

A SUBJECTIVIST APPROACH TO THE DEMAND FOR MONEY

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1. Introduction

The renewal of interest in subjectivist economics since the mid 1970s has brought with it the opportunity to apply some of its insights to various fields in economics. One area that has been pursued to a significant extent has been the theory of money. Beginning with Carl Menger's¹ theory of money's origin, extending through the contributions of Hutt, Rothbard, White, O'Driscoll, and Selgin², there appears to be a distinct line of subjectivist monetary theory.

Of these contributions however, only the ones of Hutt and Selgin examine what a subjectivist approach to the *demand* for money might look like. What both emphasize is that the act of holding money provides a subjective utility yield to the holder. The recognition of this subjective yield from money held is important, but more can be said. A subjectivist approach to the demand for money needs also to examine the nature of this yield, compare it to non-money goods, and explore the relevant opportunity costs of holding money. A subjectivist approach can show that the demand for money is not fundamentally different from demanding non-money goods. As a result, neoclassical and Keynesian models that portray the only opportunity cost of money held as interest-bearing securities are over-simplified, which leads to problematic macroeconomic implications.

The paper is divided into four sections. The first attempts to describe the yield from money held and compares it to the yield from non-money goods. Next is a comparison between the demands for money and near-moneys. The third section brings in subjective cost theory to explore more precisely the cost of money held. The paper concludes with a discussion of some macroeconomic implications.

* The author would like to thank Bill Butos and other members of the Hartford Area Economics Seminar for their comments on an earlier draft and the Institute for Humane Studies at George Mason University for financial support.

¹ Menger-1892.

² Hutt-1956, Rothbard-1978, White-1986, O'Driscoll-1986, Selgin-1987.

2. Utility, availability and the yield from money held

The supposed barrenness of money has perplexed economists from Aristotle onward. Only with the advent of the subjectivist revolution were the first steps made toward identifying precisely what, if anything, is the yield from holding money. The fundamental insight of Carl Menger's³ theory of the origin of money is that money is simply the most saleable of all commodities. In Menger's theory, actors begin with barter exchanges and eventually realize that they can more easily execute such exchanges if they hold stocks of commodities that are greatly desired by other members of the trading community. This brings indirect barter exchanges in which good A is traded for good B which is used only to further trade for good C.

As this indirect exchange process continues, those who have picked B's that are highly desired will be successful in procuring the ultimately desired good C's. Others in the community see the success of those using B's as a medium for indirect exchange and begin to use those goods in the same way. This process of imitation further increases the desirability of B's, making them more effective as media of exchange. As a result, money's primary function, serving as a medium of exchange, rests on the social expectation that others will accept money in exchange. That social expectation grows out of an exchange process that discovers which goods are more or less saleable by inducing traders to demonstrate their private preferences in public acts of exchange. Eventually this process reveals the one good which is the most saleable. This is what Menger defines as money.

The thrust of Menger's theory is that it is those goods that are inter-subjectively the most desirable that will be used as media of exchange. Menger is very clear to emphasize that what he calls saleability is a concept that has been almost completely ignored by thinkers of this time, precisely because the theory of exchange "has been almost exclusively directed to the *quantities* of commodities exchanged".⁴ To understand saleability one must look at the subjective purposes and plans of traders, not simply the quantities traded.⁵

W.H. Hutt translated Menger's theory into a theory of the nature of the yield from money held. Hutt argued that this yield is the subjectively valued service of availability.⁶ When one holds a stock of money, one has something available, waiting to perform its ultimate service of exchanging for non-money goods and services. As Hutt insisted, "the act of passing [money] on is merely the *culmination* of a service... which it has been rendering to the possessor."⁷ Hutt compared the yield from money to the yield from a standing fire truck. Surely it is not the case that there is no benefit flowing from such a truck. Rather the service it renders is being available in case it is needed. Money held is no different.

³ Menger-1892.

⁴ Menger-1892, p. 244, emphasis in original.

⁵ For more on the subjectivist emphasis of Menger's theory of money, see O'Driscoll-1986 and Horwitz-1989.a.

⁶ Hutt-1956, p. 213.

⁷ Hutt-1956, emphasis in original.

