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a demand for non-
consumable money is
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Abstract

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ABSTRACT. The paper explicitly discusses the key differences between a demand for consumables and demand for (non-consumable) credit money. For example, in contrast to consumables, money can not be demanded by only one agent; it is a stock variable; credit requires special arrangements to implement trust now to clear up a debt later; for a finite time period there is zero demand for non-consumable money (Hahn paradox). These issues are important for developing micro-foundations of monetary macroeconomics, including those for a liquidity trap and credit crunches, not well investigated in existing literature. Contemporary economic theory already has some answers, initiated by works of Martin Shubik. These micro-foundations are vitally important for understanding a credit crisis and credit cycle as interactions between real and financial sectors of economic systems.

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1. INTRODUCTION

There are two terms in economic theory, which exploit the word “demand”: “a demand for goods,” and “a demand for money.” This can make an illusion that these two demands are identical in their origin and nature.¹ However, even if economists more or less agree on “a demand for goods,” their consensus can hardly be observed over demand for money. The lack of consensus reveals itself in multiplicity of *ad hoc* money demand theories.² The lack of understanding of the issue can be demonstrated by the question: “the properties of demand for money are independent or not?”, addressed to the properties of demand for money after Keynes.³

A principle difference between a demand for money⁴ and a demand for goods can be easily illustrated. One can have a demand for a consumable good, being a single consumer (a monopsonist). However, one can hardly imagine a demand for money only from one agent; anyone claiming a demand for money assumes that it can be used later for a trade with others, who will also demand it.

It has been known from the 60-s of the previous century, that there is a zero demand for non-consumable money in finite time (Hahn, 1965, and later publications). This is the question, which most existing models do not focus on, explicitly assuming infinite time.⁵

¹The similar situation dominated in investments before 2008. Doubts could hardly be publicly revealed that AAA stocks, AAA bonds, and AAA mortgage-backed securities had different risks. Nowadays, it is accepted that similar notation for different risk securities was at least misleading, see Goodhart(2010).

²The excellent exposition of existing theories can be found in the textbook of Walsh (2017), or in Handbooks of monetary economics. Many of them are partially inconsistent with each other, target only partial equilibrium analysis, or are not consistent with empirical facts, different from those they were originally designed for. And they do not explicitly assume discussed further properties.

³If yes, then a theory addressing one property must be able to construct other properties, if not, this deserves micro-foundations.

⁴By using the term “demand for money” we mean demand for credits in fiat, non consumable money, without money already allocated across economic agents. This money at hand also have the property of a trustable good. We also do not address policies of a central bank.

⁵There is no technical problem for non-consumable money in infinite time, but there is no sense for holding such money in any finite time framework.

Hahn formulated the problem as: why to accept non-consumable money as a means of payment in the last period of life, if the world is finite. At the very last moment nobody will accept money as a means of a payment: money is non-consumable. By the backward induction we can deduce that no one will hold the non-consumable money from the very beginning, as finally no one will accept it.⁶

It is impossible to skip the multiplicity of existing models for money theory, credit theory, money holding etc, (Walsh (2017), and many other authors). The cumulative problem is not so much in their eclectics or an absence of direct answers for the above posed questions, or to the Hahn Paradox. The fundamental reason is the long-lasting divergence between value theories and monetary theory. Even the most sophisticated contemporary approaches to theory of money follow this trend.

The Hahn Paradox offers a validation test for reality of a theory. For a demonstration, we can apply this test for the popular search models, for example, Rupert, et al (2000). The model has infinite time, and the parameter γ : for $\gamma > 0$ an asset has positive return to a holder, for $\gamma < 0$ a negative. If $\gamma = 0$, then the asset is fiat money, as asserted by this class of models. If for this case money is consumable, there is no problem to implement finite time model, but the model does not claim explicitly that money is either consumable or not. Because it can not

