that case, it is nothing more than a demonstration that they are satisfied with the banking sector's reserves (which should be correctly recorded). In a fractional system, commodity-money (gold) only serves for the final elimination of any relationships between clients and banks. Which means, for the client, that he takes gold and leaves the banking sector; by withdrawing gold, the client declares indifference to the banking system, and he does so with all the consequences that stem from that (zero interest, problem of storing money – gold, lower liquidity of money, and so on)[8].

1.1. Double ownership

In connection to the problem of the double ownership of money, Huerta de Soto (1995) claims that any fractional system must necessarily go bankrupt because of its inability to insure against the risk of gold withdrawal (of fractional reserves). According to de Soto (1995), fractional banks would spend a portion of their time doing business on monitoring the probability of gold being withdrawn from the bank and estimate, based on that, its level of reserves. To the reservists, this means that banks are unable to fulfill their obligation if every client should request to withdraw gold. They also claim that, because fractional banks

[8] At the same time, this is a very crucial economic phenomenon of any free banking system. Considering the positive attributes of the indifference of the object of reality called 'money' (gold) to the financial system itself, the indifference is caused by the fact that gold is a different object of reality. Compared to currency it is created differently, gold has defined conditions for market entry, and gains its value differently from the IOUs of the banking system.

used a so-called option clause (a choice to delay requested withdrawal of gold) in the past, they explicitly declare that banks are committing fraud. The argument about the monitoring of gold reserves is correct. Any bank is interested to see what it has on the books. However, this is not the question of moral hazard. Huerta de Soto (1995, p.30) writes about the inability to apply insurance mathematics and moral hazard: "… all insurance theorists know, the consequences of an event (untypical withdrawal of deposits) which is not totally independent of the "insurance itself (fractional reserve) are not technically insurable, for reasons of moral hazard".

For this argument to work, however, the reservists depend on of an en masse event. De Soto (1995) claims that it is the inability to insure against this event that would create a mass possibility of a general trust crisis, affecting negatively the trustworthiness not only of fractional banks, but also of every other fractional bank, i.e., the whole banking system. Moreover, this will happen if all clients demand commodity-money (gold) at the same time. Logically, some will not receive gold. In their defense of the fractional system, Selgin and White (1996) use only empirical arguments about how the banks operated in the past, surviving with fractional reserves, while using the option clause system[9] to protect themselves against such events.

However, we need logical arguments, not empirical ones, to support the fractional system. The problem lies somewhere else. Huerta de Soto's presumption about a free fractional baking system is illogical. Remember the ontological fact that the banking system does not generate commodity-money or its substitutes per se, but rather IOUs, which clients use voluntarily. Fractional banks do not create new commodity-money. They decrease commodity-money reserves and create new IOUs, which are "backed" by other financial instruments (securities) with diverse liquidity and solvency. Since banks create IOUs, banks and the banking system in general do not face only the risk of withdrawal of commodity-money (gold) from the system; and the one-bank issue is not as relevant as it seems[10].

Banks do, however, face a (systemic) risk that clients will question the solvency of financial assets on the bank's books. They might not be willing to accept fiduciary media of an issuer/bank whose financial assets have questionable solvency[11]. Commodity-money (gold) withdrawal is the least of any fractional bank´s problems. Let us clarify what we mean. The possibility of withdrawing gold is a positive feature of the fractional banking system. Clients have the power to force banks to perform sound banking. However, fractional banks with sound legal conditions normally don't face a problem with commodity-money

[9] See in more detail Selgin and White (1996, p. 89 – 92)

[10] The withdrawal of gold from the bank or banking system is actually a consequence, not a prerequisite, of the problem in question. Gold withdrawal is caused by the fact that a bank or more banks together lose their entrepreneurship credibility. However, this is not due to the withdrawal of gold from the bank, but because of entrepreneurial mistakes concerning credit relations. Withdrawal of gold is the next step.

[11] The creation of 'deposits' is simply described in McLeay, M. Radia, A. Thoma, R. (2014). Currency deposits in the banking system are created through the granting of credit, not the other way around. It is a fundamental difference in the understanding of how the banking system functions from the point of view of Austrian economists. What can be criticized about this description, from an ontological point of view, is that we are not dealing with deposits, but with clearing titles. The term 'deposit' confuses the argument because it indicates a deposit of commodity-money (gold) into the banking system.

withdrawal. Sound bank IOUs have much more liquidity then commodity-money. That is why, for example, clients use bank services instead of using gold directly. People do not demand commodity-money (gold) per se, but liquidity, which can be insured in many ways. Gold is one (non-bank) way to have liquidity, but banks ensure liquidity in more efficient ways. If clients want commodity-money (gold), they will not use banking services. They will use gold directly. This argument has to change the optics of reservists' argumentation. Clients, other than withdrawing money (gold), also have the option to apply a value discount on the currency of the issuer in trouble. Moreover, in the case of bankruptcy, they will be repaid by selling the unsound bank's financial assets (while applying the value discount on the issuer's currency) for the currency of the sound issuer. The option of the (discount) exchange of an unsound IOU (the currency of a insolvent bank) for a sound IOU (the currency of a sound bank) necessarily disrupts Huerta de Soto's argument. This is because the banking system is not about utilizing insurance mathematics to determine the probability of gold withdrawal from a particular bank. It is all about building a sound portfolio, using financial mathematics to judge the economically successful/unsuccessful portfolios of banks or the whole banking system. Therefore, there is no logical reason for the bankruptcy of a single bank to cause the inevitable bankruptcy of other fractional banks, or the systemic bankruptcy of the whole free banking system. Again, people do not demand gold. They demand (sound) liquidity, which is ensured by solvent banks, whose solvency is ensured in the free market by competition. The idea of systemic (en masse) bankruptcy is also based on an incorrect assumption that (all) banks always, and under any circumstances, act as a fraudulent cartel, or to the detriment of their clients. This is an empirical assumption, not a logical argument. The historical experiences of banks acting more to the benefit of political power, or banks demanding privileges if they get into trouble, are not particular to this economic sector of society, and at the same time, it is not a logical proof of the impossibility of a functional free fractional system[12]. We can apply the same argument in an identical way to the 100-percent banking system as well. Furthermore, these historical experiences are usually related to hampered markets.

1.2. Ex nihilo argument

Another superfluous counter-argument is the problem of creating a supply of money ex nihilo. It is a superfluous problem due to an ontological failure to differentiate between commodity-money (gold) and IOUs. The growth and decrease of what we (incorrectly, from an

[12] Some authors might object that, from a historical point of view, the creation of the fractional banking system is a fraud. It is necessary to clarify that the purpose of this work is not to historically evaluate this claim, but to logically argue whether a fractional system is logically possible, besides legally and economically viable. In my view, Selgin and White sufficiently prove that, even from a historical point of view, it was not a fraud, and as long as the system wasn't unnecessarily regulated, it was proven to be economic resilient. Objections from some reservists (see e.g. Hülsmann 2004), pointing out the historical preference for fractional systems by judicial and political authorities can challenge the examination given and raise questions; identically, it is possible to use de Soto's historical method, in which he bases his arguments, for example, on judicative of Roman law, or the European continental legal tradition. For a logical argumentation, however, these empirical procedures are irrelevant, because they are a part of a historical method of inquiry. It is also necessary to point out that reservists themselves, concerning the practical implementation of their theory, suggest drawing a 'thick line' after the past and focus on practical solutions to organize social relationships in the future (KINSELLA, 2014). Simply put, this means that the past is in the past. It is forever gone, and it is necessary to look into the future.

ontological point of view) call money supply the growth and decrease of the banking system IOUs. Yes, banks create an IOU ex nihilo, but an obligation or liability is, by its very nature, always created ex nihilo. The ex nihilo problem is, therefore, an empty argument. It is like saying that I am getting older and will eventually die; yes, it is how it works. Suppose Alice takes her hoe and helps Bob till the soil in the spring, while Bob, in exchange, offers her apples that will grow in the autumn - we see an obligation created ex nihilo, but in the context of Bob's promise to supply the apples. If recorded in some distributable form (e.g., on paper), it can be used, for example within a community, for the mutual recognition of debts in related and unrelated exchanges (basically, what we call fiat money has been created).

Often missed in describing the problem of creating currency supply ex nihilo is that we deal with an obligation created against a receivable. By definition, there is no multiplication of deposits or the creation of new money (gold). The fractional banking system "creates" currencies by decreasing commodity-money reserves, adding different assets than commodity-money to the balance sheet of the bank. These activities accompany the creation of currency. We have the balance sheet of a debtor and the balance sheet of a bank. A debtor creates debt, and "puts" it on the liability side of their balance sheet in the form of a security or a bond. The bank "puts" this security or bond on the asset side of its balance sheet, creating a liability in the form of currency that is deposited on the bank account of the debtor in this bank (or another bank). There is a change to the profile of the bank's assets. After the fact, we see a decrease in the rate of gold reserves. The currency funds some economic activity, e.g. to build a factory. So, the debtor takes currency to acquire capital goods (such as a bagger or bricks), or consumer goods (such as food for workers), which are necessary to build the factory. That is why currencies (IOUs) issued in the past to facilitate the creation of existing baggers, bricks or food disappear from the banking system. It means that older securities or bonds are paid by debtors, and erased from the bank´s and the debtor´s balance sheet. Financing some economic activity is a never-ending economic process (e.g. building of a factory), because the currency (IOU) created today will be eliminated in the future, when the debtor (owner of the factory) will sell the products made possible by the financed factory. The ex nihilo problem does exist even in the fiat money system, where the same thing happens in principle (an obligation is created against a receivable), but without reserves in the form of money (gold)[13]. As problematic ex nihilo creation, we can consider only some central bank activities related to the socialization of debt. By this we mean the political intervention of the central bank in favor of a debtor unable to repay its debt[14]. In other words, problematic ex nihilo activities of central banks happen when they buy, e.g., government bonds, and the government has no intention to repay them, or repays them by issuing new bonds it buys itself. This is the only

[13] This claim is not entirely definitive, because some central banks still hold gold on their books today. The currency they generate, recording on the liabilities side is, therefore, also backed against gold-assets. However, today it is impossible to make a run on gold held by central banks. Thus, gold remains in the monetary system, but it is not even possible to say today that the currency is issued against gold. It is some kind of a "limbo state", quite usual in the political system.

[14] The "socialization of debt" is an intervention concerning the solvency of the debtor, and it should be distinguished with liquidity interventions. We could say that there are some grey zones where the political interventions to "save" debtors in distress could be accepted by general public as a trade-off, like the bankruptcy of this debtor.

example of problematic ex nihilo creation, the straightforward counterfeiting of credit or liabilities of the banking system, where IOUs (liabilities) are created against some asset with no (or hugely discounted) economic value[15].

2. The problem of a systemic boom-bust cycle

The reservists themselves relatively move away[16] from arguing whether or not the fractional system is fraudulent. What remains is a crucial argument used to defend the full-reserve banking system – that any increase of fiduciary media causes economic distortions in the form of a boom-bust cycle, and also an unnatural redistribution of economic resources. This phenomenon is described by the Austrian Business Cycle Theory (ABCT). The reservists, based on the ABCT, argue that a systemic boom-bust cycle is a result of the following two basic combinations:

A. a societally anticipated increase of the money supply (the argument applies to both gold and currency[17]) and the creation of new money by fractional banks against reserves lower than 100 percent create an economically ineffective redistribution of wealth. With the addition of a marginal monetary unit, entrepreneurs incorporate the planned increase of the money supply into their plans. The market interest rate increases anticipating higher prices. However, the market mechanism loses efficiency because some members of the community gain access to and benefit from the new money earlier
B. A socially unanticipated increase of the money supply, i.e., more new money whose creation we did not anticipate, will cause an artificial lowering of the interest rate, i.e., a change in the societal rate of time preference. These things influence existing savings and consumption; that is, economic subjects change their preferences concerning current and future consumption. An artificially lowered interest rate causes entrepreneurs to extend the production structure artificially and increase the consumption of resources. A boom occurs. Since the production structure did not correspond to the societal rate of time preference, and a higher investment did not correspond to a higher rate of societal savings, resources were misallocated. This misallocation will generate systemic inefficiency of the new business projects and, subsequently, their bankruptcy. An economic bust must necessarily follow an economic boom.