The connection between Hutt and Menger lies in recognizing that the availability services that money provides flow from it being the most saleable good. To be available to be exchanged for anything at any time requires that the good have the degree of saleability that Menger describes. The nature of Hutt's availability services is that they are a subjective return to holding an item that *others* also subjectively value a great deal, thus permitting the item to be easily exchangeable. When one chooses to hold wealth in the form of money, one is simply purchasing these availability services.

In an important sense then, money is no different from any other economic good. Ultimately, every good is acquired with the intent of using its services to satisfy some subjective end. Automobiles, televisions, toothbrushes and cumquats are all acquired because the stream of services they render provide utility, and money is no exception.⁸ Money is simply just another asset that provides utility, in this case in the particular form of availability services.

To subjectivists, physical goods are only means to the fulfilling of various subjectively valued ends, so a good does not need to provide physically observable services to be valuable. Money in some sense is the exemplar of this view, as money, particularly paper and bank money, has little, if any, use value. Money stocks are accumulations of pure exchange value, and that value in exchange is the source of the subjective yield reflecting the ease with which money can be traded for goods with use values.⁹ As Hutt succinctly argues¹⁰ : "Money assets (held as consumers' capital goods) render non-pecuniary gratifications just like those rendered by [for example] furniture."¹¹ Money stocks are only one of the innumerable forms in which wealth can be held as utility-yielding assets.

3. Money and near-moneys

In the neoclassical literature, the concept of the demand for money begins with its relationship to the interest rate as presented in Hicks.¹² He poses the basic question that pervades modern monetary theory (p. 18) :

⁸ A related neoclassical approach is Stigler/Becker-1977.

⁹ Marx recognized this as early as the Paris Manuscripts (1864, p.168), where he describes money as "the alienated ability of mankind." In *Capital* (1867), he describes in more detail how money comes to represent pure abstract exchange value. Other commodities, he argues, have use-value to others but not to their producer. Only money has only exchange value to everyone and use value to no one. In fact it is the development of money that permits capitalists to store up exploited surplus value without limit, because it is easier to store such value in the form of monetary exchange value than as use values of physical objects, as under feudal farming. This point is discussed at more length in Roberts/Stephenson-1973.

¹⁰ Hutt-1956, p. 206.

¹¹ See also Hutt (p. 197) : "[M]oney assets offer prospective yield just as the rest of the assets possessed by individuals, firms, banks, or governments [do]."

¹² Hicks-1935.

What has to be explained is the decision to hold assets in the form of barren money, rather than interest - or profit-yielding securities ... So long as rates of interest are positive, the decision to hold money rather than to lend it, or use it to pay off old debts, is apparently an unprofitable one.

Hicks argues that money is held because investing in interest-earning assets involves transactions costs ; the act of buying a bond involves sacrificing more real resources than does acquiring money. It is at least possible that the interest return minus the transactions costs could be negative, making money's zero return preferred.

While this approach is consistent with the observed trade-off between interest rates and the demand for money (see below), it does not offer an explanation of what money does, nor what it provides to its holder, only that other relevant substitutes may be worse choices. By immediately portraying the choice between money and near-moneys as between barrenness and interest, Hicks starts off on the wrong track. When one "objectifies" the returns from each choice this way, one is led to both ignore the yield on money held as outlined above and misunderstand the choice between holding financial and non-financial assets. The notion of a subjective yield on money can help to explain better the relationship between money and near-moneys.

One way in which money differs from other goods is that it is much harder to identify any particular good as money because goods can have aspects of money, yet not be full-blooded moneys. What can be said is that financial assets have degrees of "moneyness" about them, and that different financial assets can be placed along a moneyness continuum.¹³ Hayek argues that : "it would be more helpful...if "money" were an adjective describing a property which different things could possess to varying *degrees*."¹⁴ A pure money asset is then defined as the *generally accepted* medium of exchange. Items which can be used as media of exchange, but are somewhat or very much less accepted are classified as near-moneys.¹⁵

Nonetheless, money and near-moneys share an important feature Like all other objects of exchange, their desirability is based on their utility yield. However in the case of near-moneys, that yield is not simply availability. Near-moneys do yield some availability services, but not to the degree of pure money. The explanation is that by definition, near-moneys are not as generally acceptable and therefore cannot be available for all the same contingencies as pure money. For

¹³ The term "moneyness" is taken from Hayek (Hayek-1978.a, p. 52) who attributes it to Fritz Machlup. White (White-1986, p. 302) also uses the term, particularly in emphasizing that moneyness has to be defined in terms of the "plans of individual economic agents." This fits nicely into the Menger-Hutt view from above.