⁶The relevant example, for the difference between non-consumable and consumable money was described by Leo Tolstoy in the volume 4 of "The War and the peace," chapter XV, the well-known episode of urgent evacuation from Moscow before entering of the Napoleon troops. A value of a dray in comparison to money has become so high, that a wealth was measured in drays (consumable, as vehicle, or a service, to flow away from enemies), and value of paper money and assets (non-consumables, based on a trust) have fallen down. Another example of what means non-consumable money, which loose value, may come from Haffner (1938), who described personal life experience during the notorious German hyperinflation in 1920th. On the day a father of the family obtained his wage (inflating fiat non-consumable money), all the family took a taxi, and immediately rushed to a market to buy storable food for the whole next month. One could use food as a valuable means of payment. The family wanted to spend money as soon as possible, before a purchasing power of money sank down further. Another classic example from that time: after a wallet had been stolen, banknotes were thrown away, but the wallet have been hold for the future.

operate with non-consumable money in finite time: the probability to pay a credit back, variable p in the model, collapses to zero. The search models with infinite time and $\gamma = 0$ fail to explain the Hahn Paradox, and do not supply an insight to an origin of demand for credit money.

The paradigm of thinking about money, competing to Keynesian one, was suggested by Martin Shubik:⁷ “Money is an institute of trust.”⁸ Trust to money is a fundamental for “the store of value property” of money. Loss of a value during a hyperinflation is directly related to shrinking of trust to the means of trade.

Money is demanded to settle a trade between individuals, to avoid a necessity for a coincidence of wants, resulting in a barter. Those, who accept money, trust it: it was issued by a trustable institute. Traders address the institute⁹ for a credit, which should be payed back. However, defaults/bankruptcies are sever realities of economic life, notorious in economic and social history. Much human experience can be found in fiction,¹⁰ historical literature, and memoirs. The coming reality of the vast 2020 world credit crisis¹¹ is able to put debts and defaults on top of the world economic agenda, besides coronavirus.

From a side of a lender, maturity of a debt is finite, and always expires. Neither lender gambles, everybody makes arrangements to guarantee a pay back. The demand to guarantee is supported by existence of institutes, as collateral agencies, credit history agencies, law system, and so on. The Shubik-Wilson (1977) model was the first to

⁷The contribution of Shubik to economic literature is profound and vast, but here we concentrate only on a narrow subset of his intellectual heredity, directly related to construction of demand for non-consumable fiat money. Shubik’s “Theory of financial institutions”, and the joint book with Thomas Quindt, “Barley, Gold and Money,” contains many undervalued ideas for developing micro-foundations of monetary economics.

⁸“In God we trust” is written on every dollar banknote, what emphasize the importance of the issue. The same idea is brilliantly explained in the book of Harary, (2015) history book, chapter 16.

⁹banks of shadow banking

¹⁰for example, “Gobsec’ by Balzac’

¹¹See further an explanation, what is meant by the 2020 crisis.

introduce a class of arrangements into economic literature. It is similar to those, described in Charles Dickens novels debt prisons, in the XIX-th century England.

In this short paper we can not review all the literature initiated by Shubik, and discuss many important open questions of micro-foundations for monetary economics. We narrow the task, and concentrate only on the differences in the two demands, how it can be overcome, including an approach, developing by the author, Levando, Sakharov, Zaytzev, (2019).

One may ask a question, what means the 2020 crisis mentioned further. The paper was devised and written, and later submitted at two different times of the world economy. By the end of the 2019, when the paper was written, a possibility of a soon big financial crisis¹² was already widely discussed, mainly by investment bankers; interviews are available at internet. At this time, a chance of a virus epidemic was beyond a big interest. The focus was on unsecured, never-to-pay debt burden¹³ of the world economy, and a soon collapse of financial markets. Some forecasts termed a crash as early as the end of the first quarter of the 2020.

The paper was submitted to this preprint during the pandemic of coronavirus, which itself has enormous and tragic impact on the world. Thus the virus has acted as an additional real-side trigger to already financially-vulnerable world economy. The world economy has met a combination of a real side (both demand and supply) shock, and multiple insolvencies of over-debt firms everywhere in the world. Meaning the 2020 crisis I will address mainly financial side of the crisis, amplified by the COVID-19 pandemic.