[15] It cannot be surprising that we see hyper-inflation events in political banking systems connected usually with some political activities, when an asset, e.g., government bond, has no value, i.e., nobody believes that it will be paid with real economic value or when government fails to be solvent. The end of the hyperinflation is connected with very opposite policy (SARGENT, 1981).

[16] Salerno (2010).

[17] This argument also applies to gold itself. From this point of view, gold is acceptable by the reservists because its increase in quantity in an economic community is relatively low – and if we adjust for the costs of mining, they consider its supply to be almost rigid. An ideal commodity that can be used is Bitcoin – a rigid internet commodity, decentralized distributed database, a computer program. We expand on the problem of Bitcoin in the appendix.

By definition, any increase of the money or fiduciary/fiat currency (hereinafter referred to as the M) supply has to either dilute the purchasing power of M (an anticipated increase of M's supply) or artificially lower the interest rate (a non-anticipated increase of M's supply). Both IOUs of a fractional banking system and money itself in the form of gold, should be problematic for consistent reservists. Even to Mises, gold is only a 'minor evil' (1998, p. 419). Based on the ABCT, the reservists criticize the new units of M. Whether we are talking about gold or IOUs of a fractional banking system, new units are added to the economic system. Every commodity-good was problematic for a consistent reservist argumentation about M until the invention of Bitcoin in 2009, whose supply is finite.

On the other hand, the fractionalists claim that new money and new currencies (IOUs) react to a so-called problem of money shortage, which the economic system uses to balance a monetary disequilibrium. The reservists' criticism towards fractionalists, in the context of demand for new M-units, is twofold. First, it addresses the problem of disequilibrium related to changes in demand for M, which, for the fractionalists, cause a misallocation of resources. First, let us look at what the fractionalists Selgin and White (1996, p. 100-101) said about this topic:

1. "In the long run, nominal prices will adjust to equate supply and demand for money balances, whatever the nominal quantity of money. However, it does not follow that each and every change in the supply of or demand for money will automatically lead to a new long-run equilibrium, because price adjustments take time. They take time because not all agents are instantly and perfectly aware of changes in the money stock or (money) demand, and because some prices are costly to adjust and, therefore, "sticky." It follows that in the short-run (empirically, think "for a number of months"), less than fully anticipated changes to the supply of or demand for money can give rise to monetary disequilibrium. It is, therefore, an attractive feature of free banking with fractional reserves that the nominal quantity of bank-issued money tends to adjust to offset changes in the velocity of money."

Reservists dispute price disequilibrium and misallocation of resources. According to them, there is no reason to differentiate between short-term and long-term disequilibria. They claim that new money is not necessary, since money prices will immediately adapt (through agents' action) based on the supply and demand of goods. In the context of individuals, higher demand for money is supposedly related to an increase in their monetary balances, as well as a decrease in the number of goods bought or an increase in the number of goods sold. Nevertheless, these (increases or decreases) are connected to changes in the prices of goods in the market. Reservists claim that an individual does not care about the general price level, nor the general purchasing power of money (fractional argument). On the contrary, they do care about specific prices and the purchasing power of their own money, given that money is used to purchase goods (money is not consumable). From the reservist perspective, an agent's action related to either restricted purchasing or increased sales, and to the anticipation of the addition of new monetary units into the system, affects the perceived increase/decrease of

the purchasing power of their monetary balances, meaning that the rate of an individual's monetary balances always leads to an equilibrium. The demand for money must also be sufficient, i.e., affected either by the restriction of purchasing certain goods or increasing the sales of the goods provided by the individual. The reason is that Say's law applies – all goods are bought for other goods; no one can demand something without also supplying something. However, emitting a new unit of M is not an instance of this law.

The second problem relates to the fact that adding a new M unit created against an unchanged number of resources can not cause either an increase or a decrease in the number of resources. Selgin and White (1996) agree with the reservists and claim that time preference and demand for money are not related, that a change in one does not imply a change in the other. However, this would mean that new money has no relation to the growth of savings and, therefore, with new resources that can be used to create new capital structures. Selgin and White (1996) try to evade this argument by claiming that holding money implies its later spending, i.e., holding money delays consumption. Hoppe, with Hülsmann, Block (1998, p. 43) reply as follows:

2. "Selgin and White try to escape from this conclusion by an ad hoc semantic shift, that is, characterizing money as a future good. Essentially, they argue that, while increased money demand does not imply increased savings, it does provide for a larger loan fund, since money is held only to be spent "sometime in the future" (their emphasis). So, an increased demand for money is always, and at the same time, an increase in the demand for future goods. "

Unlike Selgin and White, the reservists correctly state that money is not a future good. It is a present good whose role is to mitigate uncertainty (not risk) in subjects' actions – money, being the most tradable good (with the highest liquidity), allows humans to best react to an uncertain future. In other words, human subjects do not need to know their future needs. It is sufficient to have money whose highest liquidity rate will ensure that their needs will be satisfied. Hoppe, with Hülsmann and Block (1998, p. 46) then write:

3. "Accordingly, to the extent that he feels certain regarding his future, a man will want to invest in consumer and producer goods. Only to the extent that he feels uncertain about his future will he want to make the sacrifice Mises refers (to), that is, he will want to invest to relieve any uncertainty of his future consumption-production (income-expenditure) pattern. Hence, rather than indicating his increased willingness to sacrifice present satisfaction in exchange for future satisfaction, an increased demand for money demonstrates a man's more intense uncertainty regarding his future. Rather than being an investment in the future, adding to his cash balance represents an investment in present certainty (protection) vis-à-vis a future perceived as less certain."

According to the reservists, the disequilibrium Selgin and White (1996) write about is a natural state in which individuals demonstrate a higher rate of uncertainty related to the future. Adding new money (gold) or units of currency is, then, necessarily distortionary. In a footnote, Hoppe, with Hülsmann and Block (1998, p. 46) also add that, in principle, Selgin and White "never answered the question of why the demand for money changes, which means, in principle, that they do not explain (microeconomically) the change in individual subjective valuation of changes related to uncertainty about the future faced by individuals." This last criticism, which the reservists placed into a footnote, is key, in our opinion. Selgin and White's explanation indeed omits the microeconomic – individual – side of the whole problem. Does it mean that reservists are correct? We do not think so.

We claim that the reservists' interpretation of the ABCT above is only possible based on the fact that their argumentation uses a presupposition of objectivization of the objective exchange value of money, which depends on the price of money and also an incorrect approach to interest rates[18]. Mises writes that money has a "certain objective exchange value." The same is claimed by Rothbard[19] and implied by other authors (not only within the Austrian School's reservist branch). The fractionalists accept this assumption (see e.g. the debate in White (2014)); and, as we shall see, it causes shortcomings in their argument. This status of the objective exchange value of money, which depends on the price of money, supposedly stems from the fact that money is a good that enters into every indirect. Austrian authors (in general) talk about a 'certain' objective exchange value. Supposedly, this stems from the fact that the valuation of money and people's anticipation of its purchasing power only depends on the amount of money, i.e., the amount of gold, money substitutes, or fiduciary media (our M).

M's price is, therefore, clearly objectivized over time. We can say that money is value-invariant over time unless the supply remains the same. However, every other economic good is priced based on its supply and demand derived from humans' valuations. The reservists' explanation, however, implies the opposite for money. Money has the purchasing power (the price) per se; the price and the objective exchange value are presupposed or given as a matter of fact. The outcome of the subjective valuations of agents - the price - is the prerequisite here. So, the line of reasoning of the theory of subjective value as man valuation, then part of the exchange and outcome of it as the price ratio of two commodities is the opposite. This is because the subjective use value and the subjective exchange value of money coincide, and derive from the objective exchange value of money (MISES, 1953, p. 97). Allegedly, the subjective valuation derives from the price of money. In the words of Mises (1953, p. 97-98): "It is impossible to conceive of any function of money, qua money, that can be separated from the fact of its objective exchange value". Only a new supply of a unit of M causes distortion

[18] The reservists grasped the problem of interest as a problem related to the issue of time preferences. For a critique of this approach, see, e.g., in Hülsmann (2000), Murphy (2003), Potužák (2016), Posvanc (2020a)

[19] Rothbard (2004, p.765): "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."

and change of its purchasing power. If the reader considers this explanation elusive, he is on the right track[20]. In principle, the Austrian authors claim that money is the only good whose valuation is not influenced directly by the law of diminishing marginal utility or that, in the case of M, it applies only to the number of M units - what we are able to buy with M. Therefore, M has its value and price per se. Its value and price are derived from the agents' valuation, based on the number of units of M and the description of how M has gained its value. Mises explains the origins of the money phenomenon through the so-called regression theorem. We will approach it in a moment.

Based on this, we explicitly claim the objective presupposition that the purchasing power of M decreases by adding a new unit of M to the monetary supply, i.e., new gold/new unit of currency that is not 100% backed by gold,. This must, of course, cause the redistribution of economic resources from those who gain access to M later to those who gain access to M earlier. On the other hand, a non-anticipated increase in M will lead to an artificial change to the interest rate level. Within the Misesian system, this claim is possible because the interest rate represents a premium related to postponing the consumption or utilization of capital goods. This stems from the fact that the interest rate is derived from time preference. A new, non-anticipated, unit of money added by the banking sector then lowers the societal interest rate below its natural level. Why? Because a new unit of money (with an objective valuation) creates a perception of a higher propensity to save on the side of agents, which, however, does not correspond to the agents' real-time preference. If a new unit of money is not created, the propensities to consume, save, and invest, will not change. In other words, the interest rate will correspond to agents' time preferences. It is the addition of an M unit (with presupposed exchange value that depends on the price of money) which must, by definition, lower the interest rate and create a higher (artificial) propensity to invest, while the real higher propensity to save would be absent. The ABCT occurs. However, is it possible to base the ABCT explanation on an objective assumption of money's purchasing power? We do not think so. The Austrian theory is based on subjectivism and the subjective value theory propositions. It is impossible to claim that we have to presuppose money's purchasing power to explain money, as Mises (1953) did. The theory of subjective value forces us to explain the price of money as any other price on the market. Here is the line of reasoning: human subject – higher subjective valuation of good B, which I want, compared to good A, which I offer – the act of exchange – the creation of price as A/B or B/A ratio (the ratio of A/B or B/A depends on the view of the participant of exchange) and this line we have to apply to money, meaning here to replace A or B by M without presupposition that M has its objective exchange value based on its price. Therefore, our first task will be to challenge Mises (1953) and point out misconceptions in his explanation to the objective exchange of monetary value - which depends on the purchasing power of money - through the regression theorem.

[20] For the exact formulation of this thought process, see Rothbard (2004, p.764-765) or the short quote in footnote no. 18. The basic point is that also the price of the money, or the purchasing power of money, must be explained in terms of its supply and demand. The price results from the supply-demand process. Not the other way around, as reservists claim; more precisely, they rely on Mises´s claim.

