A PROPOSAL FOR A REPRESENTATIONAL THEORY OF CAPITAL

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> «The *sine qua non* of producing capital goods is *saving*, or the relinquishment or postponement of immediate consumption.»
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> (Huerta de Soto, 2006, p. 273)

INTRODUCTION

An interesting insight about money is that it is just a veil covering the actual economy; or, in other words, that there are actual goods and services in the real world and there is a monetary side that in one way or another represents, in an abstract form, some of the things that exist in the real side of the economy. Such representation is never perfect, for reasons that we may discuss; but also, some ways in which this representation is done are better than others.

But better in which sense? Well, better representations of what actually exists and a representation that better serves the function financial and monetary instruments perform for society. Note that some monetary institutions are particularly designed neither to do a good representation of the economic realities of society, nor to fulfill the purpose for which money was first developed, but to serve the interests of whoever has the political power to impose such arrangements. Be that as it may, a fact remains that different

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money and banking arrangements will represent more or less accurately stocks and flows of goods and services on the real side of the economy, and more than that, that such representation has consequences in terms of the allocation of resources in the economy.

STATEMENT OF PURPOSES WITH THIS RESEARCH

The main hypothesis suggested with this article is based on the assumption that capital has a dialectic nature, with existence both in the "real" and in the "abstract" side of the economy. With this article, it is argued that to consider capital "goods" as represented by property claims help us to solve some of the epistemological limitations on the subject. This article is meant just to be an initial *salvo* about a "representational theory of capital." Such initial statement is done by discussing the many different arrangements about money and banking that exist. Also, it is argued that to be able to classify them in a coherent theoretical framework is essential to be prescriptive about the best ways to achieve the purposes of having good money as an auxiliary instrument for the formation, accumulation and distribution of wealth.

With all of that, it seems, an aspect of capital theory that deserves further clarification was found, namely, the relation between capital and private property from an interdisciplinary perspective of philosophy, law, and economics.

REFERENCES IN THE LITERATURE TO THE IDEA OF REPRESENTATION

In regard to the idea of representation of capital, we are sitting, mostly, on the shoulders of Searle, Bohm-Bawerk (1962), Rueff (1964), and Lachmann (2007). Searle, for its general framework, Bohm-Bawerk for being the first to discuss the relation between capital and property rights, Rueff for his theory of false rights in order to explain inflation, and Lachmann for the implicit use of the concept in his formulations.

As noticed by Steven Horwitz, John Searle's work offers a good departing point to explain the idea of "representation" of reality in relation to capital. It is useful, but it is not complete or even accurate. Still, the distinction between brute and institutional facts, between the physical and chemical reality and social reality, gives context to the understanding of capital proposed here. What capital goods are (whose answer is to be part of a productive process to create more goods and services), and what financial instruments are (whose answer is property claims with special features which potentially enable them to become more easily tradable than other property claims) become easier to understand (although not completely) against the background provided by Searle's *The Construction of Social Reality* (1995).

Specifically, about the two main categories in which we may categorize capital, namely, capital goods and financial instruments, it seems an interesting departing point for our studies to consider whether financial instruments are an independent feature of the economic life and not related with the things in the real side of the economy used to produce more goods.

After all, the idea of an interdependent analysis of a real side of the economy and a financial one in itself may be questioned. It is conceivable to see financial instruments simply as the present value of streams of revenue, without regard to the source of the revenue;[1] furthermore, if there is a relation, the information about what this relation consists of may not exist.

Tentatively, one may dispute that by recurring to a simple historical example; still, considering the possibility that financial instruments are independent entities from real goods in the economy seems important to our understanding of capital theory.[2]

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[1] Horwitz answers the question about how social institutions can be real by referring to Searle and saying "social facts are facts because people believe they are facts" (Horwitz, 2009, p. 76)

[2] To call attention to the limitations of Searle's requirement of "collective intentionality" for the creation of institutional facts such as money or other financial instruments, Horwitz states "(I)t is not the performative that creates the reality; rather it is the process by which that practice has been accepted that creates the institutional reality. The sort of explicitly performatives that Searle uses in his money example are

The link between the rent of a property and a financial instrument such as an annuity is easier to see at the beginning of capital markets. By selling the right to the income of a property through a transferable instrument, the link was created between actual property and actual income with a financial instrument representing a claim over that property equivalent to its income (Kohn, 99, p. 6).

A clear example of an equity investment prior to 1600 CE is the one of a single ship voyage *commenda* (partnership). The passive investor in the partnership receives a share of the proceeds of the enterprise once and if the ship comes back. That seems to exemplify clearly the connection between the real side of wealth creation (a percentage of the amount of resources invested in the sea voyage plus the profits generated once the merchandise is sold) with the abstract claim representing it, that is, the share representing the passive investment in the partnership (Kohn, 99, p. 17).

THE SOCIAL RELEVANCE OF CAPITAL THEORY

The fact that the representation of the real side in the monetary side has consequences for economic performance explains the social relevance of capital theory. Even acknowledging government intervention in our lives, we live in an open society, in which most economic relations are impersonal, in which exchanges occur in a free market legal and moral framework, guided by the price system[3]. For those, who consider individual human flourishing as the ultimate justification of the political order, the open society and the market economy supporting it are extremely important instrumental moral goods.[4]

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neither necessary nor sufficient to create the institutional fact of money, and this claim holds true to institutional facts in general" (Horwitz, 2009, p. 81).

