

THE QUALITY OF MONEY

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ABSTRACT: Much has been written about the quantity of money and its effects on money's purchasing power. However, changes in the quality of money have been widely neglected. This paper analyzes changes in the quality of money and its influence on the purchasing power of money.

I. INTRODUCTION

The economics profession has recently neglected the connections between the purchasing power and the quality of money. In order to cover this gap, I will analyze the quality of money and how its changes affect the purchasing power of money. I will argue that changes in the quality of money can be far more important for the value of money than changes in its quantity. This conclusion is in line with the subjectivist approach of the Austrian School. In fact, the quantity of money is an objective and measurable aggregate. The quantity theory of money is the heart of neoclassical monetary theory, but does not reconcile well with the Austrian approach. In contrast, the quality of money is a subjective concept and should stand at the center of a monetary theory based on human action. Money serves people in attaining their subjective ends more efficiently and it fulfills certain functions for people. The better these functions of money are fulfilled in the eyes of actors the higher they value money. The quality of money is, consequently, defined

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as the capacity of money, as perceived by actors, to fulfill its main functions, namely to serve as a medium of exchange, as a store of wealth, and as an accounting unit. Hence, the theory of the quality of money maintains that the demand for money does depend on the quality of money. In fact, the quality of money is one of the important factors, along with uncertainty, financial innovations (credit cards, ATM machines, MMMFs), frequency of payment, etc. that affect the reservation or cash-balance demand for money. The theory of the quality of money, thus, contrasts with a one-sided quantity theory of explaining the price level.

I will first review the treatment of the quality and quantity of money by economists. I will then analyze different properties of money influencing money's quality and how they can change. In the process I focus on the function as a medium of exchange and as a store of value. I conclude with a summary of my findings.

II. THE THEORY OF THE QUALITY OF MONEY IN HISTORY

The theory of the quality of money, even though not under this label, has a long tradition. While many authors have discussed the factors influencing the quality of money, no unifying consensus has ever been established. Juan de Mariana (1609) explains that the deterioration of the quality of gold coins must be considered an (unjust) tax. Sir William Petty ([1662] 1889) considers the deterioration of the quality of coins by the government a tax. Adam Smith (1776) speaks of the origin of money and important qualities like durability and divisibility. Jean Baptiste Say ([1802] 1855) states that a good money must be divisible, of the same quality, resistant to friction, sufficiently rare, and malleable. He also analyzes the adulteration of the quality of money in historical instances as in the case of Philip I of France. Nassau William Senior ([1850] 1853) and John Stuart Mill ([1848] 1965) are two classical authors who discuss qualities of commodities that made them suitable to become money. Carl Menger (1871) explains the emergence of money as a spontaneous market process in which commodities with specific qualities prevail. Thus, the treatment of the qualities of money had been widespread before the twentieth century as William Stanley Jevons's (1875, p. 30) passage states:

Many recent writers, such as Huskisson, MacCulloch, James Mill, Garnier, Chevalier, and Walras, have satisfactorily described the qualities which should be possessed by the material of money. Earlier writers seem, however, to have understood the subject almost as well. Harris explained these qualities with remarkable clearness in his "Essay upon Money and Coins," published in

1757, a work which appeared before the “Wealth of Nations,” yet gave an exposition of the principles of money which can hardly be improved at the present day. Eighty years before, however, Rice Vaughan, in his excellent little “Treatise of Money,” had written a brief but satisfactory statement of the qualities requisite in money. We even find that William Stafford, the author of that remarkable dialogue of the Elizabethan age (1581), called “A Brief Conceipte of English Policy,” showed perfect insight into the subject. Of all writers, M. Chevalier, however, probably gives the most accurate and full account of the properties which money should possess, and I shall in many points to follow his views.

Austrian economists such as Mises (1953, chap. 1) and Rothbard (2004, pp. 189–93) have followed Carl Menger in their analysis of the origins of money. While Mises does not list the specific qualities that help a commodity to become money, Rothbard (2008, p. 6) mentions the “proper qualities of money”: commodity money is in heavy demand, highly divisible, portable, durable, and has a high value per unit weight.

However, Mises and Rothbard do not advance beyond this insight and do not mention—at least not explicitly—the importance of the quality of money for money’s demand. In fact, Mises neither in *The Theory of Money and Credit* (1953, pp. 131–37) nor in *Human Action* (1998) in his chapter on the demand for money (chap. 17) mentions the quality of money as a factor that influences money’s demand. As Salerno (2006, p. 39) states: “Mises (1998, pp. 398–402) provided only a very sketchy discussion of the demand for money which cannot bear the full weight of a theory of money prices.”

Rothbard (2004, p. 756) advances beyond Mises in his conceptualization of the demand for money and states: “The *total demand for money* on the market consists of two parts: the *exchange demand for money* (by sellers of all other goods that wish to purchase money) and the *reservation demand for money* (the demand for money to hold by those who already hold it).”

Rothbard (2008, p. 39) emphasizes that changes in the demand for money (as cash holdings) change money’s purchasing power. In chapters on the demand for money Rothbard (2008, chap. 5; 2004, chap. 11, sec. 5) like Mises does not mention the quality of money as a factor that influences the demand for money explicitly. However, Rothbard (2008, pp. 65–74) mentions two factors that are important for the quality of money: the confidence in money and inflationary and deflationary expectations.