¹²And it is not considered as a "black swarm." The mechanism of unsecured credit doping is widely used. And it is not a surprise, that sooner or later the bills need to pay. Does an induced economic growth cover expenses to pay for debts? The fundamental question is to seek for systemic patterns, which gradually prepare a credit crisis. This paper argues, that a possible way for this research is in rethinking of a relevance of a transfer of our understanding of demand for consumables to demand for non-consumable credit money.. An accompanying paper on credit cycles discussed implications of this reconsiderations.

¹³The common mechanism with the 1929, 2008 and the current crisis.

This paper has two purposes. The first is to attract attention to the differences between the two demands, and briefly outlook, what is so special with micro-foundations for demand for money; what can suggest existing economic theory to resolve the Paradox of Frank Hahn. The second, to explain constructive answers for these questions based on Shubik-Wilson (1978), and survey our integration of credit, labor and goods market within the Walrasian economics.

The structure of the paper is the following. In the next section we explain difference between demands for good and money; in Section 3 we explain the approach of Shubik to overcome special properties of money. In Section 4 we explain a role of collaterals, based on the Shubik-Tsomocos paper. In Section 5 we suggest, how to introduce labor demand/ labor supply and production into the consideration. A Conclusion finalizes this paper. The next coming paper will use this material to discuss the credit cycle mechanism.

2. DIFFERENCES BETWEEN DEMANDS FOR GOODS AND MONEY

Demand for money is based on a tacit belief, that others share the same belief, and the sequence of beliefs can be infinitely iterated. An existence of demand for money requires a common knowledge (as a convergence of beliefs) of such beliefs, what in traditional words means that the same type of money is simultaneously demanded and accepted by everybody, without a hesitation. Thus, it would be bizzard to think about a monopsonic demand for credit money.

Another difference comes from the stock-flow difference: after a trade, money does not lose a value and stays in an economy. However, a consumable good loses its value and disappears in utility. The same in other words, money is a stock variable, accumulated from some date in the past, while consumption is a flow, attached to a specific date.

Mutual desire to hold money was summarized by Shubik's "Money is an institute of trust." This means that, no one will accept money, issued from any source, unless being sure, that in the future someone another will accept it, or being sure that will be able to use the money for a payment in the future. Those, who use money need to share

trust to the money emitter and each other.¹⁴ Usually one will accept a consumable good as a payment only in (or during!) some very special life conditions, like cigarettes or bean cans in prisoners camps, etc.

The difference between stock nature of money and flow nature of consumables matters more in a dynamical setup. Most approaches concentrate on dynamical money demand, designing multiple *ad hoc* dodges¹⁵ to treat money equally with consumables. The textbook Walsh or the Handbook of Monetary Economics expose many approaches on the issue.¹⁶

There is another facet for trust in money, in the dynamical setup.¹⁷ It comes from a differences of spot and inter-temporal trade, which is specific of money markets.¹⁸ Consumable goods are purchased, paid for, and delivered to, while a time gap between the stages is considered insignificant; it is a spot market. The credit market operates differently; there is an explicit time gap between accepting money in exchange for a I-Owe-You promissary note, and a final debt repayment, when the IOU receipt is payed. Credit markets are always inter-temporal markets, even if time gaps between issuing IOU and repayments are not pronounce explicitly.¹⁹ An existence of a time gap is crucial: a debtor may finally have no funds, temper a desire to pay the credit, economic environment can change. More of that, a borrower may take a credit, without *a priori* intention to pay it back.

Most such events are rationally anticipated by experienced banks and bankers. A bank *ex ante* constructs some tools to motivate a debtor either to pay back the credit, or to be more accountable in demanding

¹⁴The usual restriction is that holding this money is preferable to holding anything else as money.

¹⁵Just few from a varied menu: infinite time, bequest motives for holding money correlate current beliefs.

¹⁶The problem is not in multiplicity of models and a variety of views, but do they explicitly address the differences of demands for money and consumables, micro-foundation differences between holding money and goods.

¹⁷It would be fair to mention that some of existing models of money address trust in a dynamical setups, what is relevant for both non-consumable and consumable money.

¹⁸we concentrate only on credit money, not on a policy of a central bank.