2.1. Regression theorem. Incorrect attempt to explain the purchasing power of money

The fundamental logical error in the argument about the purchasing power/price of money was incorporated into today's general arguments of the Austrian school by Mises (1920), with his Theory of Money and Credit in 1912. He explains that economic calculation is, basically, only possible in money terms[21]. Mises (1953, p. 97 - 124) is devoted to explaining the price of money, to which he introduced the concept of the regression theorem. Mises develops the arguments of Menger (2007); however, he made two logical errors. The first and fundamental one is relates to the concept of economic calculation he explored in more detail later on. He (1920) argues that one should make an economic calculation based on the existing (monetary) prices of commodities. This statement is wrong. Whether monetary or non-monetary, the existing price cannot be a tool for man within his future-oriented actions. Why? The existing price, created based on the exchange at time t, results from the evaluation of the mutually inverse values from the participants of the exchange. Their evaluation was influenced by the economic context that existed in t (e.g., yesterday). When a new calculation process starts, and a new price of some commodity arises at t1 (e.g., today), there is already a new economic context for these participants. The context and evaluation of man in t1 are logically incomparable, although it might seem psychologically similar to that which was at t. The current (t1) calculation process cannot be deduced from, or inspired by, previous prices. It is impossible to base the action on the past prices when entering the exchange and creating a new, today's price. Today's price is the outcome of today's (not yesterday´s) evaluations. Besides, we face an empirical and practical problem related to the time element. How far shall we go into the past to derive today´s prices? Should we, as Mises implied, derive it from a very recent price (because prices do not move as fast in the short period)? Which one is it exactly?[22]. This entire reasoning is simply wrong. Mises (1953) already applies this principle of deriving the money-price of a commodity-money from the past industrial price (of a commodity) in question when man first uses the commodity as money. Mises (1953) derives the price of money, or its purchasing power, as follows: people are supposed to expect that the purchasing power of money tomorrow is based on the purchasing power of money yesterday. Mises assumes only small value changes in the perception of the price of money in a short period of time. If we trace this process backward, we come to the illustrative point when the price of money (e.g. gold) is first derived from the industrial price of a commodity (gold), which people began to use as money. However, if the argument concerning the creation of a price based on a past price is logically inconsistent (because it links the past value context to the present one), how can the regression theorem correctly provide an explanation for the price of money? This is not the whole problem. The second problem is that the commodity's industrial price is inherently

[21] Actually, neither Mises nor any other representative of Austrian school provided arguments on how our predecessors calculated without money (so called in-kind calculation method).

[22] A detailed argument about logical errors in the Misesian system concerning the problem of calculation can be found in Pošvanc (2019) with a proposal for adjustments, which mainly concerns the answer to the question of how did we successfully calculated before the "advent of money".

different from the price of a money-commodity which bases the objective exchange value of money.

The pure industrial price is based on the inverse subjective attribution of the so-called use-value of commodities exchanged by their owners. They exchange two commodities because each of them attributes use-value to the good they inversely want. Both want to satisfy some of their needs with the commodity the other has. So, e.g., Alice is attributing an exchange value to the commodity she owns and use-value to the commodity she wants from Bob; and vice versa from Bob's point of view. That is why the industrial price can arise. Things are different, however, in the case of money. Money is used for nothing but an exchange. Alice does not want money to consume it. She wants money because she can later exchange it for something she will want to consume. The same is true of Bob: yesterday he received money for something he sold. Thus, both exchange participants treat money differently than other commodities; intersubjectively and over time. They attribute to money only objective exchange value over time, which is intersubjective in nature (everybody considers money´s objective exchange value, therefore we speak of intersubjective nature). We know that the subjective use-value of money coincides with its subjective exchange value derived from money´s objective exchange value; money is only meant for exchange. So, when exchanging money for goods, Bob (the owner of money) attributes the exchange value to it today; and Alice (the owner of goods), who acquires money from Bob today, already knows that she wants to exchange money in the future as well - the same way Bob knew this today. So, when Alice and Bob exchange money, they do not perceive money as other commodities. They consider it as money, which is possible to exchange later exclusively. That is what money is all about. The point we try to make here is that the valuation of money, which is solely connected with the price of money, arises based on a different evaluation process than the industrial price of commodities when they are exchanged! Furthermore, it means that the price of money cannot be logically derived from the past price of the commodity we decided to use as money in the past. Industrial – barter – price is the outcome of the inverse, subjective valuations of Alice and Bob. The money-price is the outcome of a subjective valuation of a commodity and, at the same time, intersubjective valuations of money by both Alice and Bob (and others in any economic community) over time. When processing the monetary exchange, Bob, owner of money, attributes use-value to the commodity which belongs to Alice, and Alice (and all other participants of the economic community, Bob included, if he possesses any other parts of the money supply) attributes value to the money-commodity intersubjective exchange.

Therefore, Mises (1953) did not provide a relevant explanation of the price of money based on the theory of subjective value, where the price is the result of an inverse valuation of the two participants in an exchange. In his theories, he presupposes the price of money based on a given assumption, without which we can know nothing about money (e.g., Mises (1953, p. 109) referring to "Such a point d'appui is necessary before the gap between satisfaction and "useless" money can be bridged"). However, this given assumption is the whole explanation to the problem, (MISES, 1953, p. 97-124). By assuming the existence of the price of money, Mises implies that the goods we use as money already have prices. In this case, it is a matter of objectification of the price of money. For Mises, the price of money is not the result of

the valuation process of agents. Nonetheless, this is assumed, and the evaluation of agents concerning money changes are based only on the abundance of a given commodity in the economic community[23].

So, we are still faced with the problem of explaining the origin of the purchasing power of money. On what base is money valued? This is not a trivial problem. We are looking at an argument in a circle. The price of money is the inverse price level of what we can buy with the money. However, the price of money is what we can buy with it. At the same time, we know that any price arises as a result of demand and supply. Concerning supply and demand, reservists ask for constant monetary stock (supply). At the same time, they derive demand for money from changes in its price, which is evident from claims that it is rising/falling prices that cause the demand for money balances to fall/increase from the subjective point of view of the owner of money balances. This is also an apparent objectivist assumption about the purchasing power or the price of money, because the price is not the outcome of both supply and demand forces. Mises and reservists never define a common intersubjective need for all men who use money as a means to satisfy this, the same intersubjectively perceived need. However, this is in stark contrast to the subjective value theory and the pricing theory where the valuation and subsequent pricing are established based on the needs-means relationship. Instead, fractionalists align their explanation to the subjective value theory and price formation. They claim that the new monetary unit in the system reflects a higher demand for money. However, they don't explain the phenomenon in microeconomic and subjective terms. It is not easy to explain. Let us consider the example of Alice and Bob. Money is perceived subjectively, but also intersubjectively - that is what money is all about. So, where does the demand for money come from? What effect does the money supply in the form of a newly-added unit create? We are back to the question set out above. If the fractionalists are correct, and we claim they are, they must explain the microeconomic demand for the additional monetary unit, without the shortcomings of the regression theorem.

2.2. Creation of money value – discovery process of coincidence between natural interest and monetary interest rate

To understand the supremacy of the fractional banking system over the reserve system lies in understanding the usefulness of the fractional system. We claim that banks in the fractional system provide an essential service – a much more effective discovery process of marginal debt exchange, i.e., the exchange of present time savings for future products, compared to the reservist system. We know that there are only potential capital resources, and that these are limited. Their limitation has a dual nature. On the one hand, they are not infinite, which is a feature of reality, although we think that the perception of scarcity does not come from this fact[24]. Besides, it would always depend on the decision of the potential creditor whether

[23] See Pošvanc (2020b) for a more profound critique of the regression theorem.

[24] Scarcity, as a phenomenon, has a normative character. It is not a fact of reality. The agent grasps reality, and he interprets the reality as scarce due to the normative nature of the mind, which defines the state "as something should be", which compares to the real state of reality "as something is." Only the given comparison - the relation of the mind - brings the

he would allocate his resources to a given project offered by the potential borrower. There is, in principle, an infinite number of potentially offered projects from potential borrowers/entrepreneurs because they are in the form of (business) ideas. Suffice to say, there will always be some dissatisfied business projects on the market. Thus, while on the supply side of resources, we face a double restriction (limited resources and the decision of owners on their allocation), on the demand side of the implementation of potential projects, there is almost infinite demand. Intuitively, we see the potential source of demand for additional money unit into circulation; it is based on the marginal decision to allocate free resources. What do humans need to consider regarding the allocation problem? We claim that humans use a new monetary unit to mediate the marginal decision (estimation, guess, possible entrepreneurial opportunity) of the creditor (owner of existing resources, savings) and the debtor, the person who offers an entrepreneurial opportunity (economic project, roundabout capital structure) to agree on the optimal allocation of existing resources over time (POŠVANC, 2020c). If Selgin and White (1996) write about the macroeconomic demand for a new currency unit in circulation, they should keep in mind this intuitive characteristic of the (micro-level) situation between two individuals (this is indeed the micro-level description of the reservists). Basically, fractionalists have this clear in mind. It is possible to see this explicitly in another conversation among fractionalists and reservists White (2014), Hülsmann (2014), Selgin (2014), Hummel (2014), White (2014), Selgin (2014), Hülsmann (2014), Hummel (2014) and Selgin (2014); found in White (2014). We would like to highlight one point in this conversation: the question of the use of a new monetary unit. The fractionalists were on the same track. We will soon get there. Basically, they claimed that a new monetary unit balances the natural interest level. White (2014) made the point first. However, let us cite Selgin, (2014) who puts it very clearly:

"Credit expansion serves in such cases not to drive lending rates below their "natural" levels, but to keep them from rising above those levels".

Hülsmann's (2014) stated as follows against White's/Segin's claims:

> This brings me to the central question: Is it really the case that credit expansion, when it occurs simultaneously with an increase in the demand for money, does not drive interest rates below their natural levels, but prevents them from rising above those levels? The premise of the whole argument is the notion that the increase in the demand for money, if unchecked by a corresponding increase in the money supply, would entail an intertemporal disequilibrium. But why should this be so? It is true that the increase in the demand for money would tend to entail a temporary increase of market interest rates (the latter would not necessarily be higher than before, but rather higher than they would have otherwise been). **But why should we interpret this event as an increase of the interest rates above their natural level?** Why is that temporarily higher level not the natural level itself? Why should the structure of production not be adjusted to interest-rate changes resulting from variations of the demand for money?" **[bold mine].**

perception of scarcity. If the reality is not in the state that the agent would like it to be, then he interprets it as scarce. On the contrary, pointing at the problem, reality does not interpret itself. Reality is. It does not perceive whether it is scarce or not. It is only an agent who, *in the view of his goals*, interprets its condition as scarce. If there is no agent's goal, there is no perception of scarcity. Reality would just be. The problem of scarcity is also addressed in Pošvanc (2019a). Pošvanc (20190b) shows that (2019). Wysocki and Block´s argument should logically lead to identical conclusions.

It is clear that the conversation is focused on the same issue, the problem of the natural level of interest. We claim that the micro-base for this statement is the above-mentioned marginal state of the last possible debt exchange between some marginal creditor and debtor. Without answering the question "what is the natural interest?", Hülsmann and all other reservists would always "have an ace in the hole". As stated above, there remains the problem defined earlier by Hoppe with Hülsmann and Block (1998). They argue that the problem of the necessity of an additional monetary unit is secondary. It is solved by changing price level, which ensures that increasing prices of the factors of production motivate holders of the existing money stock to re-enter/withdrawn cash balances into circulation due to their growing purchasing power. It follows, then, that no new monetary unit is necessary; quite to the contrary. However, this claim is only possible if we presuppose objective existence of the money price, using the regression theorem to explain it. We already showed that the regression theorem does not solve the problem of how we derive the price of money from our valuations. Also, fractionalists are aware of the fact that there are opportunities for the allocation of existing resources to potential projects of debtors (they describe some macro-demand for new monetary units) and they state that new units push money interest rate towards its natural levels. It should be clear that only by answering Hülsmann´s question "…why should we interpret this event as an increase of the interest rates above their natural level?" we are able to state whether credit expansion (or any monetary unit expansion – do not forget that there are also new units of gold) balances the interest rate towards the natural level. Without correctly answering the claim that credit expansion balances natural interest levels, it is a purely auxiliary (blind, empty) statement. The area in which we focus, therefore, is debt exchange (a plan to produce something over time while using someone else's existing resources) and the problem of interest. Let us dig into this claim in more detail.