In reviewing Mises’s and Rothbard’s contributions, one question comes to mind: Why did these authors not advance further and develop an explicit theory of the quality of money as a factor that influences

money's demand?¹ The answer lies most probably in their neglect of the function of money as a store of wealth. This function is essential for money's quality and is more sensitive to changes than the medium of exchange and accounting unit functions.

In fact, Mises (1953, p. 35) follows Menger (1871, p. 278), and maintains that the store of wealth function is a derived and not a necessary function of money. Indeed, Mises (1998, p. 401) focuses even more exclusively on the exchange function of money than does Menger:

Money is the thing which serves as the generally accepted and commonly used medium of exchange. This is its only function. All the other functions which people ascribe to money are merely particular aspects of its primary and sole function, that of a medium of exchange.

Mises (1953, pp. 107, 110, 129; 1990, chap. 4) and Rothbard (2004, pp. 764–65) focus on the exchange function. Thus, they neglect important factors for the value of money. As they do not analyze in detail the store of wealth function, they neither point to the effects that changes in it or that money's quality in general can have for money's demand.

In contrast to the hesitant qualitative monetary analysis by the economists mentioned above, there is also a current in the economic literature that does not treat qualitative issues at all. This is the simple quantity theory of money defended by David Ricardo.² For Ricardo it does not matter if gold coins, a chicken, a cocoa bean, a stone token or a paper note is money. Quantity is the only thing that matters. Quantitative issues explain all monetary phenomena. In fact, for Ricardo, all qualities of money are to be found within the limitation of money's quantity.

Ricardo and the followers of the simple quantity theory strongly emphasize the exchange function of money set forth by John Law and Adam Smith for whom money is basically a voucher to buy goods. Money is simply an instrument of circulation. These quantitative theorists thereby neglect completely the function of money as a store of wealth. Ricardo also implies that there is no difference between inconvertible

¹This question is intriguing considering that Mises (1953, part II, chap. 2) and Rothbard (2004, pp. 831–42) criticize the mechanistic quantity theory of money. In fact, Mises (1953, pp. 128–30) even criticizes the quantity theory for failing to go behind supply and demand to explain what ultimately determines the value of money. By analyzing the quality of money we will, thus, build on the monetary theory of Mises and Rothbard.

²For an analysis of Ricardo's monetary theory and his version of the quantity theory see, Rist (1966), esp. chap. 3.

paper money and convertible money certificates. He, consequently, neglects the demand for money. For him convertibility is just a practical method to ensure a limitation of the quantity of money.

For the believers of this quantity theory,

the value of money is a function of its quantity, it is entirely independent of the value of the material from which coins are made and derived solely from its peculiar uses. . . . (p. 49)

According to that theory, so long as the number of exchanges and the rapidity of the circulation of money remain the same, nothing can affect the value of the unit, and with it the level of prices, except changes in the volume of currency. (Scott 1897, p. 56)

As a consequence, quantity theorists tend to neglect the importance of the demand for money. As Carver (1934, p. 188) points out:

Most quantity theories of money are ostensibly demand and supply theories. Unfortunately, less attention has been given to the demand for than to the supply of money. In fact, some expounders of the quantity theory ignore altogether the demand for money, and proceed on the assumption that it is only the supply that counts. This ignoring of the subject of demand and concentration on the subject of supply seems to be based on the further assumption that the demand for money is, at a given time and under a given set of circumstances, fixed; that it consists exclusively in the number of commodities and services that are for sale.

The quantity theory of money continues to dominate in popular economics textbooks to this day. Some of the more widely used texts are: Mankiw (2004), Blanchard (2006), Stockman (1999), Hyman (1994), Slavin (1994), Boyed and Melvin (1994), Sachs and Larrain (1993), Ekelund and Tollison (2000), Case and Fair (1994), Dornbusch and Fischer (1990). Only a few textbook authors (Colander 1995 and Sloman 1994) mention qualities of money while Melotte and Moore (1995) claim that a good money must be divisible, portable, durable, and stable in value. The textbook by Abel, Bernanke, and Croushore (2008) does not even discuss the qualities of money at all.

Williamson (2005, p. 536) goes so far as to discuss several problems with the qualities of commodity money: First, its quality would be difficult to identify. Second, it would be costly to produce. Third, the use of the commodity as money diverts it from other uses.³

³See also Burda and Wyplosz (2005, p. 176).

Williamson (2005) may have given the real reason why only a few lines, if any, are put forward in support of the quality of money, for it was the advent of fiat paper money that lead economists to believe they found the perfect money. Thus, Lewis and Mizen (2000, p. 47) state that paper money can, in principle, do better than commodity money. They argue that paper money's value can be better stabilized and involves lower resource costs.

A second reason for the virtual disappearance of the quality of money from economic analysis is general equilibrium analysis and mathematization in economics. In general equilibrium analysis, there is no process. With equilibrium analysis the evolution and the origin of money, which would need an analysis of the quality of money, cannot be explained. In fact, the quantity theory of money can explain neither the rise nor the demonetization of money. Moreover, the mathematization in economics and the accompanying rise of the quantity theory of money allowed for measurement. As the quantity of money is more usable for mathematics and measurements, the quality of money was disregarded.