[3] This approach to understand the economic activity of a given society seems valid to the extent that it has a monetary economy. Of course, there are risks in bundling market economies with the likes of the former USRR and today's *Chavista* Venezuela. However, just defining a threshold at a certain point in the continuum along the line that market institutions are in place in order to differentiate societies with market economies from socialist ones may remedy that.

[4] Horwitz explains how the special way in which we organize production and the development of our understanding about reality makes our lives better by saying:

In the same way that a better understanding of the philosophical fundamentals of money may help us to come to more adequate monetary arrangements, a clear understanding of what capital is and how it is represented in financial instruments is a necessary condition to create an institutional setting in which most, if not all, individuals can prosper sufficiently fast to accomplish their goals in life.[5]

Significant economic growth (measured in terms of fast growth in income per capita), arguably, is the greatest source of legitimacy of the open society and the market order under a limited and representative government at the core of what we understand for liberal democracy.

Because some of us prefer, from a certain perspective, to waste our lives indulging in low taste pursuits, we must not forget that it is the fantastic wealth created in the extended order by allowing individuals to pursue their own ends that allows all of us to benefit from the advancements of applied science to our lives and to enjoy the refinements of culture and the arts. A well-balanced life worth living is a life which requires action in this world and the productive capacities we enjoy today, thanks to the capitalist system, result in the wonders that are available to us, whatever our preferences are, to be the best individuals we want to be.

MONETARY DISEQUILIBRIUM AND CAPITAL THEORY

In order for the "price of money" to remain stable, that is, in order for its purchasing power in relation with all the goods money can buy to remain stable, by definition, a point as close to an equilibrium as possible between the money supply and the supply of all

– "Following the rules of payment and contract, allows us to manipulate the physical world in ways that enhance our lives. More generally, innovations that have made human life longer and better are the result of the interconnected constitutive rules of the market and science" (2009: 79).

[5] The relevance of capital theory can be perceived in the practical consequences of its application: - it makes a difference for the economy, for instance, which financial instruments people invest their savings in, and knowing what they represent is a useful tool to make those choices at an individual level.

goods should be reached and such “price of equilibrium” should exist as mediated by changes in the demand for money as a liquid store of value. So, money and other less liquid financial instruments have an immediate quantitative relation with goods in the economy that are readily available for multiple uses and that are in part inventories and perhaps even fixed assets in the structure of production. Money and other less liquid financial instruments may also have a qualitative relation with those goods, in the sense that the amount of very liquid financial instruments ideally should represent the sum of the most readily disposable goods, while the amount of less liquid financial instruments should be related to the availability of not so readily disposable ones and so on. Yet, it is worth exploring whether the stock of money and financial instruments with monetary properties also have a mediate quantitative relation with all the goods transacted in society, not only capital goods, in a given period of time, under “existing” circumstances of demand. What is meant by that? At any given moment, there is a constant “aggregate demand” in the economy and a demand for cash balances, as well. That “aggregate demand” is not only for capital goods, it is for goods in general, actually the most important component of the demand for economic goods is the demand for consumer goods, whose production is the end goal of all economic activity (Huerta de Soto, 2006, p. 267). So, the economic agents need not only a certain amount of money to clear the transactions they are engaged in the process of production, but also to keep their level of consumption, from the flour used daily by the bakers to the turbines used to produce electricity, from their groceries to their homes. Since the frequency in which homes and electric turbines change hands is not the same as the frequency in which flour and groceries are traded, the stocks of monetary and less liquid financial instruments should vary accordingly. The demand for cash balances, to the extent that a substantial portion of the stock of money is endogenously produced, may be defined by the opportunity cost of holding interest generating financial instruments (bonds) instead of money substitutes generating less income or no income whatsoever. If changes happen in the aggregate demand, with economic agents revealing their preference for holding cash balances not only by moving from income generating financial instruments to monetary ones, but also by refraining

from buying goods, the result is that, since the stock of money proper exogenously supplied is constant in the short run, the demand for endogenously supplied money substitutes will increase and that movement will be counter-balanced by both a reduction in the price level of goods and an increase in the interest rate in financial markets in order to slow the movement from income generating financial instruments into quasi-money ones. So, the price level, or the purchasing power of money, as the relation between the stock of money and all goods in the economy money can buy, is related with:
- i) the relation between the stock of money and capital goods in the real economy; ii) the relation between the stock of money and other financial instruments; iii) the rate of interest;[6] iv) the speed in which exogenous money could be supplied; and v) the transaction costs for the supply of endogenous money. According to Klausinger (Hayek, 1999, p. 28), Hayek explains those relations in equilibrium recurring to the concepts of relative prices and the interest rate of equilibrium. Since Hayek's departing point for his theory of the business cycle is a hypothetical condition of equilibrium, in such condition, there is an existing structure of production and a set of relative prices that allow the continuation of the production of consumer goods and the use of funds for the maintenance of the existing capital goods indefinitely. That happens thanks to the fact that those relative prices signal to the economic agents that they can earn the rate of profits of equilibrium (which is the same as the rate of interest in equilibrium, that is, the natural rate and the rate of interest on money) by continuing to do what they have been doing. So, the spontaneous coordination among the economic agents in order to remain in equilibrium happens as a response by each of them to the relative prices of the goods and services in the economy and the profit opportunities that such prices allow.[7] We may add more realistic assumptions, such as envisioning an economy always trending towards equilibrium without ever reaching it, with relative prices changing in response

[6] At this moment of the investigation, let's assume that the natural rate of interest, the one that reveals the intersubjective time preference of the economic agents, is the same as a "core" interest rate on money that is the main component of all different interest rates on money practiced in the market.