¹⁴ Hayek-1978.a, p.52. Emphasis in original.

¹⁵ Also see White-1986 for an elaboration of this view. Hayek's and White's view can be seen as descending from Mises-1980 who talks of money in the narrow sense and money in the broad sense. This dichotomy can be viewed as referring to a pure money asset (i.e. the outcome of a Mengerian evolutionary process) and near-moneys (or money substitutes), respectively.

example, as White argues¹⁶, a passbook savings account is not the same as pure money because, aside from being not directly transferrable (one has to go to the bank and make a withdrawal, unlike a demand deposit), it is not generally acceptable. Even a demand deposit is not quite as available as currency or coin is — some places will not accept checks. These kinds of financial assets have lower availability yields than pure money because they are simply not as marketable.

To compensate for their availability yields, these assets give an interest yield. An interest-bearing account involves both an availability yield and an interest yield. A checkable money market mutual fund also has both, though its interest yield is somewhat higher and its availability yield somewhat lower than standard demand deposits because most such accounts require that any checks have a minimum amount, such as \$500. This makes them noticeably less saleable than regular demand deposits. As we move all the way to something like a bond, the availability yield drops to near zero, while the corresponding interest yield rises. This continuum from pure money to distant money substitutes parallels the traditional measures of M1, M2 and M3. What a subjectivist approach adds though, is an understanding of what it is that gives a financial asset its liquidity and why interest returns appear to rise as we move away from M1.

This continuum might be characterized in the following way. Financial assets have a total yield which we can define as T , which is made up of an availability yield (a) and an interest yield (r), such that $T=a+r$. The closer a particular asset gets to money the higher becomes the fraction a/T and the lower r/T . As we move away from pure money, the relative size of the fractions reverse. Of course, T is a subjective yield, as both the value of the availability services and the utility from an interest return are ultimately judged by the holder.

This framework can help to understand the empirical relationship between the demand for money and the interest rate.¹⁷ As is well-known, a rise in the rate of interest will cause the quantity of money demanded to fall. In addition, the subjectivist framework can also explain the phenomena Hicks was interested in. As interest rates rise, the total yield from financial assets farther from pure money rise relative to pure money. As a result, holders of financial assets will tend to transfer their holdings to assets with higher T values, in this case, things with less moneyiness. If the relevant money is defined as, say, M1, then a fall in the quantity demanded will be observed as this shift takes place. As more wealth is held in these money substitutes, it tends to increase the price of such assets and drive down their interest rates. In the case of assets like interest-bearing checking accounts, a significant movement of funds from currency to demand deposits would tend to force down interest rates as banks try to find new borrowers at their increased level of reserves. In either case, the total yield of near-moneys will fall back and tend to equate with the total yield of pure money.

Traditional attempts to explain the money demand and interest rate tradeoff in terms of the transactions costs of obtaining interest-bearing securities

¹⁶ White-1986, p. 310.

¹⁷ See Laidler-1985 for an exhaustive account of the literature surrounding this relationship.

miss a fundamental point. While this might be a useful way of seeing the tradeoff between pure money and money substitutes, it cannot explain why people choose to hold financial assets *in general*, and pure money in particular, *instead of purchasing goods and services*. The textbook money versus bonds model makes it seem as though bonds are the only alternative to holding pure money, however the argument so far should indicate that this is not necessarily the case. Like all other goods, the yield from money is expected utility and, in a basic sense, money and near-moneys as a group can trade off against the expected utility from other goods and services.

4. Subjective cost theory and the demand for money

To understand the ultimate determinants of the willingness to hold money, an exploration of what the costs of money held are and how they can be characterized is needed. Specifically, subjective cost theory can be explicitly added to the approach being developed.

Subjective cost theories date all the way back to Menger and Wieser, though the most recent versions can be found in Buchanan, Buchanan and Thirlby, and Kirzner.¹⁸ Buchanan defines cost as “[the chooser’s] own evaluation of the enjoyment or utility that he anticipates having to forego as a result of selection among alternative courses of action.”¹⁹ Specifically, this definition of cost is what Buchanan calls the “choice-influencing” one ; it is the hurdle that one must leap in order to make a decision. What influences such decisions are the actor’s perceptions of desirability of the various alternatives open to her, so that the cost of the road that is taken is the foregone expected utility of the road not taken. In this sense, as Buchanan argues, cost and choice are inextricably linked.