Insights into the theory of the quality of money existed prior to the twentieth century. These insights, however, only enumerate the characteristics of what a good medium of exchange must have, neglecting to point out the importance of the characteristics for the purchasing power of money. In other words, they do not investigate the effects of changes in these characteristics on the purchasing power of money and do not set forth a unified theory of the quality of money. Money has other functions than serving as a medium of exchange. Money serves also as a store of value and a unit of account. A complete theory of the quality of money, must therefore also investigate the qualities of a money in respect to these two other functions. The function of money as a unit of account will not be dealt with, instead the focus will be on the function of money as a medium of exchange and a store of wealth.

III. THE QUALITY OF MONEY AND ITS PURCHASING POWER

The price of money is its purchasing power. As any price, the price of money is determined by its supply and demand. The demand for money is determined by its marginal utility.⁴ The utility of money is, in turn,

⁴On a free market the supply of money, as the supply of any good, is indirectly determined by the subjective valuations of consumers. While neoclassical economists maintain that the supply of a good is determined by its historical costs of production, Austrian economists have maintained that the supply of a good is determined by alternative uses of the factors of production for the satisfaction of consumer wants and, thereby, by subjective factors.

determined by money's quality, i.e., its capacity to fulfill its services. The quantity of money affects money's marginal utility by increasing the number of monetary units. The quality of money affects money's marginal utility by changing the position of monetary units on the value scale of actors in relation to other goods. As Salerno (2006, p. 52) summarizes the determinants of the purchasing power of money:

the stock of money is one of the immediate determinants of the structure of money prices and the purchasing power of money—in conjunction with its immediately past purchasing power, the existing stocks of goods, and the distribution of ownership and *the relative rankings of goods and of money among market participants*. (Italics, added)

It is this relative ranking of goods and of money among market participants that is affected by the quality of money. The factors influencing the quality of money and, consequently, the relative ranking of goods and of money have been widely neglected. Their analysis is precisely the focus of this paper.

Thus, while the quantity of money is important for the purchasing power of money, it is not the only factor. As Henry Hazlitt (1978, p. 74) puts it:

The truth in the quantity theory is that changes in the quantity of money are a very important factor in determining the exchange value of a given unit of money. This is merely to say that what is true of other goods is true of money also. The market value of money, like the market value of goods in general, is determined by supply and demand. But it is determined at all times by *subjective* valuations, not by purely objective, quantitative, or mechanical relationships. (Italics in original)

Indeed, the quality of money is an essential factor in the process determining money's price, i.e., its purchasing power. When the quality of money increases, money's demand and, consequently, purchasing power will be higher than without this quality improvement. Money is, thus, no different than any other good. If the quality of a good increases, there will be more demand, and its price will be higher than without this increase of quality.

The importance of the quality of money can be seen in Eugen von Böhm-Bawerk's analysis of price determination. Böhm-Bawerk (1884) names six individual determinants of prices in his price theory: the number of units of the goods offered; the number of units of the good demanded; the intensity with which the potential seller values the good; the intensity with which the potential seller values the monetary unit

(or good of exchange); the intensity with which the potential buyers value the good; and the intensity with which the potential buyers value the monetary unit (or good of exchange).

The last four determinants can be summarized as the intensity of the valuation of money in relation to the valuation of other goods and services on the part of potential buyers and sellers. This intensity is not only influenced by the quantity of money and goods and services but also by the quality of money. The higher the quality of money is, the more buyers and sellers of money value the monetary unit in relation to other goods and services. The lower the quality of money is, the less buyers and sellers of money value the monetary unit in relation to other goods and services. This implies, that the purchasing power of money can vary with a constant supply of money and of goods and services if the quality of money changes. When people start to value money higher, the purchasing power of money will be higher.

Actually, changes in the quality of money can have more abrupt and stronger effects on the price of money than changes in the quantity of money. In fact, changes in the quantity of money only have marginal effects on the value of money. Changes in the quality of money however can abruptly upset the subjective valuation of money in general. Apart from dramatic changes in the money supply, faster movements of the price of money can be expected by changes in the subjective valuation of money's quality than by changes in its quantity.

One important ramification of the quality theory of money is that prices in general can rise or fall without a change in the quantity of money. Frank Shostak (2008) does not take into account the quality theory of money when he writes:

We know that a price of a good is the amount of money paid for the good. From this we can infer that for any given amount of goods, a general increase in prices can only take place in response to the increase or inflation of the money supply. . . . Now, if the money stock did not increase, then consumers won't have more money to support the general increase in prices of goods and services.

Shostak is wrong precisely because the quality of money can fall without an increase in the money supply.⁵ The subjective valuation of money and, correspondingly, its marginal utility can fall as a result of a deterioration of money's quality. As a consequence of the lower subjective valuation

⁵Subjective value theory shows that the price of pens can fall when the quality of pens decreases even with a constant supply of pens. The same is true for the price of money.

of money, money's price falls. If my subjective valuation of money falls, I will try to reduce my cash balance. If I sold five apples for five dollars, now that the value of money is less I might sell one for five dollars. The same applies for the prices of other goods. As a result, I reduce my real cash balances.⁶ Dollar prices have risen because of a change in subjective valuations and not a change in the quantity of money. This rise in prices is due to a fall in the quality of money that resulted in a fall in the demand for money. The fall in the demand for money means that money's position on value scales relative to other goods' positions has deteriorated.