[7] See also Huerta de Soto, 2006, p. 284.

to changing circumstances, being that the technological level, the institutional framework, etcetera; but a fact remains that the profit opportunities in the economy in general tend to harmonize (with new entrants and some agents exiting marginally particular industries in response to the current relative prices) the rate of profits in the economy, and with that, the allocation of capital to the production of the goods and services demanded at any given time.

WHAT DO THE STOCKS AND FLOWS OF FINANCIAL INSTRUMENTS ACTUALLY REPRESENT?

Back to the subject matter, not all goods and services are directly represented in the stocks and flows of monetary and financial instruments. So, an interesting question is, after all, what those stocks and flows actually represent. A tentative answer may be that money and other financial instruments represent a portion of the existing goods and services in the economy that: - i) are being saved to be used as instruments to current purchases (liquidity on demand); ii) are saved to be used as instruments to unexpected purchases we may not foresee exactly which they may be (short, medium and long-term liquidity); iii) are being stored for or are in the middle of the process of production as intermediate goods and services (working capital); and iv) are assigned to the production and distribution of final goods and services (fixed capital).

There are many forms in which the financial instruments representing those goods may take shape, for instance, they may be (but are not necessarily limited to): - money, warehouse receipts of deposits (warrants), bank deposits (both on demand and time deposits), shares of money market mutual funds, public traded notes, bonds, stocks, and derivative instruments. If we accept tentatively that list of goods, which are represented by financial instruments, and that list of those instruments, a question that necessarily follows is whether there is a relation between certain goods in the former list and certain instruments in the latter.

It seems that there is a link between the different levels of liquidity of financial instruments and the time to mature the return of capital investments they represent; that link may well pass through

the level of certainty about the return of the investment. A capital investment that requires many stages of production yet to be completed in order to generate a consumer good (a first order good in Menger's terminology), that then needs to be sold and the sale's proceeds received, is subject to many uncertainties, not only given the time required for the investment to mature, but also given its possible complexity. It is only at the end of the process that the result of the investment is known whether or not it paid off as expected. The consequence of such reality in the instruments representative of property rights over the processes of production is that claims over the lengthiest and most uncertain processes tend to be "close end" forms of investments like stocks that cannot be cashed out, only re-sold; they also tend to be "last claimant" investments, that is, once everyone else is paid, what remains of the proceeds belongs to the owner of those titles. On the other hand, shorter and less uncertain processes may well be represented by instruments which entitle their holders to cash out their investment after a certain period of time and, in many cases, at a certain rate of return, such as fixed income investments like as corporate bonds.

A THEORY OF CAPITAL AS A PARTICULAR SORT OF PROPERTY CLAIMS

A caveat on what has just been suggested is that not all of those goods which potentially could be represented by financial instruments are so represented. Tentatively, it may be said that financial instruments are "property claims negotiable in financial markets." Trying to avoid the circularity of the argument, later we will discuss which features of some "property claims" allow them to be traded in financial markets while other forms of property are not. For now, keep the concept in mind and consider on one side the shares of a limited company which owns, say, a textile plant and all the inputs necessary for the production of fabrics; and on the other side, a public traded company owning a sister plant and all of the same inputs as the other one. In the former case, the shares of the limited liability company are property claims on the equipment, inventories and everything else that LLC owns, but those

claims are not tradable in the stock market. While, in the latter case, the shares of the public traded company, representing similar assets and liabilities, similar goods, rights and obligations, are traded in stock markets, part of the financial markets and, in this sense, those shares are financial instruments, they are easily "tradable property claims," while the shares of the LLC are not so much. It is not that you cannot negotiate LLC shares, you can, but not in an organized market intended to provide liquidity as a stock exchange. However, the difference is not only in the structure of the stock market in this example, if LLC's shares were allowed to be negotiated in stock markets without fulfilling the requirements of transparency, accountability and governance required from public traded companies, they would not achieve the degree of liquidity that the shares of most public traded companies enjoy. But if we accept that only some of the "physical capital" is represented by "financial instruments," out of necessity, we accept that not all physical capital is so represented. There are some components of the capital structure of society which, although they belong to someone and therefore are the object of some "property claims," those claims do not have the features required to be classified among "financial instruments." Perhaps, a better way to describe the relation between capital on the real and on the monetary/financial side of the economy is to understand it as part of a bigger picture in which all the objects of property rights on the "real" side of the economy have a counterpart in an "abstract" side of the economy. This abstract side is composed by all property claims and the instruments which embodied them, all the property right titles; and financial instruments, monetary instruments included, are just a special part of those titles, the ones that in a continuum of "salableness" are closer to the higher end.

IS THERE A RELATION BETWEEN CERTAIN GOODS AND CERTAIN FINANCIAL INSTRUMENTS?