Most reservists understand the problem of interest in terms of time preferences. Hülsmann (2002) and Murphy (2003) can be seen as exceptions. The Misesian argumentation system faces a problem regarding the phenomenon of interest: how could someone prefer good-A today compared to good-A (of an identical kind and quality) in the future, if we do not know the future and there is nothing like a good of an identical kind and quality over time exists in value terms. The valuation of a good necessarily changes over time; humans create different value contexts all the time. Hülsmann (2002) correctly points out that the concept of time preference applied to the problem of interest must to be considered only in the counterfactual context of action, i.e., as the imagination of good A "in the future" in (t) (not reference over time per se). Also, he persuasively claims that it is impossible to derive the price of interest from the concept of time preference[25]. In a Misesian system, an interest rate is a time preference of good M (money), which tells us that a present good M is always preferred to a future good M. It is necessary to point out that, in the context of a Misesian system, an interest rate cannot be

[25] Herbener (2011) correctly points out that time preference is about present A being preferred to future A, and that interest should be a ratio of present A/ future A; that is impossible to construct for goods other than money. However, Herbener (2011) closed the problem with a strange argument (for me) that it is not a problem, because it is money that enables us to find out the interest rate. Fine, but what about the natural or originary interest? And how had our predecessors dealt with the phenomenon before the dawn of money?

connected to any other good than money – M! The discussion that Hülsmann (2002) started within the Austrian School about the interest rate as a value spread was "ended" by his own critiques that Mises relates time preference only to money, and not to any other good, which, once again, implies that money is a good that is value invariant or value objective over time[26].

However, interest is not a monetary phenomenon. It also exists outside the monetary system. It manifests itself either in what Wicksel (1936) calls the natural interest rate or in what Mises (1998) calls the originary interest that would exist on the market if the exchange took place without money or currencies. Neither Mises (1998) nor Rothbard (2004) denies the existence of interest outside the monetary system. Indirectly, Hoppe[27] claims the same and criticizes Keynes' description of the interest rate as a monetary phenomenon. For the purposes of this work, let us only imply, without further arguments, that the interest rate must exist even outside of financial relationships; before the advent of money. How then, however, in the context of time preference, can interest be connected only to money, as clearly stated by some Misesians ? Would it not be the case that, if there were no money, people would not use an interest?

Given the problem of the regression theorem to explain the price of money, as well as the problem of interest based on the time preference concept, reservists do not have a clear transition from non-monetary to monetary economy, although both economies have the interest phenomenon. In a monetary economy, interest is successfully expressed through money. However, it is complicated to express it in a non-monetary one. Why don't we see it explicitly there? If I lend a neighbor a hoe in the spring, which he will use to grow apples, and he returns the hoe to me in the autumn along with a bag of apples, we know, if only intuitively, that apples could be a satisfying definition of interest. However, if I exchange 10 tomato seeds with a neighbor in the spring for 30 apples in the autumn, we cannot identify the principal nor the interest, even though we know interest is present in the second exchange.

We know that any exchange in time includes interest, and that money successfully expresses interest. We can differentiate between principal and interest in monetary terms. So, money as a commodity serves only to express the interest rate, distinguishing it from the principal? Definitely not. However, these examples highlight key points of the problem. We do not explicitly see interest rates in a non-monetary economy: all we see is a separate phenomenon of the natural interest (basically, it cannot be a "rate" in the non-monetary economy; it is only a phenomenon per se). On the other hand, we can definitely identify an interest rate in the monetary economy. Then, we can express the interest rate, which should correspond to the natural interest rate. So, in both economies, We talk about the same phenomenon, but we can only express it more or less precisely in a monetary economy. What we lack is a description of how this phenomenon happens outside the monetary economy, as well as a description

[26] See e.g. Guning (2005) or Herbener (2011).

[27] Hoppe (1992, p. 213-214).: "According to Keynes, since money has a systematic impact on employment, income, and interest, then interest itself — quite consistently, for that matter — must be conceived of as a purely monetary phenomenon (Keynes 1936: 173). I need not explain the elementary fallacy of this view. Suffice it to say here again that money would disappear in equilibrium, but interest would not, which suggests that interest must be considered a real, not a monetary, phenomenon".

of the transition from the non-monetary to the monetary economy, so that the description is consistent in both the non-monetary and monetary economies. When talking about interest, we talk about debt exchange, that is, an exchange taking place over time. As it will be seen later, it is precisely the description of the process of expressing the interest rate in money for what the flexible money supply is necessary, i.e., the need to add a completely new unit of money into the circulation; fractionalists claim the same.

So, how to express the interest rate within a non-monetary economy? We cannot rush to conclusions. Since interest is a phenomenon connected with time, and the problem is to explain preferences of goods over time, first, we have to offer a modification to the theory of subjective value. Pošvanc (2019a) suggests one possible solution to explain preferences over time to define natural interest phenomenon. The modification of the theory of subjective value concerns, in principle, the view of the man's problem of valuation in the time continuum. The concept of value arises from the causal link between needs and means (goods). The suggested modification shows that man always satisfies some sum and a combination of his needs by some sum and a combination of goods (portfolio). The causal relationship of the current time theory in the form of "a need is satisfied by a good" is modified in terms of "the sum of needs is satisfied by a portfolio of goods (sum of goods)". This is a small update. However, it brings several essential elements to describing economic phenomena over time. The old theoretical approach did not allow us to operate over time because of different value context of goods changing over time. Time limits the use of Menger's need-good causality. The problem here is the logical attribution of value to a particular economic good over time. The value causality associated with identifying a specific and particular "need-good" relationship has a value-heterogeneous character over time. This is due to the changing economic context and valuation of the agent.

However, the portfolio of goods is, in fact, a formally-logical homogeneous construction of the mind, comprised of individual goods and always different providing. At the same time, it provides a homogenous concept applicable over time; the portfolio per se. This brings, qualitatively, new possibilities to describe economic phenomena over time. The causality between needs and goods arises at the teleological level between the sum (combination) of needs satisfied by the sum (combination) of goods. Man uses a portfolio of goods over time to satisfy his needs as they change over time. It also relativizes the relationship between the several goods of which it is composed. Comparison over time is then possible. This is because the portfolio bears a relational character when a man can distinguish its change over time. The portfolio is a similar mental concept structured over time, meaning that a portfolio today is still a portfolio tomorrow; and it is this structural character which enables us to compare it over time[28]. The modification provides a more elegant explanation to the problem of evaluation over time, and it is empirically intuitive; it manifests itself in the real ownership of a sum of goods, in the concept of hoarding of our primitive antecessors, in the accounting representation of

[28] This value variance of goods caused by time is also a problem faced by the misesian explanation of the interest rate based on time preference.

the portfolio of goods in some individual accounting balance sheet, in the accounting balance sheet of a company, in the theories of financial portfolios, etc.[29]. The concept of a portfolio allows an individual to assess his economic activity as well as an exchange. The individual can assess whether an activity leads to the development of a portfolio that satisfies or not his needs over time. In principle, the concept allows him to calculate (even without money). Men can compare economic activity 1 with economic activity 2 in the context of a more appropriate portfolio, to decide subjectively which leads to a better portfolio. Likewise, He can compare what he has to give up or gain in exchange for using his portfolio. Although a primitive method of calculation, it is still identical today; the only expression of the calculation is much more accurate because people use money and currencies[30].

This modification enables us to describe the natural interest as a spread. Pošvanc (2020a) shows a detailed description, but here we only summarize its essential points. Concerning the exchange over time, the creditor and the debtor consider two mutually inverse but subjectively perceived alternatives, should they implement the debt exchange agreement. The lender considers giving up some part of his portfolio for some time, say from t to t1. This shows his time preference related to his portfolio. He then assesses whether it will jeopardize the satisfaction of all his needs if he relinquishes the part of the portfolio until t1. Simultaneously, he considers two alternatives for his actions. The first is related to the reduction of the portfolio at time t and postponement of his business activity until time t1. His current portfolio will be depleted in t until t1. However, he assumes that the future portfolio in t1 will be enriched by his economic activity and, at the same time, a compensation from the debtor, who must eliminate his liability at time t1. The alternative is his not giving up anything, carrying on with his business as usual. The first alternative brings higher diversification to his portfolio, but its impoverishment today. The second alternative is his unchanged activity. The debtor assesses the situation inversely in time, but in the same formal-logical way. Natural interest arises as a spread between the creditor´s two alternatives and the debtor´s two alternatives. Due to the relational characteristics of these portfolios, the given spread - natural interest - can be perceived. Both creditors and debtors can perceive these changes if they enter the exchange compared to what will happen if they do not enter the exchange. They can see the endangerment of the satisfaction of their needs over time (creditor in time t and debtor in time t1), deciding to enter the debt exchange if its spread related to their portfolios is narrower than the spread of non-exchange.

Before talking about the creation of the money structure, it is necessary to understand the following characteristics of the debt-exchange relationship. These features will be expanded

[29] See, e.g., Horwitz (2010), who argues in a very similar, though not identical, way about the connection between the structure of the human mind mentioned in Hayek (1953) and the theory of the firm. Although indications of the use of the concept of assessment in terms of a combination of needs satisfied by a combination of goods are already present in Menger (2007), we consider Horwitz (2010) to be one of the first explicit attempts to identify a view of the problem in a similar way to the proposed modification of the theory of subjective value presented in Pošvanc (2019a). Wysocki and Block (2019) also use a combination of needs to define the concept of economic goods to solve the problem of homogeneity and heterogeneity of goods.

[30] Attention was brought to this given characteristic by my friend, František Chroustal (2017).

in the next steps of the following descriptions about money and banks, so it is necessary to mention them. The structure of this relationship defines: a) the immediate transfer of resources from the creditor to the debtor at time t (zero maturity), b) what the debtor should return at time t1 (it implicitly includes natural interest), c) the maturity d) a time preference related to the portfolio of the creditor, e) the legal status of the exchange, f) where applicable, the collateral, or legal consequences, related to the default on the debt. We should also realize its structure is fully future-oriented; nothing is derived from the past. It has the character of a plan and an intention. Since it is a logical-abstract shared mind structure, created at least by two members of the economic community, it allows transfer to a third party, and mutual comparison among others. Thus, the relationship creates a solid mind structure within which two or more individuals can work, perceive, enforce, discuss, and monitor its development and changes, seeing the success/failure of its fulfillment/non-fulfillment. Comparing portfolios alone is a limited, but possible, strategy. Debt exchange is also expressed through a good, that implicitly reflects the natural interest (for Böhm-Bawerk, interest is "included" in a good subjected for a settlement later in time). These characteristics are essential to describe the money structure and the price of money consistently within the theory of subjective value. Once we describe the concept of interest in a non-monetary economy, we can describe the transition from a non-monetary economy to a monetary one. Of course, we can reconstruct the historical aspect of the transition from a non-monetary to a monetary economy only as some kind of conjunctural history based on abstract principles. Empirical data do not exist: there is only speculation and logic. As Pavlík (2004) shows, Adam Smith used this method and appears in many works of many evolutionary thinkers. We provide not only a conjectural explanation but also a theoretical one[31].

Logic thus shows us that, in primitive communities, a debt relationship could arise spontaneously based on the existence of some primitive legal status in a given group. The existence of any group implies the existence of rules, albeit unspoken, (PAVLÍK, 1999). Ontologically, the group is a new structure (LAWSON, 2003; LEWIS, 2019). It is the relationships of individuals and their combination that causes (morphology) that causes ontologically perceived novelty; it is its morphology that causes a group of people to not just be the sum of individuals (LAWSON, 2003; 2019)[32]. As Pavlík (1999) logically implies, and Graeber (2011) shows empirically-logically, the existence of the debt is a very probable phenomenon in the primitive group of our predecessors. Only point e), which implies point f), is necessary to spontaneously establish a debt relationship. So, in a primitive community of our predecessors with a limited degree of self-awareness, but governed by the norms of distributive justice

[31] Cf. with North, 2012, and see Hansen, 2019; for us, money is not an empirical, conjecturally-historical phenomenon. It is real human action phenomenon. However, not merely aprioristic but evolutionary aprioristic. For the concept of evolutionary apriorism see Pavlik (2014) or the introductory English version in Pavlik (2006).