In the following section we will discuss factors that influence the quality of money and, consequently, money's subjective valuations. Some of the factors are related to expected increases in money's quantity; a possibility not considered by Shostak. Other factors are completely disconnected from quantitative considerations.⁷

IV. QUALITY OF MONEY AND ITS FUNCTION AS A MEDIUM OF EXCHANGE

We will first look at factors or properties that influence the quality of money in its function as a medium of exchange. When these properties change the quality of money improves or deteriorates and affects the purchasing power of money.

There are several properties of a good medium of exchange. Most of them have been discussed in the literature in another context, namely, in explaining the origin of money. In fact, the quality theory of money can explain the emergence and disappearance of money while the quantity

⁶The opposite case is, of course, also possible. When people try to increase their real cash balances due to an increase in the quality of money, prices will be lower than otherwise. The effect holds independent of the quantity of money. The phenomenon of falling prices due to a generalized wish to increase cash balances has been called "cash building deflation" (Salerno 2003). See also Hülsmann (2003).

⁷At this point, consider some examples provided by Carver (1934, p. 194):

The desire for [money] is, in turn, made up of several elements. First, there is the fact that the Government will accept it in payments to itself; secondly, there is the fact that creditors must accept it; thirdly, there is the fact, sometimes, that the Government will give gold for it; fourthly—a resultant of the first three—there is the fact that custom has made it acceptable in private purchases. Remove any of these elements and the purchasing power of money will decrease without any increase in the quantity of money or any decrease in the number of commodities and services available for exchange.

theory cannot explain these phenomena.⁸ One of the most important properties for the quality of money is the existence of a non-monetary demand in society for the money. This demand can be in the form of consumption goods or factors of production. It is important for the quality of money that its non-monetary demand plays an essential role in society—everyone wants and needs it. The money is not only demanded as a medium of exchange but also for other purposes. Thus, for money, as a good, there exist many unsatisfied wants and the intensity of the wants are relatively high and permanent (Menger 1892, p. 5). The non-monetary demand is important because it gives the money holder an “insurance.” Even if the money gets demonetized, i.e., it loses its monetary demand, there is still considerable value to it. The non-monetary demand supports its value.⁹ In sum, the higher the non-monetary demand, the higher the quality of money. If,

⁸Another deficiency of the quantity theory of money is that it resorts to the so-called “velocity of circulation;” a black box used *ad hoc* to explain price changes unexplainable via quantity changes. Yet, an increasing “velocity of circulation” or increasing volume of exchanges in a period does not imply that prices necessarily need to rise. In fact, an increase volume of exchanges on the stock market may coincide with rising or falling stock prices. I thank José Ignacio del Castillo for bringing this point to my attention. Moreover, as a consequence of changes in the store of wealth and medium of exchange function the demand for money may change for a multitude of reasons. To explain all these phenomena by referring to the “velocity of circulation” does not clarify anything. Thus, Mises (1990, chap. 5) calls the “velocity of circulation” a “nebulous metaphor” and Rothbard (2008, p. 29) an ill-defined concept. In any case, a higher “velocity” may be the result of a deterioration in money’s quality (or of a decline in uncertainty, or of financial innovations such as credit cards, ATM machines, etc.), but not its cause. As Salerno (2006, p. 51) puts it: “the aggregate flow of money spending is determined by the value of money and not the other way around.” Salerno rightly criticizes the “vacuousness of the quantity theory.” Similarly, Carver (1934, p. 191) states that when “paper money is no longer redeemable it becomes less desirable, and therefore is spent more promptly. It loses some of its desirability—as a store of value.” In other words, a lower quality as a store of wealth may lead to increased spending independent of quantitative issues. As Carver adds, the increased spending can, however, be compensated for by a decreased eagerness to sell, because sellers also value money less than before. Then, it is not clear at all if the velocity of circulation will increase or decrease. It is, therefore, not an increase in the “velocity of circulation” but the decrease in desirability that explains the fall in purchasing power.

⁹When gold, in 1971, became demonetized, there remained a strong industrial demand, and also as a store of wealth. The price of gold in terms of dollars even soared as the quality of dollars was reduced. The quality of dollars was reduced by suspending the redemption in gold. The price of gold in dollars rose from the conversion rate of \$35 in 1971 to a yearly average of \$58 in 1972, to \$97 in 1973, to \$159 in 1974, and to \$613 in 1980. The increase in the quantity of dollars was also important when the price control on gold was removed.

for instance, gold is money and demand for gold jewelry increases, more gold will be used for these purposes and the marginal utility of gold is raised. In other words, the marginal utility of gold may change independent of the rapidity of circulation, the number of exchanges, and the quantity of gold (Scott 1897, p. 56).¹⁰

Furthermore, the more people that accept the money the better the money functions as a medium of exchange. In fact, the incorporation of new users improves the quality of the money. For instance, when people that are engaged in barter start using money its quality is increased. When the Soviet Union and China opened their economies and became a market for dollars, the quality of the dollar increased. The introduction of the euro, in ever more countries, can improve its function as a medium of exchange as more potential buyers accept it. Also legal tender laws influence the acceptance of money and, thereby its quality. As Carver (1934, p. 188) points out, it does matter for money's purchasing power if paper money is legal-tender and accepted by the government for the payment of taxes and duties or not. By giving paper money legal privileges, the government subsidizes its quality by increasing its use in exchanges.