An example better conveys the idea. Let's take the resources necessary to build a house. You need to buy the lot and have resources to hire the labor, rent the equipment and buy the materials to build

your home; and you can buy that home, the result from the employment of all those resources from a real estate developer for US$ 250,000. All those resources are owned by someone, likely as working and fixed capital (for the sake of this example, let's add human capital to the mix). So, a 30-year mortgage loan contract is signed with a bank, the bank gives the developer the 250k USD, the developer transfers the house to you, you become the debtor of the same amount to the bank, a lien is established on the property as a collateral to the bank, just in case the stream of revenue (your wages) you expect to use for the monthly payments is interrupted. The bank immediately sells your mortgage to an investment bank which bundles your loan with thousands of others, creating a bond representative of those thousands of mortgages (a mortgage backed security– MBS) and sells that bond to an insurance company which will own the bond until the last payment is received. But regardless of what happens in the future, the creation of this new instrument, which a parcel is representative of the 250k USD in long-term liquidity (generated by your mortgage), is more or less simultaneous to the transference of resources to the different owners of the inputs used in the construction of your new home. Alas, it is because they are credited fractions of that total 250k USD that they have transferred first to the developer the inputs that once put together became the house, and later the developer transferred to you the property of the house; whose lien (plus your own obligation to make monthly payments) is now part of the collateral of that new financial instrument, the MBS.

Now, let's assume that the added value of the wealth generated with the construction of your new home was about half of the price of the house; that is, the remuneration of the labor and effort put into your house by the developer and his suppliers. Before the construction of the house what existed was, say, a stock of construction material, a vacant lot and a number of equipment and workers with different skills, who, among other possibilities of employment, could be hired to build a house. Once that specific house was built and successfully sold, the compensation for the use of those pieces of equipment, the compensation for that work, including the work of the developer, was transferred to their owners possibly by cash or checks, while new wealth that became part of the assets used as

collateral for the MBS was created; i.e., your house. In this sense, there is a representation of the existing wealth and of the generation of wealth on the real economy in changes to the stock of financial instruments and their flows on the monetary/financial side, and the things going on in the real side are represented by the mutations and permutations on the abstract side of the economy.

ARE THERE FINANCIAL INSTRUMENTS WHICH REPRESENT NO GOODS?

Consider now a second example, let's suppose the government raises 500.000.000 USD selling 10-year-long Treasury bonds and uses half of that money to pay contractors doing maintenance work for the Bureau of Land Management (BLM) and the other half to pay the wages of the civil servants of the same department. The Treasury auctioned the bonds through its dealers and two buyers took half of the issuance each, a fixed income mutual fund and a pension fund. The pension fund plans to keep the bonds to maturity. The manager of the mutual fund simply adds the bonds to the assets of the fund with no idea how long those bonds will be held for.

Further, suppose that both buyers received the resources paid to the Treasury the previous day, one from future pensioners and the other from money market investors.

In regard to what the government did with the money, the investment in maintaining federal lands could be classified as a capital investment and to the extent that some income is generated in consequence of that, we may assess what the present value of such "investment" may be. For the sake of the argument, let's suppose zero income will be generated, therefore the present value of the investment is zero.

Concerning the payment of the wages of the department's employees, there is no doubt that no capital was acquired by the government to repay the money used to pay for those current expenses.

So, now we have on one side the government which have squandered the resources borrowed with the issuance of the bonds and on the other side the investors who are expecting to receive back

not only their principal (the capital they invested), but also interests on that. The investors have different time horizons for their investment, the mutual fund investors expect to take the money at any moment from the fund giving short notice (D+1) to the manager, and the pensioners expect to receive monthly payments for the next 10 years from the proceeds of those bonds and other portfolio investments of the pension fund.

Both investors think they have invested their savings in financial instruments which are representatives of real wealth, of real resources they are planning to consume in the future. Such representation may be vague, loose, only indirect, but still, the fact remains that the expectations of the investors holding those abstract financial instruments are that the property of those bonds would entitle them to acquire actual goods and services in a future time as short as tomorrow or along the next 10 years as it is the case of the pensioners.

However, different from the case which the investors would invest their money in a private bond that would fund fixed or working capital of some enterprise, the government has simply spent the money it got from the investors with the sale of the bonds.

Such realization invites then the following question: which proportion of all financial instruments represents actual capital goods?[8]

WHAT EXISTS BEHIND THE SMOKE AND MIRRORS OF NOWADAYS' PUBLIC FINANCE?

How will the government repay the money borrowed? Well, the government has the power to tax its subjects; so, ultimately, the capacity of the government to repay its debts relies on the capacity of the citizenry to pay taxes.

The problem is that the taxpayers more or less take into consideration in their calculations the taxes that they are expecting to be

[8] Unsatisfactory as the use of the verb "to represent" is for our purposes, the fact is that the economy is in trouble if the claims financial instruments "represent" cannot be all paid back. And we are not talking only about government's obligations, but also about other occasions in which capital is destroyed.

required to pay, not the taxes necessary to repay all government's liabilities in full.