¹⁹Like in IS-LM-BP models.

a credit. These mechanisms include not only an interest rate, as an inter-temporal price of money, but also other non-publicly observable arrangements, like credit requirements, personal credit scores, credit histories, collateral conditions, actions of collector agencies, etc. These supplementary details are rare at most spot markets with consumable goods, where a trade is described by a price. This makes another difference between spot and inter-temporal markets.

Plenty institutes have been designed to manage a demand for credits and its consequences - from serfdom for debts and debt prisons to contemporary collector agencies. Somewhen personal and family freedom; today, mortgages and security deposits - different arrangements serve the same goal: to guarantee loan payments or compensate a loss to a creditor.

Importance of these arrangements can not be undervalued, they support implementation of trust in an economy. Over-optimistic trust and credit policy result in later financial insolvencies. The common topic of the current news is a comparison of 2020 crisis with not the 2008 crisis, but with the Great Depression, notorious for generous non-secured credits, what was observed for the last years too.²⁰

So, a simple question on the differences between the two demands guides us to another: how to construct a consistent micro-foundation?

3. DEMAND FOR CREDIT MONEY: SUGGESTION OF SHUBIK AND WILSON (1977)

The first practically relevant approach to construct micro-foundations of a demand for credit money was suggested by Shubik and Wilson (1977).²¹ Their model exposes the new mode of thinking about demand for credits in terms of non-consumable money: default as an

²⁰For example, at financial markets CLO have changes mortgage-bases securities.

²¹It is a static model, but it can be made dynamical.

equilibrium phenomenon.²² First, they suggested to operate with non-consumable money in one period model, what resolves the Khan Paradox.

Presence of non-consumable money radically changes a utility function, consisting of real part and a punishment parts. The real part has a traditional construction, transformation of a quantity of consumable good into a payoff. The second part captures the idea of approach.

If (positive) *money* is left after a trade, then it does supply zero utility, as money does not have an intrinsic value. But, if a *debt*²³ is left after a trade, then an agent is exposed for disutility. The disutility depends on a debt, and is proportional to a punishment for default, a parameter of the model.

Money is not directly present in the payoff function, but only as a debt. Non-paid debt delivers a negative impact for an agent, and may change a demand for a credit. Technically, a payoff function has a kink and discontinuity of a payoff function.

Second, Shubik and Wilson suggested to use a punishment for default, as a tool for a lender to impact a rational choice of a borrower. They present the following argument: if a punishment for default is infinite, then it will suppress an individual demand for money. From another side, if the punishment is negligible, then a demand for credit money explodes. Thus, implementation of inevitable punishment is a way to motivate a borrower to pay credit back *ex post* through *ex ante* bounding a demand for credit. An alternative for a borrower to avoid any repayment is always worse.

The model is constructed as follows. There are two types of agents, the continuum quantity each; the types differ by endowments in two consumable goods. There is no barter, and to start a trade the agents borrow money from a bank through a credit market. The bank is a unique supplier of liquidity, which does nothing except supplying a

²²This matches a banking experience - defaults always exist. And the same experience says, that it appears not only from fraud, but by many other reasons, as the unveiling 2020 crisis demonstrates.

²³or a negative money holding.

fixed quantity of money, and imposing punishments for default. It does not have a special payoff function, and operates as a strategic dummy.

Every time agents solve a simultaneous optimization problem with a kink payoff function. It's two parts correspond to two regemes: to pay back credit or not. Non-continuity of payoff function results in impossibility to implement the differential calculus toolkit. A solution consists of 4 cases, each depends on values of the punishments imposed on every agent types. The cases do not have continuous transition from one case to another.

The first case does not has a default, it corresponds to the classical, money neutrality case. It occurs, when the punishments are big, the agents are cautious to take credits. For this case, marginal utilities from consumption are bigger, than for not paying the debt.

The three other cases contain default as part of an equilibrium, without any outside shock. These cases leave space for someone to over-borrow²⁴ due to individually rational greediness for loans.²⁵ In one case, when punishments are low for both, and agents are so much rationally greedy, the economy occurs in the Prisoners's Dilemma with defaults for everybody.