[32] Cf. with Mises (1998, pp. 143 - 145). He describes a society in the context of the individual. In our opinion, it is interesting to observe the incongruity of this passage. On the one hand, Mises realizes that society is logically and historically the ancestor of the individual, and that an individual can only develop within a community. Only there he experiences "*delightful and most sublime experiences*". However, Mises, and many other Austrians, analyzes a community only from strict point of view of an individual, and in principle, there is no discussion that social phenomena have a character other than that of the net sum of individuals' behaviors.

(PAVLÍK, 1999), there is no need to define conditions a) to d) in advance for the existence of the phenomenon of debt. Conditions a) to c) are implicit; d), "time preference", it is disputable. Time preference was probably on the verge of the instinctive conflict. Here, we mean that it is possible to imagine a situation in which a community had very limited resources due to an unsuccessful hunt. So, they had to make a difficult (instinctive) "decision": either abandon/kill the weakest members of the group or limit themselves to save the whole group or part of it. In other words, the group member(s) surrenders goods either voluntarily in favor of another group member or with the instinct to preserve at least some stronger part of the group won. However, member(s) of the group implicitly expect(s) the fulfillment of the obligation sometime in the future by something that may not be explicitly defined at time t. Simply put, it does not need to be defined, because each member of the group assumes that the group (a whole) will take care of him, if he gets into trouble. Subsequently, later in time, compliance is implicitly required and enforced by the norms of distributive justice. Therefore, the awareness of points (a) to (c) came later to our predecessors, with growing self-awareness of individual members from the primitive community. We can now safely claim that it is the structure of the relationships per se and its consolidation, based on the spontaneous repetition of activities, that allowed understanding other phenomena of debt: maturity, a predefined way of settling the commitment (without our predecessors differentiating between principal and interest) and time preferences.

How did the first primitive money originate? Spontaneously created debts within the community created the specific structure of the mind. Our predecessors finally realized that they were dealing with debt, which has its characteristic features. We have to imagine also a growing complexity of spontaneously arisen debt relations within a historical community. The increase in complexity could be caused by anything, e.g., by increases in the number of members in the community, implying the expansion of mutual interactions, rising awareness, extended times of primitive debt exchanges, mutual encounters of different communities controlled by different rules of debt recovery and their interactions in a small or broader area. However, the complexity need not be anyhow close to the term of complexity we face today. The mind awareness of our predecessors was more superficial. Complexity pushed them to try to solve this problem as very separate phenomena. The problem was how to carry out an additional debt exchange in a given economic community as easily as possible; basically, our predecessors had created an intersubjective and common need (to liquidate last debt exchange as easily as possible). They started to solve this new problem (common need per se) with higher abstraction, which enabled them to simplify the whole problem while finding a solution; they started to use newly created means: commodity-money. How to imagine these start-conditions? We have to realize that the debt exchange structure of mind existed because they engaged in exchanges without money. The mind structure was future-oriented. So, any member of society could grasp it. It could also be that our predecessors had some kind of name or gesture for it, or it was a part of primitive language. Complexity gave rise to new problems. Problems had to be solved by some abstraction, which started to be promoted through the community. Even if, in the beginning, it was not a conscious idea, it is much more probable they first used some particular good spontaneously to facilitate the exchange, and only after they realized that the

situation would be solved more easily if they used only this particular good repeatedly. If the particular good that reflected this abstraction was attractive and really improved the situation our predecessors, we can presuppose its adoption. Basically, our predecessors introduced a kind of spontaneous accounting standardization for debt exchanges. It has to be stressed that the situation is not about that chosen good per se; it is about the mental structure which started to be expressed in the chosen good. Our predecessors started to express complicated and complex primitive debt relationships in a simpler way – by commodity-money. Then, as a matter of empirical suitability, they searched for the best commodity with properties like transferability, durability, divisibility, and multi-usability. The preference of one commodity over another involved various empirical, religious, social, cultural, and political connections. It was also related to the empirical characteristics of goods (their storability, portability, divisibility, and so on)[33]. The process was probably more gradual and spontaneous, as they grew in awareness. It is as if they created a more abstract economic layer above a concrete layer of diverse debt exchanges, which enabled them a more natural handling of the problem. The new layer structure allowed people to differentiate new phenomena. On the one hand, it was possible to distinguish between principal and interest. So, the commodity money began to spontaneously reflect the phenomenon of natural interest. Our predecessors became aware that they were using something they called interest; until that moment, it was only implicit. Another possibility was to express prices of other commodities in money; this allowed more precise economic calculation in money terms. The use of the given commodities made it possible to express the features of the debt structure mentioned above - points a) to f) only in (terms of) money. Money thus acquires the highest liquidity among all other goods.

2.3. Demand for new money and money substitutes (IOUs) – Fractional system as a superior banking system

Although the new money layer expresses the same as the previous layer of primitive debt relationships, it is not precisely so. New features in the structure of debt relationships, identified because expressed in money, make people more aware of the exact spread associated with debt exchange. The spread of a given exchange is composed by time preferences, debt maturity, the existence of a receivable-liability, interest rates and its legal aspects (collateral and possible penalty). Therefore, the process naturally becomes the subject of specialized business like banking and financial services. It is this whole process behind it which brings into existence, as an outcome of many intersubjective relations and new intersubjective phenomena, the structure, the value and consequently, the price of money. From a traditional Misesian approach, a different way of explaining the purchasing power of money or the transition from a non-monetary economy to a monetary one is presented here. While Mises´ regression theorem looks for something the beginning of money among the most tradable commodities. We show that such a beginning does not exist. Human subjects created a higher (abstract) layer structure of relationships expressed in commodity money. It does not have any specific starting point: it

[33] The empirical variability of what people used as money is very precisely documented, e.g., in Einzig (1947; 2014).

is a new structure over the lower layer of debt relationships. Money has its purchasing power given that humans added it to their shared mutual mental layer. The attribution of objective exchange value to money and the price of money depends or is subjected to the success/failure rate of this relationship structure. The morphology of this structure must also be discovered; and, as such, it provides men with information about the intersubjective valuations of this commodity considered as money, because this commodity-money reflects the morphology of the structure; the commodity is given value agio/discount based on the success/failure of the whole structure per se. One of the key explanations of why a fractional banking system is a superior banking system is the demand for already existing or new money, or IOUs. As mentioned, Hülsmann (2003) and also by Hoppe with Hülsmann and Block (1998) correctly demanded a microeconomic explanation of the demand for a new commodity money unit or currencies (IOUs). The answer is: in time, a new monetary unit solves the problem of facilitating an additional marginal unit of debt exchange (obligation) per se. In other words, we can say that it is a process of discovering marginal time preferences and a marginal unit of savings to be used/in the context of marginal production structure. The coincidence of natural interest with monetary interest rate exists in that moment, as well as the coincidence of savings with investments, as well as the coincidence of time preferences with future economic plans. Given that this is an intersubjective phenomenon, born of the agreement of two or more people, we argue that we must discover the existence of the phenomenon – a structure. If we need new commodity money and new IOUs in circulation, a fractional banking system is better than the reservist system. This is so, we claim, because it provides more flexibility and accuracy to build the structure in question.

At an intersubjective or a societal level (basically among any number of individuals; however, at least among two), the natural interest perception is changing in a way that owners of capital goods are inclined to lower (it is their decision!) their time preferences while being inclined to allocate their resources to new projects, market forces will add new monetary units into the economic system, rising the demand for money that is supposed to facilitate an additional unit of debt exchange If the natural interest perception is changing in a way that owners of capital goods are inclined to rise (again, it is their decision!) their time preferences, while being inclined to not-allocate their resources to new projects, market forces will reduce new monetary units, shrinking the demand for money. We must emphasize once again that the natural interest or originary interest is not a rate; it is not rising or declining; it is a spread, so it widens or narrows. Only time preferences can rise or decline. This statement is a logical consequence of the transition from a non-monetary economy to a monetary economy elaborated above. The main causal (microeconomic, although intersubjective) demand for additional money/currency units in the economic community is the effort to discover the correct reflection of natural interest: marginal state of resources and new economic plans. Given that natural interest is a separate phenomenon, which can be identified outside the

monetary economy and depends on the perception of those individuals who execute debt exchange, it is also necessary to continually discover its perception[34].

The discovery of a marginal, least possible, debt exchange allows to correctly reflect the natural interest rate in the economic community. The reason is simple. If we did not have money, we would look for the least possible debt exchange to allocate scarce resources somewhere, given that the number of offered projects always necessarily exceeds the possibilities of implementation. The same happens with money. Moreover, to reflect accurately the natural interest expressed in money, people sometimes need to add an extra unit of money into circulation. If they were ever unable to add an extra unit, this would cause a wrong reflection of natural interest. Indeed, the impossibility of adding a unit of money would lead the existing owners of previously added units to push up the monetary interest rate (expressed in money), which would not correspond to a spread in the natural interest; in other words, money owners would cause sub-optimal resource allocation and natural interest spread to widen. This would create a discrepancy between natural interest and nominal monetary interest rate; basically, the morphology of the structure of economic relationships would be less proper than estimated by market participants. It is precisely here that we reach the point where we can support White´s (2014) and Selgin´s (2014) intuitive claims, because we have elaborated new fundamental arguments. It is necessary to emphasize that implementing a marginal "unit" of debt exchange does not mean that we are describing a mechanism on how to push down the natural interest level. natural interest is a spread which widens or narrows. It narrows when the monetary interest rate (or balances) best reflect this spread. Moreover, the only thing we can observe is whether the monetary interest is going up, down, or it is stable.

Let us describe the process of adding a new unit of money (commodity money) in an economy. The process has clear rules, relating to the demand from marginal borrowers and creditors for an additional unit of the commodity. Demand for additional exchange, related to the allocation of an additional unit of resources to an additional business project lead to changes in the perception of natural interest. This change is related to finding an additional economic project and a marginal unit of resources for it. Theoretically, nothing needs to change in the monetary expression of the interest rate: it can remain, e.g., at 5%, and an additional monetary unit in circulation is needed. Otherwise, the owners of existing money could force the monetary interest rate to rise above 5%. However, to simplify the interpretation, let us assume that a change in the natural interest rate also decreases the monetary interest rate (e.g., to 4%). This means that the owner of capital resources (not money per se) is willing to provide its resources with better conditions to a potential borrower[35]. This demand allows the marginal producer of a commodity-money, which has not been profitable at 5% interest, to reap

[34] If we imagine illustratively the situation in the static mode in the form of stopping any exchange in time in the economic community, the perception of the interest would disappear. It is the continuality of the process which enables us to grasp the interest.

[35] The reason for lower money interest rate may be the diversification of the creditor´s portfolio with a project that has a lower interest rate but has, e.g., better maturity, or the borrower /has more credibility (?), or the project fits into the creditor's portfolio in the given form. Moreover, it also means that the creditor does not prefer a priori higher to a lower monetary interest rate. He prefers a better-diversified portfolio over a worse one.

profits. The reason is that in the production of a money-commodity, the yield of its producer must be higher than the 5% interest. Otherwise, resources flow to other more profitable areas than the production of the money-commodity. A change in the perception of interest in the community, e.g., to 4%, causes the commodity's marginal producer to become profitable. Therefore, this producer ensures that the owner of an existing commodity-money unitnot in circulation, does not push interest above 4%. Suppose the perception of interest rates does not change. In that case, the marginal producer will not be profitable and exit the market, leaving only producers whose yield is over the 5% to produce new units. The process takes place so that it is necessary first to change the perception of natural interest (which does not depend on money), and only then to add an additional unit into the market. In reality, of course, the process is smooth and entrepreneurially discovered, i.e., a marginal commodity producer strives to market more and more new units of the commodity. However, if the community reflects a 5% interest rate, and its yield related to the production of a given commodity is only 4%, it leaves the market because it is unproductive. This causes a slowdown in the delivery of new units of money-commodities to the financial market and an equilibrium of the lending market around 5% monetary interest. At a 5% rate, new units of money-commodity are still produced – it is the counter-force to the owners of older money-commodity units not to push up money rate above 5%. The income of a money producer is relative. He also produces commodity-money based on either debt or perceives the alternative returns on his capital resources through the interest rates. If he produces a 4%-return on his production, and the interest rate is 5%, he will go bankrupt. Respectively, in the case of the resources he uses for production, he would rather allocate them to alternative, more profitable projects[36].