Some estimates show that in the US economy all private material wealth (net worth) equals something like 90 trillion USD, with human capital added to that, the total private wealth is estimated to be something like 120 trillion USD, and the total of goods and services produced each year (GDP in 2015) around 18 trillion USD. Notionally, the assets owned by the government at all levels in the United States would be sufficient to cover their funded liabilities, that is, all the bonds they have issued (around 27 trillion USD); the problem is that there are unfunded liabilities, such as obligations with pensioners of publicly funded pension schemes and other unfunded entitlements such as Social Security, Medicare, Medicaid and the like which are not transparently reflected in the financial statements of government. Now, let's assume that all the assets of government in the United States, like the works done by the BLM in our example, cannot actually produce a positive net flow and therefore the present value of those assets is zero. Let's also assume that the acknowledged yet not accounted obligations at all levels of government in the US total other 27 trillion USD. So, if it is to pay all the obligations the government has at all levels, on top of the revenue necessary to pay for current expenses, the government would need to collect in taxes an additional amount close to three times the total of what is produced yearly in the country.

There are other ways to see this problem, we may think about the total assets and liabilities in the country, for instance. There is something like 300 trillion USD in assets and something like 180 trillion in total liabilities, both public and private. But a fact remains that the total of goods and services produced each year is only 18 trillion USD and all the payments to service the obligations owed by the individuals and government should derive from that amount; and if the average interests over the liabilities were 3% per year, that would represent 30% of the GDP. The service of the public obligations, about 30% of the total liabilities, would represent 9% of GDP or about 40% of all taxes collected by all spheres of government each year in the US.

There is yet another way to think about that. The 54 trillion USD in public obligations, with zero present value of assets to back

them, are understood by the creditors of the government as part of their wealth, as part of their property. So, the pensioners of public pension schemes, the beneficiaries of Social Security and other entitlements, and last, but not least, the investors in public bonds issued by all levels of government have expectations to consume in the future actual goods and services to be paid with the proceeds of those claims against the government. But the government has spent the money and created no wealth to be used to repay those claims. The fact is that the wealth saved by the claimants was destroyed by the government and no longer exists.

Such reality has not yet been reflected in the abstract side of the economy because the obligations of all the spheres of government in the United States still command credibility.[9] Because people still think that the claims against the federal, state, and local governments in the United States will be honored at face value, the reality that there is no actual wealth from which those obligations may be paid has not become clear to all the claimants.

Still, the only way for all those obligations to be paid would be to force a fire sale of assets to foreigners by a private sector forced to pay a much higher level of taxation (which would destroy the economy even if politically viable), or there would be a default in the payment of those obligations, either *de facto* or *de jure*; that is, either the payments would (i) be done nominally only with money with a lower purchasing power, or (ii) there would be a legal default, forcing the claimants to accept a "discount" in their credits, being that bond repayments, public funded pensions, social security or other benefits.

The bottom line is that the circumstances on the real side of the economy (more claims over goods than the existing goods or the possibility to produce more goods) *are* reflected in the financial side (bonds and other obligations which cannot be honored at face value, money which needs to be created "out of thin air" to pay obligations at a nominal value inferior to the current purchasing power of the currency, and so on).The fact that the price of financial instruments does not reflect currently the present value in real

[9] It seems that it is possible to have an extended lag between what is happening in the real side and how it is represented in the abstract side.

terms of those claims is an important challenge to the theory of financial instruments as representatives of claims on real goods and services. There are some possible explanations for that: - first, it is possible that the theory now proposed is mistaken, second, it is possible that the situation of public finances is not so dire as it seems at this moment; and third, there are opportunities for arbitrage since economic agents do not have perfect information. Tentatively, let us reject the hypothesis that the theory is mistaken and that we have gotten the facts about the state of public finances wrong, and let us will stick with the idea that there is imperfect information and changes for arbitrage[10].

THE EPISTEMOLOGICAL PROBLEM OF MONETARY PHENOMENA IS BIG; THE SAME PROBLEM CONCERNING CAPITAL IS BIGGER

We have already referred to the fact that stocks and flows on the monetary/financial side of the economy mirror in one way or another what is happening in the real side of the economy, but such representation is not exact, it is a mere approximation. Why is that? One reason for that is that we simply do not have the theoretical tools necessary to deal with such complex reality; even if the information exists (what is far from certain) we do not have the knowledge to find and interpret such information.

CAPITAL IS HETEROGENEOUS

Let's first assume that the information exists, we simply do not know how to gather it. Capital is heterogeneous in a way that mere

[10] An interesting object for research would be to try to understand which causes are preventing the economic agents from acting on the information about the dire state of public finances. Perhaps, one possibility worth testing is that all the owners of claims against the government think that the moment the state will be unable to honor its obligations, the coercive powers of the state will be used against other claimants and taxpayers in order to make their claims whole.

quantitative measurements do not reflect adequately the phenomena we are trying to understand. Further, capital is heterogeneous in many dimensions, it is at the same time a collection of goods on the real side and financial instruments on the monetary side; on the real side of the economy, it is composed by all possible goods and services that can be put to use to produce goods and services as well as goods which may be use as a store of value without any evident productive application, while on the financial side of the economy, it is composed of many different classes of financial instruments, with varied degrees of liquidity (cash, time deposits, bonds) and of certainty (stocks, bonds, future contracts). At this time, we must be skeptical about our possibility to understand how all the permutations of capital take place, and certainly, any attempt to treat it as homogeneous, as if it could be understood by quantitative changes of it as an aggregate number, seems to be insufficient to capture its significance.