Other properties for money as a medium of exchange are low storage and transportation costs, easy handling, durability, divisibility, resistance to tarnish, homogeneity and recognizability.¹¹ Changes in these properties affect the quality of money and thereby its purchasing power independent from money's quantity or expectation about money's quantity.

V. QUALITY OF MONEY AND ITS FUNCTION AS A STORE OF WEALTH

One of the most important properties of good money is that it is a good store of wealth (Menger 1871, p. 277). Money is the most marketable or liquid good. Liquidity is higher or lower as the loss of value (or the loss of time) experienced in liquidating ever larger quantities of an asset is

¹⁰Carver (1897) also emphasized that the value of money is determined by the same general laws of value as any other good and, specifically, by its metallic value independent of the number of money units. Similarly, Conant (1904) mentions the importance of the intensity of the demand for money. He shows that an increased demand for gold for use in the arts reduces its supply for monetary use.

¹¹Actually gold became useful as a world money only after advances in metallurgy made divisibility easier. See Fekete (1996, pp. 12–13). These advancements led to an increase in the quality of gold coins and in a higher purchasing power. Indeed innovations such as new melting techniques improved the quality of money (coins). Likewise innovations that decrease transportation costs, facilitate handling, resistance, recognizability or increase homogeneity, and durability also improve the quality of money.

smaller or greater. The spread between bid and ask prices for a good is an increasing function of quantity. Rising spreads go along with increasing quantities offered.¹² Different goods have different spreads. The speed with which spreads increase is determined by the speed with which marginal utility declines with increasing quantities.

As money is the most liquid good, people can easily store their wealth and profits from sales until needed for exchange. The stored money serves as purchasing power for the future. People can easily separate the moment of the sale of their product from the moment of the purchase of their needs. Money is, thus, a means to store wealth and preserve the value of goods and services (mainly labor) sold from price fluctuations. It is insurance against the uncertainties of the future. The store of wealth function is, consequently, crucial for the origin of money and for money's quality. A medium of exchange that loses its storage function will also lose its exchange function.

For the purpose of our paper it is not important if the medium of exchange function or the store of wealth function is more important for the origin of money or if they are two sides of the same coin.¹³ The store of wealth function is key for the quality of money.¹⁴ In fact, exchange

¹²This does not contradict the fact, that spreads are high in some markets and lower in others. It is true that in "thin" markets spreads are high. However, when the quantities offered in "thin" markets increase, spreads also increase. When we buy and sell a book in Sanskrit we will have a high spread. When we buy and sell 1,000 books in Sanskrit, the spread tends to increase. In other markets like the stock market spreads are comparatively low. However, the stock market spreads increase with quantities offered. When we buy 1,000 shares of IBM and sell them the next second, the spread is usually very low. When we buy 100,000,000 shares of IBM and sell them the next second, the spread tends to increase.

¹³It is true, that other goods besides money, such as commodities, serve as a store of wealth. If commodities become relatively more desirable as a store of wealth than money, money's purchasing power decreases. The same is true for the exchange function of money. Other goods besides money, such as stocks (used as a means of payment in a buyout) or bills of exchange are used in exchanges and their desirability relative to money influences money's purchasing power. In fact, anything may serve as a medium of exchange while not any object can serve as a store of wealth.

¹⁴Rist (1966, p. 329) is an example of an author that argues that the store of wealth function is more fundamental and prior to the medium of exchange function:

In fact, and this point is fundamental, the function of acting as a medium of exchange, *since time is necessarily involved (there is always a certain interval between the receipt of money and expenditure)presupposes* the function of a store of value . . . [the storage and the exchange function of money are] as inseparable as the obverse and reverse of a medal. (Italics in the original)

always takes place in time. Production and consumption are not simultaneous.¹⁵ Abstracting from time in economics has led to crucial errors in price theory, capital theory, etc., and it is equally misleading to abstract from time in monetary theory or exchange theory. When people sell their products they cannot, or do not, buy goods and services they need at the very same moment, but rather at a later time. A liquid good to store the wealth that does not lose in value is, hence, crucial.

There are several characteristics of a good store of wealth. One important characteristic is the hoardability or storability of a good (Fekete 2003, p. 2). A good is more storable the smaller the loss incurred when it is bought and sold in the smallest quantities—when it is possible to add and subtract small amounts from one's store of wealth with minimal costs. It should be noted that hoardability is slightly different from liquidity. The more liquid a good is, the slower the increases of the spread between bid and ask prices with increasing quantities. Hoardability, however, refers not to the costs of selling and buying large quantities of a good but rather to the costs of selling and buying small quantities of a good. Thus, salt may be more hoardable than gold but less liquid. Hoardability is also different from divisibility. Divisibility is the ability to divide a good to make exact purchases, while hoardability refers to the economic costs of adding or subtracting from a store of wealth. Teleologically, these concepts refer to different ends, namely exchanging and storing.