Of course every decision has its consequences, and in some sense these are the cost one has to bear as a result of choosing a particular way. Buchanan refers to these as “choice-*influenced*” cost. To borrow Kirzner’s example, itself borrowed from Alchian, consider the construction of a swimming pool.²⁰ The choice-influencing costs are the various expected utilities that the owner sacrifices in deciding to use his resources to build a pool. Instead the resources could have bought a car, a college education, or been invested. The choice-influenced costs are all those things that deciding to build a pool entail : cleaning it, covering it, dealing with neighborhood children and their noise. All of these latter costs are the result of the decision, but not the explanation of it. The expected utility sacrificed *is* the explanation of the pool owner’s action, precisely because it is only by deciding that the expected utility of the pool is greater than the expected utility of the next best available alternative that the owner decides to build the pool.

¹⁸ Menger-1981, Wieser-1967, Buchanan-1969, Buchanan/Thirlby-1981, Kirzner-1986.

¹⁹ Buchanan-1969, p. 43.

²⁰ Kirzner-1986.

Kirzner argues that²¹ : “the subjective opportunity cost concept permits us to recognize that costs help *explain* economic behavior not because costs represent definite objects *displaced*, but because they represent perceived utility prospects deliberately sacrificed.”

There are two ways in which this notion of cost is a subjective one. First, the utility that is being referred to is subjective. Only the chooser is best able to determine the utility that any choice provides, no outside observer can definitively measure that utility.²² Second, and perhaps more important, such costs are subjective because they are never objectively realized. As Buchanan says²³ : “Cost can never be realized because of the fact of choice itself : that which is given up cannot be enjoyed.” What is given up in a choice is by definition what was not chosen, so the “measure” of that cost must necessarily be the *expected* utility of the sacrificed alternative. Such expectations can be definitively described only by the chooser.

To explain why people choose to demand money, one needs to examine what the possible opportunity costs of doing so are. Neoclassical theory argues that the interest rates on bonds, or other securities, are the next best alternative use and that such rates provide us with a loose guide to the costs of holding money. However, the approach developed so far provides several reasons to question the neoclassical model.

Recognizing that the yield from money held is simply a utility yield no different from that of any other good, subjective cost theory can now be added. When an actor is facing a decision to hold wealth in the form of money, she is deciding between a number of prospective utility streams. We can broadly categorize those streams as the utility from non-financial assets and the utility from both the availability and interest returns from non-money financial assets. There does not seem to be an *a priori* reason to suspect that the utility streams from either category are more or less important. All non-money goods, both financial and non-financial, are relevant substitutes for money.

When considering how to allocate one’s wealth among alternative uses, one attempts to achieve what one perceives to be the expected utility-maximizing array of goods, given the limited knowledge and inherent uncertainty of the marketplace. Holding one’s wealth in the form of money is one among those choices. The particular stream of services money provides is what Hutt calls availability services. One can view the choice to hold money as a decision to “purchase” availability, just as the choice to hold wealth in the form of a book is a decision to purchase book services.

Therefore, the cost of holding money is the expected utility sacrificed from the next best alternative use. These alternative uses include all utility-yielding

²¹ Kirzner-1986, p. 143, emphasis added.

²² This is not to say such information is totally unavailable to outside observation. For example, much of the work of historians, economic or otherwise, is to dig and try to find out what it is that decision-makers were considering at the point of choice. In this sense, the term subjective need not be taken as literally “private” or “inaccessible.” The textual records of the past, and present, can at least provide clues to such matters, though no historical work can precisely state the subjective costs of a particular decision.

²³ Buchanan-1969, p. 43.

goods, not just interest-bearing securities. Those rates of interest may play a significant role in determining portfolio choices among financial assets, but are insufficient to explain why particular financial assets are held rather than non-financial ones. Such a choice can only be characterized in terms of a theory that recognizes both the subjective utility yield of money held and the expected subjective utility sacrificed as the cost of holding money. As Hutt puts it²⁴ :

“all goods and services have the same scarcity significance, i.e.,... they all stand in an identical relation to human choice and exchange. It seems to be that money and monetary services ought to be included under this principle...”