THE MARKET IS NOT A PHENOMENON OPEN TO CARTESIAN ANALYSIS

Let's assume now that the information simply does not exist. In an open society in which the coordination of the economic activities of its members is done by the spontaneous order of the market created by the price system, the behavior of the economic agents is guided by the information they receive through the price system. The informational function of the price system means to say that people assess the demand for the goods and services they have to offer to be exchanged by the goods and services they want from others in an open society, and the relative price of those goods and services, by their prices in the market.

Changes in relative prices alone may induce alternative uses for certain goods and alternative applications of human capital, or saying differently, of the uses of one's time (Huerta de Soto, 2006, p. 271); but there are other changes, such as technological changes and institutional changes, directly affecting the allocation of resources in the economy (aside from their indirect effect through changes in relative prices). So, a car, which until yesterday was just

a consumption good, becomes a capital investment now that its owner has decided to work for Uber; contrariwise, an old building in the downtown area, which was previously used by a small clothing factory closed long ago, has now become the residence of its new owner. How is it possible to define what the stock of capital is if things have this fluidity?

The view of capital goods as part of the intermediary stages aiming to a certain final good implies considering capital only something already "applied" to a given production process. We should not say that this is a mistake, since each production process is composed of specific capital goods; but, arguably, goods with the *potential* to be part of intermediary stages of production may also be capital goods, if its owner's "opinion" is that such a good may be incorporated in a production process. If a bakery has a stock of flour from which it may bake cakes or bread, it is difficult to say that such stock is not part of its capital; if a construction company has a number of trucks that may indistinctly be used to carry construction material or tow other pieces of equipment, again, it is difficult to say that those trucks are not part of their capital. Things get more complicated when we think about a car in a dealership, which is part of the inventory of final goods for sale, in the mind of the dealer, may become a capital investment to an Uber driver, or the baker or the construction company, if that car is used in the business of the bakery or construction. So, in the sense that anything may become a capital good once an economic agent decides to use it as part of a process to produce other goods, other authors are right in calling attention not only to their heterogeneity but also to their specificity; to the extent that only goods "applied" to specific processes may be deemed capital goods, the concept should be expanded. One of the main characteristics of some forms of capital goods is this "stored" potential to produce many different things, and generally speaking, inventories of almost anything may have multiple uses, not only as instruments to produce many different final goods, but even as final goods themselves, and still be part of the capital stock of a given individual or society.

There is no dispute that people change their behavior in reaction to the relative price of the goods and services they have to

offer and of the goods and services they need both for their own consumption and as inputs for what they have to offer in the market. On the other hand, changes in the money supply may change the price level, aside from the changes in relative prices that, among other reasons, may occur as a consequence of the way changes in money supply are implemented.

Because economic agents perceive increased demand for the goods and services they produce caused by changes in the money supply exactly the same way they perceive changes in the demand for their products caused by changes in the demand patterns of the public; in the case of an increased demand, we may say that, while it would be possible for the production to be increased and profitably sold, the incentives operate on the producers for them to do so. Because in the real world individual agents do not operate along a curve of maximum production possibility in a static economy without changes in the technological level, but are always developing new ways to do things (and incorporating in the productive effort resources that were not available before for such purposes), it is possible to say that prices are not absolutely inelasticity in the economy; that is, faced with an increased demand for their products, producers will perceive that as an incentive to increase production and not to directly increase prices. Of course, the moment that the procurement for the inputs necessary to increase production will force an increase in the price of those inputs, the price of the products the economic agents are selling will go up in order for them to net any profit necessary to keep them producing. That is to say, prices are not perfectly elastic either, there are real constraints that cannot be ignored.

So, there is no direct and immediate relation between changes in demand and supply for goods and services in the market economy because prices are not always "inelastic;" that means that we cannot consider the permutations of the stocks and flows in the financial side as if they were simply a "bookkeeping record" of what is going on in the real side of the economy. Also, we cannot say that financial stocks and flows fulfill the same function as a "bookkeeping record" would. That is the case because the intermediation that money provides in allowing for indirect exchanges creates the conditions for those equivalences to be only approximate. Because money and

other financial instruments serve not only to clear spot transactions, but they are also instruments which serve as a store of value, and because the incentives generated in the market may induce producers to mobilize resources in unpredictable ways, we may say that the market phenomena are not open to a Cartesian analysis.

THE IMPLICATIONS OF THE PRICE ELASTICITY TO THE CHOICE OF THE MOST EFFICIENT MONEY AND BANKING ARRANGEMENTS

The implications of what has just been discussed are that some wiggle room exists and can be explored in the benefit of the economy in general and the money suppliers in particular, to the extent that they can manage their marginal costs of supplying additional amounts of money.

Another implication is that different money and banking arrangements have different levels of elasticity in the money supply, and to the extent that unused productive capacity in the economy exists, systems with more elastic money supplies can better harness the use of those resources.

However, there are limits to what can be achieved by elasticity in the money supply,[11], ideally, the supply of money should be entirely endogenous and provided under a competitive regime in order for the monetary system to benefit from the marginal costs of money production by limiting its supply to the necessary to fund profitable capital employments.

THE HYBRID NATURE OF THE MONETARY SYSTEM: ITS HISTORICAL ORIGINS, AND ITS IMPLICATIONS FOR CAPITAL THEORY

Since the establishment of the Bank of England (BoE) in 1694 and the beginning of the monetization of public debt, the monetary system

[11] See Zelmanovitz, 2016, chapter 11.

in modern economies has been a hybrid one. There is a portion of the money supply provided "exogenously" by the government and a part of the money supply provided "endogenously" by the banks.