Another important characteristic in relation to money's function as a store of wealth is the possibility of changes in the quantity of money. Thus, the quality of money as a store of wealth is influenced by the possibilities of changing money's quantity. It should be noted from the outset that the possibility of changing money's quantity (and derived

¹⁵Rist (1966, pp. 107–08) emphasizes the time element. He explains the characteristics a good store of wealth must fulfill and how gold does so:

it must be borne in mind that man lives in *society*, that social life implies *exchanges* of services and products, that the greater part of these exchanges can only be effects *after an interval of time*, and that the goods which offer the best possibility of guarding against the uncertainties of time, of taking precautions against its risks, of preserving, in order to provide against future misfortunes, the equivalent of the labour and the services provided, are precious, rare, durable and indestructible objects, such as gold. . . . Stable money, metallic money, is the *bridge between the present and the future*. It is because of stable money, or, in its absence, of other stable and precious objects, that, within the economic sphere, man can wait, can reserve his choice and calculate his chances. Without that, he would be completely at a loss. (Italics in the original)

from this possibility is money's expected quantity) is only one of several factors that influence the quality of money. Moreover, the expected quantity is relevant for human action precisely because it affects the quality of money. It is relevant because it influences money's capacity to function as a store of wealth. The expected quantity of money is one of the important factors determining the quality of money.

Let us first look at how the quantity of money increases in free competition. Two characteristics of money production in the free market influence the quality of money as a store of wealth. First, the costs to produce the money are important. Money production costs are determined by the value that individuals place on additional money. The higher the production costs of the money in relation to its market value, the slower the quantity of money will increase. Second, the already existing stock of money in relation to potential production is important. The higher the existing stock in relation to potential production, the lower is the potential rate of increase in the money supply and the better the storage function of money is fulfilled.

We now look at the case of a monopolist money producer. When there is a monopolist producer of money an important property of the money is how its quantity is expected to change. In a fiat paper money standard with a central bank, for instance, the institutional setting of the central bank becomes relevant.¹⁶ The institutional setting of the currency, therefore, also determines money's quality. For instance, a central bank that receives its orders directly from the government is more likely to be used to monetize government debt in order to finance spending. A formally "independent" central bank, consequently, improves the quality of the currency.¹⁷ The statutes of the central bank, until they are changed, can to a certain extent limit the potential increase in the money supply. Incentives (like bonus payments for central bankers) to inflate the money supply less can also increase the quality of money. If central bankers are accountable and responsible for their policies, and if there is transparency, this can improve the quality of money.

The official goals or mandates of the central bank, as well as the minimum reserves they impose on banks, plays a role in the way the

¹⁶The set up and the "formal" independence of the central bank can be changed, of course, and this can also be anticipated.

¹⁷In an empirical study, Spiegel (1998) argued that announcement of the independence of the Bank of England on May, 6 1997 led, on this very day, to a reduction of long-term interest rates by an average of 34 basis points, and thus a reduction of inflationary expectations. This reduction of inflationary expectations represented an increase in the quality of money.

quantity of money is expected to be increased and influence money's quality. In other words, the philosophy of its monetary policy implied in the statutes of the central bank, or the philosophy of central bankers, influences the quality of money in the way that the quantity is expected to change.

A central bank, whose official policy is to stabilize consumer goods' prices, stands for a higher quality of money than a central bank that in addition to the control of consumer goods' prices tries to stimulate the economy, stabilize asset prices, or seek full employment.

The ideology of the central bank's president and other central bank staff, influences the quality of money. In addition, comments by central bankers and politicians can immediately alter the quality of money. For instance, when the chairman of the Federal Reserve board states that he is willing to do anything to prevent a recession, this will be interpreted as the promise of future monetary inflation. As a result, the quality of money decreases and there will be an immediate impact on prices, as the currency depreciates in terms of foreign currencies. The dollar price of all goods and services outside of the U.S. increases. Moreover, the prices of commodities can be influenced by central bankers' comments without a necessary change in money's quantity. The announcement, as well as its anticipation, of a Paul Volcker or a Ben Bernanke as Federal Reserve president influences immediately the quality of money.

The integrity of the monetary unit is another important property of the quality of money. Money's integrity, for instance, may be altered through wear and tear of metallic coins. While the nominal quantity of money remains the same, wear and tear leads to higher prices than otherwise. Coin clipping is another example. The government denigrates the quality of the monetary unit by cutting part of the coin away and replacing it with metal of an inferior value (such as copper), without changing the quantity of coins in circulation. For instance, the government can clip 10 percent of the gold coins in circulation and hoard the clipped gold or do whatever it wants with it. The quality of money may decrease independently of whether the government spends the hoarded gold or not. When people become aware of this practice it will lead to higher prices, since instead of coins of 100 percent gold, the coins are 90 percent gold and 10 percent copper.¹⁸ It is then likely that people value gold and copper, as well as other goods and services higher in relation to the currency unit than before. In this case prices do not rise because the

¹⁸To make the point even clearer imagine that the government does not just hoard the golden ball but transports it in a ship over the ocean. The ship sinks in a storm and the gold is irretrievably lost.

quantity of money increases or is expected to increase but rather because the quality of the money unit's gold content was diminished.

Another case of altering the integrity of money is a change in the redemption rate of a government-controlled commodity standard. When the U.S. government changed the redemption rate for the dollar from 1/20.67 to 1/35 ounce of gold in 1933, the quantity of the outstanding dollars was not changed. However, the quality of the dollars changed as there was less gold backing (Carver 1934).

This leads us to the question of the backing of money in the broader sense, i.e., money proper and money-substitutes. Goods or rights of different qualities can be used to back money in the broader sense. The crucial question is, can a money-substitute be redeemed against goods or rights of higher quality? Do bank notes represent a right of redemption in specie? Are the notes just fiat paper money notes? Is the note a money-certificate that can be redeemed against assets of the banks or central banks or not?