It is possible, that a total volume of default exceeds money, supplied as credits. This happens due to competition for loans (unregulated greediness) of agents: an interest rate does not depend on individual demand for loan, but on an aggregate one.

Shubik-Wilson, (1977), and the strand of literature after them, have not concentrated much on dynamics.²⁶

²⁴what is induced by low punishments for default.

²⁵In reality, a choice is individually free only in economic theory. Market "animal spirits" are well orchestrated by advertising budgets of multiples interested parties, see "Engineering of consent" of Bernays (1923), considered as the founder for contemporary marketing, PR and GR. Thus a borrower's choice in practice is hardly free and rational, but severely induced and manipulated by commercial propaganda and advertising.

²⁶By dynamics we mean not a game in extended form as in Shubik (???), but some dynamic evolution, when every next stage follows after a reallocation of resources from a previous.

4. LIQUIDITY TRAP AND “MONETIZATION OF AN ECONOMY”

Deficiency of understanding of a role of demand for money is an implicit part of the long-lasting discussion, how much money an economy needs.²⁷ A suggestion for an explicit discussion was originally proposed Shubik, (1985), and partially developed Shubik, Tsomocos (1992). There are three different cases, differed by initial allocation of wealth, including real goods and money,²⁸ and they are tightly connected to wealth distribution. The March 2020 leap of US unemployment claims, when millions of people were deprived of current income demonstrates importance of wealth distribution.

The first case takes place, when every individual has enough money to pay for any equilibrium purchase for a given price. An existence of trade does not need an injection of additional money into the economy. Even if money is individually desirable, no one can be made better off by increasing money holding without making somebody worse off in terms of a budget constraint.²⁹

This case is equivalent to “money neutrality,” when everybody has a change in quantities of the money in a proportion equal for everybody. Then all the change in the quantity of money is transferred into prices.³⁰ This case can be disbalanced, if new money is allocated in not-uniform proportion.

This case is also related to the phenomenon known as “a liquidity trap,” claimed in most macroeconomic literature as an empirical fact without a clear reason. Informally, a liquidity trap takes place, when a central bank injects money into an economy, but can not impact an interest rate: freshly injected money is transferred only into prices.³¹

²⁷This motive often appears in discussion for expansion of credits.

²⁸At the moment his approach is static and does not go beyond one period consideration. This includes lack of production (see further) and a growth of production. Issues of trust and accountability for credits stay equally important.

²⁹Said this, we mean to exclude the substitution effect.

³⁰Money neutrality is known for centuries, see for example, Hume (1752) .

³¹The case, when freshly injected money is transferred into prices of securities operates similarly. This is the effect of the QE policy, given high inequality of wealth. Studying this effect requires further development of Shubik’s model.

Individual rationality for the liquidity trap was described in Shubik and Quindt, (2014), without connections to macroeconomic literature.

The second case takes place when someone does not have enough money to pay for equilibrium purchases, but still there are those, who are able to pay. Here, financial intermediators appear to reallocate money from those who have not spent money to those, who do not have enough money. Those, who can not pay for goods, have a demand for money, but there is still no need for injection of money into an economy, as it can be, at least theoretically, reallocated.

Demand for credits, as it was said above, requires introduction of special arrangements to pay loans back. If people do not have trustworthy collaterals, reliable mortgages etc, then, they are excluded from all markets: they can not take credits or loans, they can not purchase basic goods.³² This is credit rationing, known from papers of Stiglitz, which leads to exclusion people from financial system. The approach may see mathematically attractive, but socially is can be very undesirable. People, not impersonal economic agents, want to eat and live, what will further impact their incentives and motivations for thinking and acting; they can implement intentions, going far beyond mathematical elegance of economic theories.

The third case takes place, when everybody in the economy does not have enough money to pay for consumables. This is the case, when money is required for everybody, and there is a demand for someone, who will have publicly admitted trust to issue money.

At the moment very little is known about relation of these cases to real economic growth, to accumulation of debt, etc.