We may understand how that happens with a schematic description of the operations of the BoE at its inception. At the beginning, the stockholders of the BoE received a chart from William III authorizing them to incorporate as a bank in exchange for giving a loan to the British Crown in perpetuity. That loan would be serviced by the revenue generated by a new tax and among the privileges given to the "Governor and Shareholders of the BoE" was that their notes would be accepted in payment for taxes owed to the crown, that they would be incorporated with limited liability and that they would be allowed to receive tax revenue on behalf of the crown. So, although the crown retained the monopoly to strike coins, that is, the prerogative to provide "external" money to the economy, the banknotes issued by the BoE soon started to circulate in parallel with the coins, and that was the beginning of "inside" money.

To be even more schematic, the stockholders of the BoE raised bullion equivalent to 1,2 million sterling pounds among themselves and loaned that amount to the crown, adding to the assets side of their balance sheet the bonds issued by the crown representative of that loan. Next, they created banknotes in the same amount of 1,2 million sterling pounds in their books and loaned them to private individuals who accepted them as money.

Both the crown was constrained in how much external money it could create (the government needed first to have the bullion to strike coins) and the bank was constrained in its ability to create inside money; since it was only its capacity to make profitable loans and to convey a perception of financial strength that would prevent the money holders from coming to the bank and cashing their notes for coins.

Although the cost of issuing the banknotes was low (just the paper, ink and other costs associated with printing them), the costs for a private bank to become aware and actually generate profitable loans were not; furthermore, the floating generated by the crown business aside from the regular operations with the private sectors started by the bank would limit the amount of cash they would have at hand and the ratio between the amount of coins in

their safes and the amount of banknotes in circulation they might safely have. In economic jargon, the amount of inside money that may be created by the private banks is limited by its marginal cost.

Still, at the beginning of our story, there was the equivalent of 1,2 million sterling pounds in bullion and that generated an equivalent amount in external money, to the extent that the crown coined all the bullion it received as a loan, and another 1,2 million sterling pounds in inside money represented by the banknotes issued by the BoE and lent to private individuals.

Starting with 1,2 million sterling pounds in equity, the BoE soon had a balance sheet with 2,4 million in assets, represented by the bonds issued by the crown and the private loans it generated; and 2,4 million in liabilities, half of that was the equity raised among the bank's share-holders, the other half were the banknotes redeemable in coins on demand, but they were kept in circulation in the hands of the money holders.

Everyone knew that the crown used most of the money it borrowed from the BoE to rebuild the navy after the defeats it suffered in naval battles with France. So, it was only the future revenue expected with the imposition of an import tariff, and of a tax on beer and other liqueurs (and the arrangements made to segregate such revenue in favor of the creditors of the government organized and incorporated as the BoE), which gave them the comfort to lend their money to the crown. And yet, not a penny was added to the capital stock of the country on the real side of the economy when those 1,2 million pounds were added to the stock of financial assets in the country (the shares of the BoE whose equity was 100% invested in the perpetual bonds issued by the crown having as collateral the revenue of the new taxes established by the "Tonnage Act of 1694").

The puzzle is, the government paid by the military built up with coins struck from the bullion it received from the BoE as a loan; although that added external money to the total stock of money in circulation in the country, that did not change the stock of capital in existence in the economy, since the bullion was already there before, at the beginning of our story.

However, the historical record shows that the government, the bank and the money holders were right in their assessment that the arrangements made to segregate the new tax revenue and the

capacity of the British economy to pay the new taxes were sufficient to service that loan (and many more that came later); had the crown succeeded in monetizing a greater amount of debt than its capacity to service the debt, the entire edifice of modern finances established at that moment would have crumbled. This may be understood as an example of an institutional change, the establishment of a legal and political new "technology" creating a "credible commitment" that the loan would be repaid (in spite of the awful track record of the British crown at that time as a debtor), which in effect made available an amount of liquid resources in the economy greater than what was available before. The capacity to segregate the tax revenues (generated by the new taxes established by the "Tonnage Act") in favor of the BoE was perceived by the market as if new wealth was created, since then, a private appropriation of that wealth (the present value of the stream of revenue of the 1,2 million sterling pound perpetual bonds paying 8% in annual interests) became possible.

In regard to the issuance of banknotes, the history is easier to understand, the BoE lent the banknotes to private individuals who offered sufficient evidence to the bank that they would employ the money in such a productive and profitable way as likely to be able to repay the loans with interest. In that way, the existence of the stock of banknotes in circulation matched approximately the wealth generated with those loans.

In our days, the production of external money is no longer limited by the gold standard (the government can create by fiat reserves with the central bank or print paper money – the two components of M0). Because of that, the private banks are also not limited in their capacity to create inside money, to the extent that they may get access to high powered money produced by the government. The private banks may create inside money by simply crediting the checking accounts of their borrowers if they can get access to reserves created by the government by fiat, instead of being forced to incur costs in a competitive market for funds in order to generate a portfolio of profitable loans.

Granted, private banks still need to make a profit on top of the cost of getting fiat money from the government, but if the government is willing to create external money and lend it to the banks at a lower cost than the cost for the banks to get liquidity in the market,

the potential for inflationary expansion of inside money by the banks is established.