Based on our arguments, it is possible to claim that the banking sector is another superstructure over the commodity-money layer (system). It enriches the structure of debt relations with new phenomena, just as the commodity-money layer enriched the lower layer of the primitive debt relations. The professional banking sector focuses on nothing else except identifying the last possible debt exchange in the economic community. Banks specialize on the activity of spreading the debt exchange. Do they provide anything more, while "building" the money structure, than the interindividual monetary relations on the commodity-money level? Yes, they do. Besides standardization of debt exchanges, they provide standardization of debt conditions, legal standardization related to collateralization, and debt recovery. They are directly focused on discovering socially perceived interest rates (they standardize rates for specific groups of clients, based on their reputation and economic health) and time preferences, and provide many possibilities for offsetting existing debts. They use their product for all of these activities – IOUs or currencies created against money reserves (e.g., in the form of gold or silver) - or other financial assets (instruments) with suitable liquidity and solvency. All this entrepreneurial activity creates a more robust and better structure compared to the

[36] This process can be politically abused when the producer is politically forced to produce a commodity, even if the interest rate is above the miner's profitability. An example from history is the silver mining in the Spanish colonies. The Spanish crown failed to service its debt and used South American mines and enslaved populations to produce silver. The result was the so-called price revolution in Europe when the prices of several commodities expressed in the price of silver rose during one century. For a detailed description of this situation, see Brian (2014).

interindividual, non-professional commodity-money layer. Under these conditions, it is valid for any market if banks face competition and we have an unhampered market.

An attentive reader should notice that the whole money or banking process is, whether at an inter-individual or professional banking level, invariant from the rate of societal goods-savings. An addition of a monetary unit (accumulated outside of the banking system, or entirely newly created/mined) does not create a perception of a higher rate of societal savings that enables some commercial project. An addition of a new monetary unit is a reaction or discovery attempt of the bank. It tests, on the margin, whether there is a higher rate of optimism for financing a marginal economic project not possible to finance before the change of the perception of natural interest. The bank is "searching" for this perception of natural interest. Our explanation, then, is based on a given and actual rate of savings in a community. Savings are always given and are a broader concept than capital goods. A new monetary unit that reacts to the change of the natural interest does not change anything about the sum of savings, nor time preferences. The sum of savings possible to transform into capital goods and time preferences of owners of savings, must be discovered. I A new unit changes the subsequent utilization of savings with all related consequences in the context of an inability to revoke a given decision to finance a marginal business project. A re-added, or a completely new monetary unit, facilitates the exchange of existing savings, which then become capital goods. As mentioned above, this process enables the valuations of past-produced goods. Evaluating them in a given monetary unit enables us to determine whether economic projects used to produce said capital goods were profitable or generated a loss. At the same time, it is a continuous, repeating, and never-ending process. In the monetary market, as in any other, humanity moved from using money at an inter-individual level to more sophisticated financing methods at the level of industry professionals – so-called market makers. What kind of market-making do banks then perform? The classical view talks about facilitating deposits and credit. In principle, however, it is a market-making of interest rates, goods-savings, time preferences, and legal conditions of debt. In other words, banks are dealing with and managing our (individual) economic plans – our structure in question. The banking sector is like the societal book-keeping of individual economic plans, economic conditions of these plans, legal conditions, and time-preferences.

It is the decision itself, either on an inter-individual level, or at an institutional level of a market maker, which allows the new unit of the commodity money or currency to enter the market. It is the same on both levels, inter-individual and institutional. The only difference is the range and professionalism around[37]; The level of the monetary interest rate varies over time, through the participation or not in exchanges. The critical question is whether the

[37] It is necessary to remind the reader that both at the institutional individual levels, the system of mutual debt relations is politically abusive. Just as it is possible to politically abuse the banking system, so can the relationship between a creditor and a debtor be abused, if the debtor is a public institution under political influence. In the case of abuse of a given relationship, we lose the purchasing power of money or currency at both institutional and inter-individual levels. Even gold or silver will lose its purchasing power if the debtor, whether a king, a ruler, a municipality or a state, does not serve his debt. Purchasing power is lost in proportion to the rate of the debt collapse. The collapse of debt causes economic resources to be allocated for unproductive economic and social activities, reducing the purchasing power of money or currencies.

decision to balance the interest rate at the institutional level of a market maker is legitimate, while subjects at an individual level also face the same problem. A bank does not know this explicitly, and neither does a financed business subject with an economic project or individuals at the inter-individual level. Whether or not this decision is relevant must be discovered in the bank's business processin a competitive environment. The same is very accurate on the individual level. During this discovery process, the bank in the free and competitive environment, in principle, faces three market counter-forces. The first is the withdrawal of commodity-money (gold) from the bank or even from the banking system by the marginal client. This is a reaction of marginal client sensitive to too much optimism from the bank about the interest rate or solvency development of its balance sheet. He stops being the bank's client and withdraws commodity-money (gold) either from the banking system as such, or from the bank and deposits it into another bank[38]. A client's decision could be motivated by the interest rate on gold deposits or by the value discount/agio over the fiduciary media, which shows the bank's solvency. The second counter-force is the marginal gold-miner, or any commodity-money producer, who is sensitive to the change of commodity-money interest rate and acts as a counter-force to sensitive gold-money holders. Banks buy the new gold as capital or try to attract new gold-money unitholders to improve its balance sheet, in order to mitigate the impact of the sensitive marginal client. The third is competition among banks (market makers) that use a relatively higher interest rate to attract new deposits, or have better financial results than a given market maker (bank): the currency of more successful banks has a higher value agio compared to the unsuccessful[39].

Therefore, the banking sector is like any other economic sector. In principle, it tries to estimate the demand for money in the same way as a tractor manufacturer tries to estimate the demand for his products. The tractor producer also tries to manufacture a marginal tractor to place on the market. The bank seeks to estimate the last possible (and lucrative) marginal exchange in the economic community. However the marginal exchange will not change the bank's clients' time preferences, i.e., the bank correctly estimates time preferences and, at the same time, the perception of natural interest in the community. This is not na easy task, and banks might err on their analysis. It is not possible to determine time preferences and a natural interest in a community[40] through questionnaires or surveys. The only option for banks in

[38] In principle, the client demonstrates that he does not want his commodity-money to be used as gold-money-reserves within the banking business focused on facilitating an additional unit of exchange. If he moves his gold-money to a different bank, he demonstrates that he does not want an additional unit of exchange to be facilitated under the conditions set by the first bank, and prefers another set of conditions created by a competing bank. If he withdraws gold-money from the banking system as such, the client demonstrates liquidity independence from the banking sector.

[39] In the context of lowering the interest rate, reservists use the cartel argument, i.e., all banks are mutually encouraged to lower the interest rate artificially. As we have shown, in a free system, this incentive faces three counter-forces, where at least the first two that we mentioned are not related to the cartelization of the banking industry and are entirely independent of the banking industry.

[40] From the question how to discover phenomena such as time preference and natural interest, it is interesting that at the inter-individual level, when a debt exchange happens between two individuals, it is possible to discover them in the same way, if these individuals enter the debt exchange. Until that happens, the phenomena are covered by a veil of subjective secrecy. The second interesting point is that, at inter-individual level, it is not at all possible to think about social time preferences or socially expressed monetary interest rate. At the inter-individual level, the phenomena simply do not

the market is to test what is and what is no longer acceptable to marginal clients, to monitor their behavior, and to evaluate their sensitivity to the bank´s activities.

The superiority of the fractional banking system over the 100%-reserve system stems from its ability to discover the marginal state of the economic system, concerning the coincidence of savings with investments, natural interest to monetary interest rate, and time preferences and plans. The banking sector also brings a higher degree of standardization of debt exchanges than the particular individual´s way of resolving debt relations. While the creditor faces the problem of estimating the success of the supported project at the individual level, the solution of problems related to the recovery of collateral, the legal aspects of debt exchange, is different in the banking sector. The professional banking sector provides much more efficient services in this area. Therefore, the attractiveness of using banking services and currencies should not be a surprising phenomenon compared to using commodity-money, even in politically controlled banking systems.

Fractional banking is another extension of the monetary layer of economic relationships, meaning that the spread of exchange faces more professional and specialized knowledge and entrepreneurship over time. This is because IOUs (currencies – either fiduciary or fiat) are clearable and tradeable obligations, depending on the solvency of the financial instruments against which they are created. Moreover, it is not about a particular economic project but about a portfolio of projects which the bank holds on its balance sheet[41]. Selgin (1998, p. 22) considers[42] this to be one of the most significant positive contributions of fractional banking. We need not use commodity-money; we are being much more effective. To the reader, it might seem that we are dealing with some superfluous solution that says we do not have to mine that much gold and save resources used on mining. However, let us look at the positive contribution from another perspective to realize its significance. Because any currency represents some kind of economic project that should produce something useful for humanity, it is as if economic goods provided a higher exchange rate between themselves without any need for commodity-money (gold) to be intermediary. From an economic point of view, this innovation can be compared to the invention of money itself.

3. Maturity mismatch problem

The issue of the maturity mismatch is mainly addressed in discussions between Barnett and Block (2009 a;b; 2015; 2017), Bagus and Howden (2009; 2010), Davidson (2014), Bagus, Howden and Huerta de Soto (2016), with the recent views on the problem by Němec and

exist. It is the institutional (monetary) character of the composition of a given relationships that allows usto consider the phenomena at the social level. This statement is quite controversial from the point of view of traditional Austrian approach; however, I think that the institutional level of these relationships enables to consider these very individual phenomena on societal level.

[41] This is Selgin's argument in the context of an incorrect regulation of the American banking sector compared to the Canadian banking sector.

[42] In this sentence, Selgin is quoting Wicksell.

Potužák (2019). Linking our research to a given discussion might not be ideal given the opinions of these authors over the influence of the fractional banking sector on the problem of the business cycle. We present the maturity mismatch leaning towards the works of Bagus, Howden, de Soto, Davidson (first group), who do not consider mismatch a problem. On the contrary, Barnett, Block, Němec, Potužák (second group) show that the maturity mismatch of the time structure of deposits with loans causes cyclical problems. We claim that the second group is more consistent. If fractional banks, by adding new monetary units, start the cycle, the discrepancy between the maturities of deposits and loans should have the same effect[43]. However, as we have shown above, the addition of a new monetary unit is related to discovering optimal interest rates that should reflect natural interest. The fundamental difference between the argumentation of both groups of authors and the one presented in this work is that the banking sector´s activities reveal phenomena such as the harmony of natural interest and monetary interest rates, the purchasing power of monetary units, and time preferences in the economic community. These are the results of banks' business processes. This is only partly presented in the works of the first group of authors, whose inconsistency, therefore, lies in the opinion that maturity mismatch is not a problem, but the operation of fractional banks causes cycles because it is based on fraudulent activities. We have to support this claim.