There is a common property of the last two cases. In both, there are credits to consumers, what has an impact on a number of those, who are able to purchase consumables. From one side, this has an impact on inflationary expectations, from another, this is the tool to push up

³²According to the NYCity report, in 2017 at least 16% of citizens did not have bank accounts and were excluded from financial services. In February 2020, before the blackout the low level shops and restaurants were made obliged to except cash, following Philadelphia and some other US citiies.

an economic activity. Credit demand by change real expenditures. The danger here is that a boarder between pushing an economy into a credit boom and a revitalizing real activity is fragile. More on this in the next paper.

In practice, one can hardly discriminate between cases two and three, and economic reality operates as complicated interactions between central banks, who pursue own monetary and credit policies, along with banks (including shadow banking), which pursue their credit policies. Thus final allocation of money results from interaction of money injections from two classes of sources, banks and a central banks, while only the second has responsibility for prices and monetary stability.

From time to time appears a discussion on an optimal monetization level of an economy. Someone from a country with low monetization claims that it is possible to increase supply of credit money, comparing volumes of credits to values of GDP with that in other countries. The approach of Shubik hints few ideas for an evaluation of this claim: one should first investigate inequality of wealth reallocation, implementation of trust arrangements.

There is another problem here. The countries, which were used to considered as benchmarks for credit policies, have met low and negative interest rates since 2019. More of that, the on going 2020 crisis is directly related to excessive debt burden in most world economics, used to drive the world few years earlier.

Coming back to the topic of the paper, a demand for credit money in an economy depends on initial distribution of wealth. Studying a relation between demand for money and wealth allocation is the important practical issue.

5. COLLATERAL APPROACH OF SHUBIK-TSOMOCOS

In an economy with 100% collateral,³³ a requirement to pay the debt is not strict, a bank can always capture the collateral to compensate

³³Full liability

a loss.³⁴ Nowadays the dominating trend in banking is fractional reserves approach,³⁵ when a collateral can not cover a loss from the very beginning.

Shubik and Tsomocos (1992) have investigated a role of fractional reserves from the micro-foundations of demand for money of Shubik-Wilson. They assumed that credits, issued in paper currency, are secured by deposits in gold. Quantity of the issued credit money is a multiple of the gold held, what is equivalent to fractional reserve credit policy. As usual, gold as a collateral improves trust between a lender and borrower, it can be used to cover a loss from borrowing. An alternative way to construct fractional credit policy, is capturing assets, (Shubik, Dubey 1988). However, resolving one problem, the models generated a new one, how to value the collateral. The 2008 collapse of the real estate market was just a case.

Shubik and Tsomocos studied the following situation, there are two types of agents, who make a mutual bank. Agents deposit gold from initial endowments, and borrow money from the bank to trade with cash. Each agent can be a depositor and a debtor (borrower). Agents use credits to pay for purchases trade, and make to pay for credits. Everybody can have a default after a trade. Motivation to avoid too much borrowing is described by a bankruptcy penalty.

Payoff functions are constructed in the same way as in Shubik-Wilson. The model concentrates on the simplest case, when *ex ante* interest rate is equal to *ex post*, what excludes strategic default cases.

The model of Shubik-Tsomocos is a game in extended form with complete information, but even for this setting it is already very complicated. It is a rare model, able to generate a deflation and default in an equilibrium. The potential of the model and variety of outcomes is still undervalued.

³⁴This does not eliminate a prudence for a lender. History knows many frauds with collaterals. For example the notorious frauds Golden Boos, Salad Oil were based on fake collaterals. See Davies, 2019.

³⁵It appeared in mid-XIX-the Victorian England.

6. INTRODUCTION OF PRODUCTION WITH CASH-FLOW IN NON-CONSUMABLE MONEY

Shubik and Wilson studied an economy of pure exchange, i.e. a trade from endowments. However, most people have income not from endowments, but from labor income.³⁶ Studying labor income requires a production and a labor market.

A synthesis of labor, production and credit markets is done in Levando, Sakharov and Zajtzev (2019). They expand the general equilibrium framework of the Shubik-Wilson model by enriching it with a labor market in the sense of Becker (1964).