A bank note that is a money certificate is of a higher quality than inconvertible paper money.¹⁹ This is so, because inconvertible paper money presents a claim on an indeterminate amount, while a (convertible) money certificate is a claim on a clearly defined sum. Inconvertible paper money presents a claim on something that is not specified, it fluctuates in value according to the holder's estimation of what the inconvertible paper money will be able to buy. If this estimation is very low, the value may well fall to zero.²⁰ Inconvertible paper money's capacity to serve as a store of wealth is dominated by this uncertainty. Nothing of this sort happens with a (convertible) money certificate that, for instance, can be exchanged at any moment against gold. As Rist (1966, p. 200) summarizes: "In short, convertibility is not a mere device for limiting quantity; convertibility gives notes *legal and economic qualities* which paper money does not possess, and which are *independent of quantity*."

Hence, when the redemption of bank notes in a gold standard is suspended, the quality of money, from one second to the next, is reduced (independent from what might happen to money's quantity). Bank notes are traded at a discount in relation to gold. This discount grows when people fear redemption is less probable, while the discount shrinks when people regard redemption as imminent. Mises (1953, p. 52) points

¹⁹As Carver (1934, p. 188) points out, quantity theorists erroneously must maintain that money would have the same purchasing power going off gold, provided the quantity of the paper money remains the same.

²⁰This estimation is influenced by expected quantitative and qualitative monetary developments.

out, that the value of credit money fluctuates independently of the underlying commodity, depending on the expected probability that it will be redeemed in the future, and on the remoteness of the expected future date of redemption. An illustration is provided by the history of the greenbacks in the U.S.²¹ After the beginning of the American Civil War, redemption was suspended with the promise to resume redemption at some future point. As a consequence, prices rose in terms of greenbacks reflecting the deterioration in quality. During the Civil War, the purchasing power of greenbacks fluctuated with the military success of the Union, independent of quantity issues (Carver 1934, p. 203). With the resumption of specie payment in 1879, there was an expectation that the quality of the money would increase resulting in an increase in purchasing power (Bagus 2008).

Another historical illustration of the importance of the backing of a currency is the “Bully Marks” in a German prisoners’ of war camp during World War II, as described in Radford (1945). The “Bully Marks” were backed 100 percent by food at the shop and the restaurant in the camp. When the camp was bombed, the restaurant was closed for a short while and food parcels were halved. As a consequence, it became apparent that the backing of the “Bully Marks” became insecure. “Bully Marks” lost ever more in value in relation to the more secure cigarette currency. At the end there was a flight from the “Bully Mark”—a fact, that was not caused by changes in its quantity but rather its quality.

When redemption is suspended indefinitely and there exists no hope that it will be resumed, as occurs in a fiat paper money, the assets and reserves that central banks and banks hold are still important for the quality of money. This is so, because those assets and reserves back the liabilities of the banks.

When a bank goes bankrupt, because of a bank run, the bank’s assets are taken over by the depositors and creditors. The more liquid and valuable the assets the less the money holders can lose and the better is the quality of money. For instance, consider two paper money fractional reserve banks who hold 10 percent reserves in cash and both experience a bank run leading to bankruptcy. Bank A holds foreign reserves, gold and commercial bills as assets, allowing for a rapid sell off and a recuperation of large amounts of the depositors’ money. Bank B holds low quality mortgages and other illiquid long-term loans that can only be sold at huge losses or cannot be sold at all. Of course, people would tend to pre-

²¹A similar case are the French *assignats* that fluctuated in value according to the opinions of the chances of redemption. See Rist (1966, p. 189).

fer notes from Bank A to those from Bank B. Thus, changes in the assets banks hold affect the quality of their notes.

Similarly, the assets of the banking system as a whole influence the quality of money. Just imagine that Bank A or Bank B represents the aggregate balance sheet of the banking system. The assets of the central bank are especially important for the quality of money (Bagus and Schiml 2008). The assets of a central bank can be used to defend the value of a currency internally and externally. Furthermore, these assets can be used to support a collapsing banking system or a monetary reform. They back the liabilities of the central bank which is mainly the monetary base. A deterioration of the average quality of central bank assets might be called “qualitative easing.” A qualitative easing is possible without an increase in the quantity of money. For instance, a central bank may sell its gold reserves and in turn acquire loans granted to an insolvent bank or troubled government. This deterioration of the average quality of central banks assets while not affecting the quantity of money deteriorates its quality.²²

A final characteristic of the quality of money as a store of wealth is the policies, the ideology, the personnel, credit, and status of government.²³ When the fiscal condition of government improves (deteriorates), the danger that government will resort to a deterioration of the monetary standard is lower (higher) than it otherwise would have been. A deterioration of the money standard (improvement) can consist in abandoning (returning to) a commodity standard, a change in the redemption rate or in the increased (reduced) use of the printing press to finance its expenditures.