5. Some macroeconomic implications

One of the important advantages of a more subjectivist approach to the demand for money is that it has several implications for the way in which macroeconomic disturbances take place. Despite the emphasis on the similarities between money and non-money goods in the preceding sections, there are some important differences. The main one is that money has no market of its own, rather its market is comprised by all of the markets for the goods it trades against. As a result, disequilibria in the money market spill over into all other markets. For non-money goods, disequilibria can be remedied through a movement in their prices. In the case of money, its “price” is simply a composite of the prices of all other goods. Thus adjustments in the value of money are made through adjustments in the values of all other goods.²⁵

This is why changes in the value of money have pervasive effects. There is no way for the impact of excess supplies or demands for money to be ironed out within the money market — the adjustment must take place through the myriad of individual prices in all of the markets in which money trades. A subjectivist approach reinforces this argument in two ways.

First, by emphasizing that money is a substitute for all other goods and services, the subjectivist approach indicates the incompleteness of Keynesian models of the speculative demand for money which show monetary disequilibria as flowing into the bond market using the interest rate as the adjustment variable.²⁶ Bonds are simply not the only substitute for money. In Keynesian models this implies a very high interest-elasticity of money demand (or a flat LM curve in the IS-LM model). From this, textbook Keynesian models go on to conclude the inefficacy of monetary policy. In the process, the Keynesian model throws out the Classical story where excess supplies (demands) of money drive up (down) the price level, instead arguing that they will drive down (up) interest rates.

²⁴ Hutt-1956, p. 196.

²⁵ See Yeager-1968, for more on this point.

²⁶ Cf. Hutt-1956, p. 215 : “Once the productiveness of money assets is recognized, the notion that the rate of interest is determined by the demand for and supply of money assets, or the demand for and supply of the services of money assets (“liquidity”), ceases to have meaning.”

When one models bonds as the only substitute for money, it will indeed be true that even small changes in the interest rate will affect the quantity of money demanded and that the Keynesian policy implications will follow. Friedman's model picked up on precisely this point and argued that the demand for money depended upon several different factors, including rates of return on equities and durable goods, changes in the price level, levels of human and non-human wealth, and a portmanteau variable.²⁷ In comparison to Keynesian models this was an improvement, as Friedman recognized that money was an asset like other goods and one had to look at all of the relevant substitutes.

The subjectivist approach indicates that Friedman simply did not spread his substitutes wide enough. One need not restrict money's relevant substitutes to the several variables Friedman uses — rather any and all utility-yielding assets are substitutes for money. The demand for money will be affected by changes in the utility yields of all other goods, not simply the flow of interest yields from bonds. Of course changes in the interest rate will affect the kinds of financial assets held, but of themselves cannot explain the choice between financial and non-financial assets. The implication is that the original Classical view is basically correct: monetary disequilibria will be felt as changes in the prices of all other goods, not just bonds.

A second advantage of the subjectivist approach is that it can help clarify the process by which monetary disequilibria pervade other markets. The Cambridge real-balance approach provides the essential insight that money holders wish to hold some desired level of real purchasing power. When the monetary authority issues excess supplies of money, actors find themselves with more real purchasing power than desired and shed the excess balances by increasing their demand for goods and services which leads to rising prices. The subjectivist approach can explain this as simply an application of marginal utility theory.

If actors are equally satisfied with the marginal utility per dollar ratios across all goods, the subjectivist view would argue that this array of ratios should also include the marginal utility provided by the stream of availability services from the dollars of wealth invested in money. When excess supplies of money enter the system, actors find their money balances increasing, which causes the marginal utility from money's availability services to fall. In essence, excess supplies of money force money holders to overinvest in availability services. To remedy the situation, money balances are reduced by obtaining other utility-yielding goods, causing their marginal utility to fall as the marginal utility of money rises. This continues until the perceived marginal utility per dollar ratios are again equalized across both money and non-money goods. The effects of excess supplies of money are the same as in Classical theory.²⁸

²⁷ Friedman-1973.

²⁸ It should be pointed out that an analogous argument holds for deficient supplies of money. Actors will there try to draw down their stocks of non-money goods, raising their marginal utility per dollar ratios, in order to obtain more of money's availability services, driving its ratio down until all are equal again. The parallels between inflation and deflation are not always recognized in the macroeconomic literature, especially by those who consider themselves subjectivists. See Horwitz-1989.b, p. 431, fn. 18.