So, there is always the possibility of inflationary expansion of the money supply, being that the supply of external money or the supply of internal money under the current hybrid arrangements of fractional reserve banking and fiat money as they have evolved from the arrangements initiated with the establishment of the BoE. The elasticity of the money supply under those arrangements, alas, the purpose for their introduction in the first place, is much higher than under a system of commodity money and limited creation of money substitutes.

In regard to the consequence of those arrangements for capital formation, it seems clear that the feature of endogenous creation of money has become an instrument to mobilize existing savings in an efficient way to foster production and in that regard, it has made society more productive. To the extent that the endogenous component of the money supply operates by the adoption of fractional reserves, that is, of the multiplication of claims over a limited quantity of exogenous money, it has made the entire system dependent on state coercion to survive external shocks. However, the bargain reached at the creation of the system with the establishment of the BoE has allowed the abuse of the mechanism by the state to exercise financial repression, determining the allocation of resources in the real economy for political purposes along the centuries. Such symbiotic relation between bank and state has produced, at the same time, the instruments for a more efficient mobilization of savings and an instrument for their use for political purposes, often causing a disconnect between the claims over real wealth that financial instruments represent and the existing stock of capital in the community.

A CLASSIFICATION OF BANKING ARRANGEMENTS AND THE IMPLICATIONS IT MAY HAVE FOR AN UNDERSTANDING OF CAPITAL THEORY

The first dimension along which we can classify different monetary arrangements is whether or not the base money of the community is a commodity money or fiat money.

A second dimension is whether the banks operate under 100% reserves or fractional reserves are admitted.

A third dimension is whether or not there is a central bank.

There are many other dimensions to consider, for example, whether there is legal tender or not, whether there is free banking or the banks are regulated, etcetera; but if we consider just the first three dimensions, we find a three dimensional matrix (a cube) with 8 possible different arrangements, as listed below on Figure 1.

FIGURE 1: CLASSIFICATION OF MONETARY ARRANGEMENTS ALONG THREE DIMENSIONS

	Nature of money	*Bank Reserves*	*Central Bank*	*Historical/ Theoretical examples*
1	Commodity	100%	Yes	Bank of Amsterdam
2	Commodity	100%	No	JHS proposal
3	Commodity	Fractional	Yes	English System 1694-1932
4	Commodity	Fractional	No	Scottish System 1695-1848
5	Fiat	Fractional	Yes	Current arrangements
6	Fiat	Fractional	No	Hayek's money denationalization proposal
7	Fiat	100%	Yes	Cochrane's proposal of narrow banking with monopoly of external money
8	Fiat	100%	No	Narrow Banking without money monopoly

It may be argued that it makes sense to consider the context in which we define what the proper monetary policy is to follow in order to achieve the purpose of having good money; nothing can be defined in an undefined context.

For instance, if you are in a regime with commodity money, the constraints on the creation of money are given by the cost of opportunity of the commodity used for monetary purposes. Also, it explains why certain banking arrangements are developed. If you have a money proper that is expensive, it makes sense to create a banking architecture designed to economize in base money such as fractional reserve banking.

Why was the BoE created with the features it was created? Because the bullion was expensive and creative ways to leverage whatever gold or silver they had for monetary uses made sense.

CONCLUSION ABOUT THE EPISTEMOLOGICAL LIMITATIONS OF THE AVAILABLE THEORETICAL APPARATUS

Well, all the discussion above about the BoE was just a digression to convey a fundamental idea divided in two parts; - first, that there is not a direct connection between what is going on in the real side of the economy and what is going on in the monetary side of the economy because changes in prices caused by inflationary creation of external money and of money substitutes may misguide the economic agents into thinking that the relative prices of some goods have changed, until they realize that what is happening is a change in the general price level; and second, that the government debt may distort the perceptions of the investors in thinking that new wealth was created when the government issued new public debt while the prospect of being repaid are still credible. The fundamental idea is that the information about what is going on in the real side of the economy simply does not exist with any meaningful precision; it is not that the information is not available, the case is that the information has not been created yet.

We do not know what would happen if the economic agents were free to interact with each other and how they would behave in reaction to changing circumstances. Such uncertainty, which plagues our understanding about the behavior of the economic agents in general, also dims our understanding of the mutations of capital in the economy.

One of the basic discussions in the “Cambridge controversies on Capital Theory” (as the discussions started with Joan Robinson in 1953 and some of her colleagues from Cambridge, England and the MIT, in Cambridge, MA became known) is that one of the reasons you cannot attribute a single present value to the stock of capital in the economy in order to use that in an equation to calculate the social aggregated production is because the interest rate theoretically should be determined by the marginal utility of capital.

However, such determination is calculated by the same social production function; therefore, it is a kind of circular reasoning. If you need to know the "value" of capital to apply the formula, but such value is contingent on the natural rate of interest, and you find such rate by applying the formula and comparing the return of capital with the remuneration of labor, it is difficult to evade the circularity of this proposition. That is just one more instance in which our knowledge about what capital is reveals itself deficient; aside from the others implicitly present or explicitly stated in these notes previously.

In any case, the intention with these studies in capital theory is first to develop a comprehensive and integrated overview of the field in order to understand the state of the art of capital theory; and, second, if it is found deficient, as at a first glance it seems to be the case, try to offer some contribution to the discussion such as this proposed "Representational" theory, that may be helpful to diminish our lack of understanding about capital theory.

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