In fact, a budget deficit is like a “currency illness” and reduces the quality of money (Röpke 1954, p. 142). The amount of public debts is like a “currency cancer” and weighs on the quality of money. The condition of government actually can get very alarming and a fear arises that

²²An example is the subprime crisis. While the quantity of money did not change very much from January 2007 to August 2008, the average quality of assets that the Federal Reserve System holds deteriorated substantially. Government bonds were substituted by assets of dubious quality. This process might explain part of the price inflation during the period. See Bagus and Schiml (2009). See Bagus and Howden (2009a) for an analysis of the quality of money as influenced by the actions of the European Central Bank during the financial crisis and Bagus and Howden (2009b) for a comparison of the balance sheet policies of the Federal Reserve System and the European Central Bank and the implications for the quality of the respective currencies.

²³See on this point also Hazlitt (1978, p. 76).

the government will cease to exist, e.g., the government could be overturned in a revolution or suffer defeat in a war.

In a fiat paper standard the bankruptcy or the end of the government likely means the end of the currency and renders it worthless. It is the confidence in the economy and the taxation capacities of the government that hold the value of the fiat money up. The taxation capacity is crucial, because a fiat paper money is backed by the reserves of the banking system and central bank, which are largely government debts. When government debts become worthless because of an end of government due to war or revolution, the fiat money will also lose in value and may cease to exist. An example would be greenbacks during the American Civil War. The depreciation of greenbacks in terms of gold increased after Northern defeats and was reduced by Northern victories (Studencki and Kroos, 1963, p. 147).

Another example is the development of the currency of the Philippines issued by the Japanese in World War II, as mentioned by Henry Hazlitt (1978, p. 76):

One of the most striking illustrations of the importance of the *quality* of the currency occurred in the Philippines late in World War II. The forces under General Douglas MacArthur had effected a landing at Leyte in the last week of October 1944. From then on, they achieved an almost uninterrupted series of successes. Wild spending broke out in the capital of Manila. In November and December 1944, prices in Manila rose to dizzy heights. Why? There was no increase in the money stock. But the inhabitants knew that as soon as the American forces were completely successful their Japanese-issued pesos would be worthless. So they hastened to get rid of them for whatever real goods they could get.

Not only wars influence the quality of money. Also economic development influences the quality of money. Anything that disturbs or disrupts development inhibits the taxation capacities of the government and, therefore, potentially the quality of a money. The importance of government policies for the quality of money implies that the government can improve the quality of money if it credibly can impose restrictions on its fiscal policies. Thus, the introduction of a new article in the constitution of a country, that makes a balanced budget mandatory, can increase the quality of money. A related example is the "Stability and Growth Pact" of the European Union. The "Stability and Growth Pact" mandates an annual budget deficit no higher than 3 percent of GDP and a national debt lower than 60 percent of GDP or approaching that value. This was instigated to raise confidence in the Euro currency and give a

guarantee of its quality. On the other hand, signing a treaty that will probably lead to reckless governmental policies and monetizing of debts, will decrease the quality of money. An example is the signing of the Treaty of Versailles after World War I (Bresciani-Turroni 1968, p. 54). Confidence in the future of Germany declined and a flight from the Deutsche Mark set in. Likewise, Charles Rist (1966, p. 152) emphasizes the importance of government finance for a currency:

when the convertibility of paper has to be re-established and the exchanges stabilised, sound finance and a balanced budget count far more than limitation of the quantity of paper. The important thing in such a case is to reassure foreign holders of securities or currency as to the ultimate value of paper, and this can only be done by convincing them that the financial stability of the State has been re-established.

From all this we can infer that a fiscally irresponsible government reduces the quality of money. This is so, because by excessive taxation it destroys the productive capacities of the country, reducing the quality of existing government debts. It also increases the amount of government debts itself, which implies even higher future taxation or the monetization of debts. This implies a reduction of the quality of money. Hence, a change in the government itself, its personnel, philosophy, promises, etc., can change the quality of money without any change in money's quantity.

VI. CONCLUSION

The economic profession has largely neglected the quality theory of money concentrating mainly on money's quantity. Changes in the quality of money are very important for the purchasing power of money and have an important explanatory power. The quality of money affects the purchasing power of money by first altering the demand for money, which reflects the changed valuation of a fixed quantity of money on the public's value scales. The expected quantity of money is only one of many factors influencing the quality of money and derives its importance from its effects on the quality of money. Thus, an integrated theory of money must put emphasis on the quality of money and explain the importance of the expected quantity of money relating it to its effects upon money's quality.

Money's quality is continuously changing. The changes in the quality of money can be slow but also abrupt. Consequently, they can have stronger effects for the purchasing power of money than changes in money's quantity, which are seldom abrupt. Actually, increases in the

quantity of money are increasingly less important the higher the quality of the money is. This is so, because with a money of high quality there will be a strong demand to absorb the additional amount of money as a store of value or for industrial or consumption purposes. If its quality deteriorates or is expected to deteriorate, it can have strong effects on the purchasing power of money. Furthermore, increases in the quantity of a money of high quality such as a 100 percent gold standard do not result in a deterioration of the integrity of the money. The integrity of the previously existing gold coins is not harmed by new gold production. In contrast, increases in the quantity of a money of lower quality, i.e., a fractional reserve paper money, can cause money's quality to deteriorate by diminishing the average backing of the previously existing monetary units.

In sum, it is time for economists to shift their focus onto the analysis of the quality of money and how it can be changed in line with the analysis in this article. For instance, the quality of different monetary and political regimes, the relevant properties of a good money, the role of expectations and the quality of media of exchange should be analyzed in more detail.

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