Non-consumable money makes a complication for studying a firm. From one side, a firm maximizes a cash flow; from another, an owner of the firm can not be interested in holding money without an intrinsic value.³⁷ They authors suggest to resolve the conflict in a managerial style from corporate governance.³⁸

Levando, Sakharov and Zajtzev study a general equilibrium model with a fixed production, a production requires participation of an owner as an entrepreneur and a worker. An owner (manager) enjoys time of the hired worker and a consumable good, while a worker enjoys leisure and consumption. There is no barter, and both types of agents need cash to pay. The owner of an enterprise needs cash to pay a worker for a labor time; the worker needs cash to purchase a consumable good. Both can use money to pay for the credit.³⁹

Besides workers and firms, there is a bank. The bank supplies liquidity to the economy in a form of non-consumable money through a credit market. Demand side of the credit market consists of workers

³⁶Also savings, which are formed from labor income. However, the 2020 already demonstrates that a big part of population has very little savings and pay from current income, or credits.

³⁷Maximization value of a firm is also related to this issue. Stock-holders are finally interested in this value in terms of either consumption, or reinvesting.

³⁸or behavioral approach.

³⁹Another option is to maximize purchasing power of money in terms of goods, This approach does not contradict one, offered in our paper.

and firms. At supply side, there is a bank, which supplies a fixed quantity of money.⁴⁰ Money is valuable for a worker and a firm, as far as it can be used for pay for a purchase of a consumable good, as a wage and for credits. Money is supplied through a credit market, where an interest rate is formed. Holding positive quantity of money after a trade is useless for consumption,⁴¹ but left as debts induces losses for borrowers.

The suggested model contains three Walrasian markets: for a consumable good, labor and credit, respectively. Markets are characterized by wage, price and interest rate. The model has default as an equilibrium, so an equilibrium is characterized by: wage, price, interest rate and default, totally four variables.

Defaults on debts emerges as in the Shubik Wilson model. There are 4 different cases in the model, as in Shubik-Wilson model. Within the original framework, the paper demonstrates interactions of financial positions between a financial institute and it's borrowers: it numerically demonstrates the existence of a spill over of default from a borrower (a firm) to a creditor (a bank).⁴² The innovation of the model is the ability to study interactions between investment result of a firm (measured as Tobin's Q), and it's interaction with credit and labor market. The events of 2008 and 2020 demonstrate importance of interactions between financial positions of firms, credit and labor markets.

The model targets to the cases, recently described as “liquidity in the world cannot compensate for the collapse of real-world economic activity,” (Karabell, 2020).

7. CONCLUSION

The paper addressed the question, appearing at the early stages of studying economic theory: is there a difference between demand for goods, which are consumable, and demand for credit money, which is

⁴⁰As in the Shubik Wilson model.

⁴¹The same in other words, money has no intrinsic value.

⁴²This issue was not discussed in Shubik Wilson paper.

usually non-consumable. Refinement of the differences leads to better understanding monetary economics and its micro-foundations.

The seminal claim of Martin Shubik, “Money is an institute of trust,” can serve as a starting point in this journey. Applying his approach to demand for credit money, we can observe that, existence of monetary loans, and time gaps before repayments of loans require special arrangements for trust between a creditor and borrower. A tool to implement the arrangements was suggested as a punishment for default, Shubik and Wilson (1977). Doing this step, they suggested to admit default as an equilibrium phenomenon, what matches financial and banking practice.

Mortgages and collateral constraints, studied by Shubik and Tsomocos, (1991), is another way to guarantee loans, reallocating solvability of a debtor to a market of collaterals. Their paper is the seriously undervalued direction of research.

Better understanding the differences between the two demands can help to understand a liquidity trap, known more as an empirical phenomenon. Open economy liquidity trap seems today more like *terra incognita*, but Shubik has suggested the investigation tool.

Recently Levando, Sakharov, Zaytzev, (2019), expanded the Shubik-Wilson model to study interactions of the three main markets - goods, labor and credit markets. Their paper demonstrates importance of defaults for labor market and investment analysis.

These steps are the important pre-requisites for understanding a credit cycle, as an interaction between real and financial parts of economic systems. The questions, asked here, are not purely theoretical, but they can serve to understand the events behind of the current 2020 crises.

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