Barnett and Block (2009a, p. 711) asked the question "is it proper (for a bank or any other such institution) to borrow short and lend long? That is, suppose A lends B $100 for a year, B turns around and lends that $100 to C, but not for a single year, rather, for two years." The answer to this question is clear to them. It is inadmissible. They build their argument first by demonstrating that fractional-reserve-demand deposits are illegitimate, could not survive in a free economy, and are economically destructive. The argument appears on the example of cars in the community (mutatis mutandis money). If 1000 ownership titles are created for 1000 cars in the community, and someone adds 100 titles without changing the number of cars, we have a fraud. The same, mutatis mutandis, applies to money. The fraud would not last long in a free market. Banks implementing this type of activity would face a constant multiple-ownership problem. At the same time, this activity is linked to the start of the cycle, because banks push lower interest rates in this way than would otherwise be the case, causing an illusion of higher savings, which consequently leads to the economic downturn once economic agents realize that boom was artificial (BARNETT; BLOCK, 2009a, p. 711–712). Basically, Bagus, Howden, Huerta de Soto and Davidson will basically agree with this description. We see at the beginning of their works that they agree that fractional banking is fraudulent and cannot pass the free market test. Opposing opinions come only with the mismatch problem.

The primary argument against borrowing short-lending long activity in Barnet and Block (2009a, p. 713) appears in the following quote: "if A lends B a book for a year, and B lends

[43] The inconsistency of the first group is very well shown in Barnett and Block (2017). It is illogical to claim that fractional banking system is fraudulent, causes systematic economic errors and, at the same time, that there is no maturity mismatch problem. However, we must state that Barnett, Block´s consistency is slightly disturbed by points as "*maturity mismatched must be of sufficient quantity*" (e.g., p. 56). The problem is not about the *quantity*. We provide an illustrative dispute about principles. We are not describing reality in its complexity; so, the dispute asks for full consistency.

it to C for two years, B simply has no right to lend to C what he does not have what is not his." In principle, Barnett and Block show that maturity mismatch is the same as fraud; from their point of view, it is only another area of problem that complements the statements that fractional-reserve-demand deposits are illegitimate, could not survive in the free economy, and are economically destructive. Barnett and Block (2009b, p. 464) give more economic arguments. Let us quote their main argument in full:

> The essence of our thesis is that the inter temporal-carry trade, whether of the fractional-reserve demand-deposit type or of the (improperly matched) time-deposit type, creates time ex nihilo; that is, it creates out of thin air the period of time that constitutes the difference between the lending period of A and the borrowing period of C. But the efforts to bring about this logical impossibility result in the misallocation of resources of the Austrian business cycle type. Were it not for intermediation, the voluntary interactions of A and C in the market-place would increase the average term-to-maturity of loans made by A and a decrease in the average term-to-maturity of loans received by D. In fact, there would be, could be, no spread between them. However, as C's desired term-to-maturity decreased, they would not be willing to pay interest rates as high as for longer-term loans. Furthermore, because A's desired term-to-maturity increased, they would not be willing to accept interest rates as low as for shorter term loans. This would result in a decrease in forced saving and an increase in voluntary saving on the one hand and a drop in both investment and malinvestment.

As we can see, the argument is consistent in the context of their belief that the fractional system inevitably causes a cycle. It is in this area that several reactions have arisen from Bagus, Howden, Huerta de Soto, Davidson, whose essence is that banks can solve the essence of this problem - the discrepancy over time - through new deposits in a time continuum, and that there is, in principle, no reason why banks should systematically fail to do so in the free market. Their argument is based on simple examples of Robinson and Friday making new savings over time, in an argument related to the introduction of new savers into the description (BAGUS; HOWDEN, 2010, p. 66-69; DAVIDSON, 2014, p. 71-74) or that, while banks may fail in this matter in the context of individual business risk, these activities cannot cause a systematic boom-bust cycle in a market environment (see e.g., DAVIDSON, 2014, p. 74-78; BAGUS; HOWDEN; HUERTA DE SOTO, 2016). Arguments that certainly make sense, especially in looking at the banking system over time and how banks are efficient business units.

However, since Bagus, Howden, Huerta de Soto, Davidson, accept general negative claims about the fractional system, while claiming that maturity mismatch is not a problem within the banking sector (whether 100% or fractional), they defend a special position. For one, they argue that the fractional system is problematic because fractional-reserve-demand deposits are illegitimate, could not survive in the free economy, and are economically destructive. However, at the same time, according to them, banks could estimate their deposits correctly, not being condemned to fail. It is quite clear from the simple argumentation presented in Barnett and Block (2009a) that one is not entirely consistent with the other. Basically, if it is correct that fractional-reserve-demand deposits are illegitimate, could not survive in the free economy, and that fractional banks are economically destructive, then how is it possible that

only the time component of these activities in the form of "time ex nihilo" is not problematic, while all other characteristics of the fractional system are? We argue that the problem is not that Bagus, Howden, Huerta de Soto, or Davidson argued incorrectly about maturity mismatch. The problem is that their claims are not consistent with the classical perception of the fractional banking problem.

> That is precisely what we have shown in the first and second parts of this article. In the first, on the ontology of money and bank products (IOUs), a bank does not generate money per se but IOUs and, therefore, there is no fraudulent activity if the bank correctly reports the amount of its fractional (e.g. golden) reserves and the rest of its balance sheet in the form of sound securities. Moreover, as we have shown in the second part of this work, fractional banks do not begin any systematic boom-bust cycle. On the contrary, a bank tries to estimate the natural interest rate (i.e. the degree of willingness of creditors to provide resources to borrowers). In case of wrong estimates, there are enough competitive reposition forces in the market to force it to conduct its business as best it can to remain a sound institution. In other words, we cannot have any problem with maturity mismatch. Quite to the contrary, we are consistent with preceding parts of this work that this alleged problem (mismatch) is a vital essence that helps humans use savings within the economic community. Therefore, we will be on the side of Bagus, Howden, Huerta de Soto, or Davidson, but with different and more consistent, fundamental arguments. As we said in the beginning, we are going to look at the problem, once again, from a different perspective[44].

So, based on the argumentation above, we argue that, while the addition of a new monetary unit is related to the search for an optimal interest rate that corresponds to the natural interest rate, the so-called maturity mismatch problem is nothing more than the process of revealing the "societal" interindividual time preferences of participants within an economic community. Maturity mismatch is an activity closely related to the discovery of the monetary interest rate. Banks discover the extent of the spread between savings and capital goods through maturity mismatch processes. This statement needs clarification. How? We can describe the dynamics of the relationship between deposits (borrowing short) and loans (lending long) in the banking system and by describing the counter-forces that act in

[44] This different optic is demonstrated on the work of Němec and Potužák (2019). They show on the positive slope of the natural yield curve that natural changes in reallocation of savings (caused by the banks' clients themselves) cannot have a negative impact on the structure of production, generating a boom-bust. According to them, however, forced savings are caused by banks' efforts to take advantage of the "*price difference between short-term and long-term markets*" (given the positive yield curve). Banks cause this curve to flatten, giving the impression that clients' money is a long-term savings, consequently causing a sub-optimal transfer of resources to longer projects. So far so good. But, how do we know what is the optimal and suboptimal time rate of savings compared to the so-called natural level? Where and by whom is it given? How do individuals A and C without mediator B in the example given in Barnett and Block (2009b, p. 464) find it? In the first two parts of the thesis, we argue that the fractional bank is an effective evolutionary and legitimate business, being aimed at discovering the willingness to activate an individual´s existing capital savings, bought by money or currency by the borrowers of money or currency within the scope of their planned projects. In other words, until individuals or professional bankers do not test (estimate, determine, anticipate) whether their estimated monetary interest rate corresponds to a natural interest level, and for /how long bank clients are willing to lend their money and resources, we know nothing about the natural interest rate and time preferences besides the natural yield level not demonstrating anything about these phenomena. However, if, as done previously, we reverse the view on the banking sector, arguing that fractional-reserve-demand deposits are legitimate, fractional banks are an evolutionary improvement, and are economically constructive to the discovery of optimal interest rate and the exploration of time preferences, than it is possible to explain correctly the vitality of the maturity mismatch technique.

the unhampered economy on the entrepreneurial activities of fractional banks. However, the description should begin at the lower layer of goods.

In terms of comparison, then if there were no money, the banking sector would record the agreed production plans between creditors (owners of savings) and debtors (entrepreneurs seeking capital goods) from the beginning of the debt agreement until its completion. The agreements would include natural interest phenomenon and state time preference associated with the creditors' portfolio of assets[45]. The concept of savings (in the form of goods) that can potentially be used in the production process is a broader concept than that of capital goods per se, which is eventually used in the production process. Savings are not just explicitly deferred goods, or something that we do not use; it can be anything that a person controls and that they or someone else wants to use in the production process. In an extreme example, saving is the whole energy supply of the functioning of the human body, which lets man works a day without, e.g., water, and a few days without food. Existing savings become capital goods when part of them are used in the production process.

In a barter economy, the debtor is interested in providing a good to a creditor. Let us say that some debtor is interested in a hoe today, which he wants to use to cultivate the soil in an apple orchard. He needs it from spring to autumn to successfully harvest the apple crop. Alice is a potential lender - she owns a hoe; Bob is a potential debtor - he knows how to grow apples. Alice may want to lend the hoe to Bob only until summer (for three months). However, Bob needs it until the fall (for six months) to secure a relevant harvest and fulfill his investment plan (growing apples). Alice has to agree with Bob. Otherwise, everything is the same, i.e., Alice has her savings (hoe and other things), and Bob has to discover how to care for the orchards without a hoe, so he can grow apples. As we can see, Alice and Bob need to find the optimal measures for their agreement, which includes the phenomenon of time preferences and natural interest. Bob must persuade Alice to lower her time preferences, or find another neighbor who has a hoe and lower time preferences. Now imagine that a skilled negotiator enters the market – Charlie – who knows everyone in the community. Thus, Bob turns to him. Charlie promises Bob a hoe until fall. Charlie agrees with Alice to borrow a hoe for Bob. She will give him a hoe until summer. Charlie will lend it to Bob until autumn. As summer approaches, Charlie finds David, who is just as willing to lend a hoe, e.g., from summer to autumn. So, Charlie leaves Bob a hoe until autumn, and he returns the hoe to Alice in the summer. For the mediation, Charlie wants something in return from Bob - a share in the apples, which he also shares with David and Alice.

In the monetary economy, this direct relationship is only mediated by either commodity money or currencies in the higher layers of economic relations (monetary and banking). In principle, the savings are then equal (hoe loan from spring to autumn) with investments

[45] At this point, we should emphasize that it is possible to connect the expression of time preferences only considering the concept of portfolio. Portfolio, as we have shown above, is a homogeneous concept that allows comparisons over time. One can express time preference only by comparing two portfolios over time and considering whether reducing time preference does not jeopardize satisfying one's optimal combination of needs until the time of the closing of debt. By relativizing the importance of individual goods in the portfolio, we can, in the context of a combination of needs, increase/decrease a person's time preferences.

(hoe return to Alice + apples in autumn, as interest). When Barnett and Block (2009a; 2009b) describe the maturity mismatch problem, in principle, they describe precisely this relationship. Nevertheless, in a monetary economy, where they claim that the bank (Charlie), by allowing an investment six months in advance (until autumn), generated malinvestments, which can only be avoided through forced savings (Charlie must convince David, who might not have thought of lending a hoe). The key in the description is whether these are forced savings or not. As we intentionally mentioned, Charlie is a skilled negotiator who can manipulate anyone. The second group of authors should, in principle, say something like this, so we help them rise this potential argument about Charlie´s nature.

On the contrary, the first group of authors should argue that Charlies´ business depends on these skills. It may appear that David is deceived, and subsequently coerced, by Charlie's questionable skills. The moment he promised Bob a hoe for six months, he could not know if he would be able to convince David. If we describe the situation from this point of view, then the shift in maturity seems to be "forced." However, it is not so explicit. Furthermore, it is not even about whether Charlie is a good swindler. The arguments presented in this work do not conflict with Charlie's work. We argue that this is precisely how social time preferences appear[46], and that Charlie performs an essential social service - narrowing the spread between capital goods and savings that can be used as capital goods. In this case, Charlie provided the economic community with information about the extent to which savings could be used, how much of it could be converted into capital goods, and it could mediate the existence of a new investment plan.