A subjectivist approach to the demand for money is also consistent with one of the most important of subjectivist contributions to macroeconomics, namely the notion of the relative price effects of inflation. The Austrian theory of the business cycle has long emphasized that changes in the supply of money do not affect all prices equally. Rather, the fact that such changes occur at specific places and specific times means that some prices will be affected more than others. A subjectivist approach to the demand for money can assist in clarifying this point. By realizing that all goods are, in an important sense, substitutes for money and that no one but the actor precisely knows the utility flows that all such goods provide, it becomes clearer that there is no way to predict the direction that excess supplies of money will take. Which goods, and how much of them, will be acquired in order to re-establish previous marginal utility ratios will depend on where excess money is injected and on the subjectively known costs and preferences of those who receive it. Some entrepreneurs might choose to invest in heavy machinery, some might increase their demand for labor, some might make other choices. But not focusing enough on the subjective nature of the marginal utility of money, perhaps because of its inability to specify precisely what it was, the Cambridge approach lent itself to an excessively aggregative interpretation of the Quantity Theory which overlooks the numerous individual choices that underlie the important relative price effects of inflation.²⁹

One last macroeconomic implication deals with the importance of monetary policy. Subjectivists tend to defend market institutions on the grounds that they do a better job in enabling actors to coordinate their demands with producers' supplies than does government planning. In particular, since the market is comprised of the complex interactions of the subjective perceptions of actors (both their wants and their opportunity costs), there is no way that a planner could hope to match the job done by exchange, prices, and profits in making this subjective knowledge available socially. The discovery process of the market creates and reveals knowledge that planners would have no clue even existed, even if they were in a form that could be accessed.³⁰

One implication of the subjectivist approach is that money is not different. To the extent one is unwilling to believe that non-market institutions could do a better job in ascertaining the appropriate supply (and characteristics) of a non-money commodity such as shoes, so should one be doubtful of the ability of a monopoly central bank to do the same with money. Money is a bundle of subjectively evaluated characteristics which are no more available to a central banker than consumer wants about shoes are to a central planner. Hayek argues with respect to central banks that³¹ :

²⁹ Humphrey-1984, argues that many outside of the Austrian tradition were aware of relative price effects, despite Austrian claims to the contrary. While that may have been true at one time, certainly relatively few modern neoclassical models have tried or been successful at incorporating them. Indeed the modern revival of the aggregative Quantity Theory has been in the hands of the New Classical economists, who also have difficulty explaining the yield on money held (see Selgin-1987). The argument of this paper suggests that these two views may be related due to a lack of subjectivism on the part of the New Classical economists.

³⁰ See Hayek-1978.b, and Lavoie-1986, for more on the role of markets as process for discovering forms of knowledge that would be inaccessible otherwise.

³¹ Hayek-1978.a, p. 98.

A single monopolistic government agency can [not] possess the information which should govern the supply of money ... Indeed, if, as I am convinced, the main advantage of the market order is that prices will convey to the acting individuals the relevant information ... [money] should be part of the self-steering mechanism by which individuals are constantly induced to adjust their activities to circumstances on which they have information only through abstract signals of prices.

Precisely because money is like other goods in the ways outline above, so should subjectivists be interested in finding market-oriented alternatives to central banking.

This is precisely what has happened in the 1980s in the work of White, Selgin³² and others. A subjectivist approach to the demand for money fits very nicely with the policy analysis undertaken by other aspects of subjectivist monetary theory. The policy proposal of competitive currencies can be solidly grounded in other aspects of subjectivist economics. Once it is seen that money has fundamental similarities to other goods, it is natural to think that the same sets of institutions that ensure the orderly production of other goods will do the same for money.

6. Conclusion

Once one recognizes that money is not barren and that it gives a stream of subjective utility, in the form of availability services, to its holder, then a full-blown subjectivist theory of the demand for money follows. Such a theory not only indicates potential problems with neoclassical approaches to the subject, but also fits nicely with other aspects of the subjectivist research program. In particular, a subjectivist approach to the demand for money can help further our understanding of many of the unique aspects of macroeconomic theory and policy in the subjectivist tradition. It should be reiterated that what has been presented here has been intentionally referred to as an “approach” rather than a fully articulated theory. Much more needs to be done, but hopefully the approach developed herein will serve as a step in that direction.

³² White-1984, Selgin-1988.

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