Charlie's discovery process consists of two separate activities. The first is to uncover a good business idea (Bob´s idea) that will allow us to identify a natural interest rate. The second, which we can safely call the "hunt for savings," reveals the time preferences of the members of the community and the possibilities of using their savings in a given economic community. Of course, one depends on the other. But, at the same time, it is a different phenomenon[47]. Neither the bank (Charlie) nor the borrower (Bob) knows the time preferences of those who have real savings in the economy (Alice, David). Neither the bank nor the borrower knows

[46] It is possible to use different terminology as follows: "how inter-individual time preferences over time appear to the third party who observes the process" or "how many individual time preferences together over time appear to the third party who observes the process".

[47] At this point, we would like to remind you that whether the IOUs will be used to purchase the so-called capital goods or consumer goods, in principle, it is always a kind of economic activation of the goods in terms of meeting the needs of those who buy them. This act then provides feedback to their producers whether they have estimated today's needs correctly in the past. Only "today", therefore, it starts to be clear how reasonable the estimates were in the past. It is this time shift that implies the existence of cycles. In a politically unaffected environment, cycles are then flattened by high quality estimates and extended by poor quality estimates. However, without a business error, it is not possible to estimate the future. Political decisions also push the expansion of the cycle. However, this is another topic concerning systemic error. [At] the same time, this process implies the existence of the purchasing power of IOUs, which increases with the success of banking activity and decreases with the failure of estimates. It is also important to stress that maintaining this process over time implies the possibility of comparing economic activity over time – the process is the same in principles. However, the process has particular characteristics at the same time that were different 50 years ago and are different today and will be different in 50 years, which raises an interesting question about the impact of standardization of banking activity and rules of the banking process over time. It is also interesting to think about the political impact on the banking system within this perspective.

what the terms of the agreement would be otherwise in the context of the amount of interest if individuals would by themselves agree with the conditions. Even these individuals would not know if we asked them. Psychological investigation of the process will not help us. The only way to discover at the individual level or the institutional level is to establish an agreement between creditors and debtors. The given phenomena can only be detected by the "marginal test". Only later in the future, we will know whether that estimate was correct, and to what extent it was correct or not. Even if David does not give Bob a hoe on an individual level (without Charlie's interference), it does not mean that Charlie made the wrong decision about Bob, nor that he deceived David and "forced" him to something that he would not want outside of Charlie's offer. That is because the banking sector also provides many new benefits compared to the individual level in the form of standardization of products, higher acceptance of losses, different risk, recovery of collateral and receivables, or the legal status of things. On an individual level, David might not want to have anything to do with Bob. However, Charlie is a guarantee for him with additional benefits. That is why it is Charlie who negotiates, not Bob. Subsequently, it is only the competition of banks, their professional estimates, the rules of the banking system, collateralization, standardization of credit conditions, standardized investment, and financial products that create a market situation (unless the market is politically manipulated) showing the best possible estimates of the perception of natural interest. Furthermore, this reflects monetary or currency interest rates on various types of debt activities and their maturities and an estimate of the perception of time preference on how acceptable the intensive use of savings from a societal perspective is. Maturity mismatch is, therefore, how the banking system discovers time preferences in the community, directly related to the estimation of the natural interest rate as well.

The example given here, or the example of Robinson and Friday in Bagus and Howden (2010, p. 66-69) illustrates the principle of the maturity missmatch. However, these examples do not relate to the sequence of developed of the conjunctural history: 1. primitive debt relations, followed by 2. their complexity, evolved into the 3. effort to solve the complexity with money, followed by 4. new forms of complexity of relations because of money (direct imagination of interest rate), evolved into the 5. banking activity (institutional solution). So how it happened that we use the banking activity to discover natural interest and proper utilization of savings? In primitive communities, it is very likely that the activity between Alice, Bob and David was automatic. Bob was automatically entitled to a hoe (or whatever) which was part of the community's portfolio. Then, he contributed with apples (or whatever he produced later) to it. This was due to the nature of the community and the limited awareness of our predecessors. After money evolved, Bob no longer focused on Alice or David's hoe. He focused on Charlie's money. Charlie got them by selling some of his products before he an provide money to Bob. He lent directly to Bob, who bought a hoe for it. Charlie became a money-creditor. The lender (Charlie) provided liquidity to Bob. Bob made a debt to Charlie. In the case of Bob's debt solvency later in time (i.e., Bob successfully produced apples and sold them for money), Bob was able to eliminate his debt to Charlie (principal plus interest). The more successful Charlie was, the more attractive he is to Alice (with her money-liquidity) who entrusted Charlie with part of her money and taking care of providing liquidity "in her name." Charlie became a market

maker in the area of liquidity and debt market - a banker -, and began to build his business project – a bank. Alice then put money in a professional institution. Charlie was not the only banker. Together with others, he began to build a new structure for bank relationships. This was possible due to the nature of debt and money, where mutual debt relations could also be settled between other debtors and by each other over time and between institutions (bankers) over time without using commodity money directly. This was made possible by a product called - currency / IOU, which gained more liquidity than the commodity money itself.

Monetary economy is a more abstract layer of relationships that seems to be above the layer of direct transfer of goods; by using money, we give, technically, indirect orders to move goods in the lower layer. By starting to use commodity money, we anonymized the owner of capital goods in the system, creating a specialized position, a money-creditor, who provides to borrowers necessary liquidity. In a barter economy, the creditor was anyone who provided the goods to the debtor; in the monetary economy, it is only those who provide the commodity money to the debtor, and the debtor already buys capital goods from their owners for the money. In this way, the creditor specializes exclusively in providing liquidity to the debtor. At the banking system level, the process proceeds as follows. It is the borrower who creates a debt in agreement with the creditor. The creditor provides the credit. It has to be stressed that the act is of a dichotomous nature. Debt implies the creditor's loan; credit implies the debtor's debt. A credit expressed through an IOU / currency is the provision of immediate liquidity. Debt expresses the maturity related to its elimination later in time. The situation is marked not only on the bank balance sheet but also on the debtor's balance sheet.

The debtor records his debt on his liabilities. The bank records debtor´s debt on bank´s assets (let us say, in the form of a financial instrument expressing the factory that the debtor buys) and creates an IOU (currency) in liabilities, which banks give to the debtor; he may deposit it in his account in another bank or in his account in the lending bank. Let us say that he uses the provided currency to buy a factory. The debtor records the purchase of a factory on his assets, which becomes his property. The debtor has transferred currency (IOU) to the account of the owner of the factory. In this way, the owner of the factory building determines whether his past investment in the construction of the factory has made sense. By selling the building of the factory, he eliminates/does not eliminate past liability/credit, both recorded in the banking system and on his balance sheet, and assesses the rate of his profit/loss. The new debt/credit record in the form of an IOU has made it possible to eliminate the old liability/credit record from the banking system. What is also important is that our bank and our debtor only estimate whether the debtor's activity (factory) will be successful later in the future. We do not know whether someone buys products that will be produced in the factory in the future. Moreover, in order for an anonymous consumer to be able to buy a given product, he must also provide someone else with a product or service. What happens in the banking sector later in the future depends on the quality of the estimate of whether the debtor will be successful or not. If the debtor is successful, his debt/loan will be eliminated in the same way as the debt/loan of a person who has successfully sold a factory building today. The whole process of creating a new debt/credit is still at the same time at the level of estimates - an estimate of business success or error.

Although a particular bank in a particular activity only estimates the situation and estimates the situation on the side of time preferences, in the context of the banking system and the economic system to be viewed as a whole, it operates at the level of cumulative market information. As mentioned above, clients of a competitive market banking system have several options for influencing the estimates of free banks. Besides the processes mentioned above related to the free bank's marginal client, other related counter-forces prevent free banks from abusing the situation in a free banking system. It is the pricing system and the owners of real savings that indirectly influence the decisions of banks. They influence creditors' and debtors' behavior through a price system that determines the degree of intensity of savings in the community. As we have shown, the debtor, by obtaining credit (acquiring IOUs), buys some existing savings in the form of real goods, which become capital resources in his further economic activity. If the banking sector significantly overestimates the success of its estimates, the borrower will encounter some price limits that will prevent him from obtaining existing savings from their owners. Feedback from the economic community comes in the form of price changes related to the purchase of real savings in order to activate them in the economic community[48]. In this way, the owners of savings also express feedback on the estimates made at the level of the banking sector in the form of changes in the prices. The rise in ask money prices implies a rise in time preferences connected with existing savings and vice versa. Simply put, the bid-ask spread of goods (savings) will begin to widen in the market. The goods demanded by debtors are less accessible, forcing the activity of debtors to slow down. If the bank continues to ignore these factors in a competitive environment, this will begin to be reflected in the deterioration of the bank's financial indicators. Existing debtors would stop servicing their debt. However, this would subsequently cause the banks to lose clients. Thus, the system has interacting spontaneous counter-forces that ensure equilibrium and the search for optimal interest rates and time preferences. In an unhampered market environment, the bank solves the so-called maturity miss-match problem with new deposits of new clients, which in the context of the banking system mean only one thing - repayment of previously created debt and successful sale of products, i.e., meeting some other people's needs. Furthermore, this process is just being repeated over and over again—ad infinitum. Maturity miss – matched is a vital force.

[48] Posvanc (2019) argues in a similar manner, trying to solve the problem of interest. He tries to separate the three Bohm-Bawerk´s conditions for the existence of interest, which Bawerk calls the first-time preference, which is related to a different equipment of goods today and tomorrow, the second time preference, which is related to the underestimation of future needs and the third type related to the implementation of round-about production methods. Pošvanc (2019) argues that the first-time preference should be called the *time projection* and that it is directly related to the issue of interest. It is because we do not know the future equipment of goods, we are only able to project it. On the contrary, the second type of time preference is related to the allocation of savings and the typical perception of time preferences, where man prefers earlier to later satisfaction of needs. The third type of time preference is already the result of the first two, and respectively it is an evaluation phenomenon of ex-post assessment of the success of the production process that may have arisen from the first two phenomena

Conclusion – A fractional vs. a 100% banking system

The purpose of this paper was to show that a fractional banking system is not a fraudulent system and that it is an economically more preferred system to a system of 100 percent reserves. We have presented a non-trivial number of arguments to support this claim. This does not mean, however, that these two types of banking systems could not coexist, nor that new banks entering the free market could not start their entrepreneurial activity as banks with 100 percent reserves, later becoming fractional banks. These possibilities and conditions will be, in the end, determined by the clients of the bank and competing environment. Blaming factional banks per se for causing the economic cycle and violating property rights may give the impression that non-reserve banks are a kind of unnatural element in the economic system. Banking activity is a very significant economic phenomenon. It is precisely banking activity that allows to identify phenomena such as natural interest, social time preferences, or the rate of use of savings in the economic community. Based on it, it is possible to assess the efficiency of existing and the effectiveness of planned production structures (economic plans of people). Without banking, this would not be possible to such an extent, scope, and intensity. At the same time, the extent, scope, and intensity imply that information is continuously assessed and changes in their perception are always discovered. In the absence of the banking sector or the case of a requirement for a 100% reserve, the rate, scope, and intensity of the assessment would inevitably change, which would logically cause a higher degree of economic discoordination. Fractional banking cannot be blamed for causing economic cycles. In this paper, the banking system was introduced as a system based on exhibiting the entrepreneurial ability of the banking sector to manage credit-related socio-economic relationships. We think we have successfully shown that fractional banks are a vital part of economic relations, maybe one of the most important. It is therefore clear that any political influence on the banking system creates a situation that has very significant implications for the economic functioning of society.

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