

REJOINDER TO HANSEN AND NEWMAN ON GOLD*

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Resumen: Hansen y Newman (HN) critican a Barnett y Block (2004, 2012, desde ahora BB) por defender la postura de que los descubrimientos de oro, que suponen dinero oro adicional en un mercado libre, son socialmente beneficiosos. HN, en contraposición, toman la postura de que como cualquier cantidad de dinero oro puede hacer el mismo “trabajo” monetario que cualquier otra cantidad, que estas nuevas adiciones no son socialmente beneficiosas. Más bien constituyen un fallo de mercado. No sólo resultan problemáticas las adiciones a la masa monetaria desde su perspectiva, pero también supone la consecuencia lógica de que debemos disminuir la cantidad de dinero para evitar el “fallo de mercado”, ya que desde la perspectiva del pasado, la cantidad presente de dinero fue incrementada de su nivel en su momento. Este trabajo pretende defender la perspectiva de BB frente a la de HN.

Palabras clave: Oro; dinero; fallo de mercado.

Clasificación JEL: B25; B53; E31; E42; E51.

Abstract: Hansen and Newman (HN) criticize Barnett and Block (2004, 2012, hence BB) for taking the position that gold discoveries, which emanate in

* We thank an anonymous referee of this journal for very thoughtful comments, not all of which we had the good sense to incorporate into this paper. We did, however, follow some of his advice, which greatly improved it. The usual stipulations of course apply: all remaining errors and infelicities are our sole responsibility, not his.

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additional free market gold money, are socially beneficial. HN, in contradistinction, take the view that since any amount of gold money can do the same monetary “job” as any other amount, that these new additions are not socially beneficial. Rather, they constitute a market failure. Not only are additions to the money stock problematic from their point of view, but it also logically follows that we should decrease the quantity of money in order to ward off “market failure” since from the perspective of the past, the present quantity of money was increased from its level at that time. The present essay attempts to defend the perspective of BB vis-à-vis that of HN.

Keywords: Gold; money; market failure.

JEL Classification: B25; B53; E31; E42; E51.

We are extremely grateful to HN (2022). Their essay offers several new and important insights into money, monetary theory, inflation, the gold standard and several other macroeconomic issues. It cannot be denied that they also severely criticize BB (2004, 2012); it is our claim, however, that they do so erroneously. As it happens, even this mistaken analysis of theirs makes a significant contribution in that it touches upon welfare economics, inflation, market failure, and does so in an illuminating manner. So that there can be no question of putting erroneous words in their mouths, we shall quote them voluminously, and then engage in critical commentary.

According to HN: “Barnett and Block argue that increasing the money supply can increase welfare, as it allows for additional transactions that would otherwise have been too costly. This line of reasoning is mistaken, since there is nothing to preclude the same transactions from taking place at lower nominal prices. While Barnett and Block are correct that an increase in the supply of market-produced money has positive welfare effects, the explanation for this must be found elsewhere.”

We will not say that there are more contradictions in this one short paragraph than you can shake a stick at; that would be an exaggeration. But there are a few. As well, they are on thin ice

about Austrian economics, which they are intent upon defending; they also engage in several errors in this regard.

First, the contradictions: these authors (HN) acknowledge that an additional amount of market-produced money has positive welfare effects. But they deny it too, on the ground, as they also aver, that "... there is nothing to preclude the same transactions from taking place at lower nominal prices." But if the additional market-produced money is not needed, since "the same transactions (could take) place at lower nominal prices" from whence springs the "positive welfare effects?" Are we misunderstanding them? Do they mean to say not that an additional amount of market-produced money is not needed, but, rather, that any, or the first little bit of market-produced money, is not needed? This cannot be, however, since, surely, as Austrian economists in good standing, nay, as any type of economist whether in good standing or not, they must acquiesce in the notion that the use of a market-based money is preferable to barter. Thus, the very first unit of the monetary metal makes an economic contribution. And, of course, that first unit of money is all that is ever necessary. Every addition to the stock of money since then has been economically wasteful in their view. That is, one ounce of gold, or, perhaps, even, one gram, would have sufficed, thank you very much, as an operational gold standard. They, of course, say nothing of the kind. Rather, this is an implication of their thesis. In pointing this out, this is our attempt at a *reductio ad absurdum*.

Here is a second instance of HN contradicting themselves. They conclude their essay as follows: "...while it is true that any quantity of money can do all the work money can do, an increase in the supply of money called forth by a change in the data of the market is still socially beneficial. When money is supplied by the market, increasing its supply will satisfy consumer wishes and improve welfare, even if there are no benefits in the form of nonmonetary uses of the increase in gold." Whence the social benefit? Which "consumer wishes" are satisfied by additional money, if not monetary uses? But, splutter, splutter, they just got finished stating that additional gold money was not "socially beneficial." Here, they are taking this all back. Can they defend themselves against the charge of logical contradiction on the ground that here they are only

discussing “money called forth by a change in the data of the market”, and BB were focusing on an adventitious gold discovery not called forth by anything? This would be a good try but will avail them nothing. For part of the “data of the market,” surely, is the desire of the gold miner to earn a profit. Whatever else could have induced him to first search for gold, then set up an operation to mine it, and then purchase something with the gold money into which he had converted his discovery?

Second what are their mistakes? The first one involves an infinite regress.

Suppose that we have achieved a gold standard in an otherwise Rothbardian free enterprise world. But, then, magically, all but one ounce of gold disappeared. Could we still remain on the gold standard with so little of this precious metal? Well, possibly. HN’s determination to the effect that “there is nothing to preclude the same transactions from taking place at lower nominal prices” might be of help to us. It is not a logical contradiction to posit that purchases and sales could take place with the intermediation of but one trillionth of an ounce of gold.¹

On the other hand, back to reality. It is difficult to avoid the purely empirical matter that we would no longer be on the gold standard with so little of this element available to us. Rather, we would instead switch to silver or platinum or copper or some other metal. But if, as an empirical matter, a certain minimum amount of the money commodity is needed, and one ounce simply will not do, then we may deduce that there is an optimal amount of gold necessary to protect the gold standard from the inroads of these other metals. What, pray tell, is this optimum?

HN are wedded to the answer that whatever amount is now available is the right amount. They are obligated to take this stance since they just got finished claiming that BB (2004, 2012) are wrong when they maintain that an additional amount would be beneficial. But this answer will avail them nothing. For, let us posit that we are now, in 2024, at the time of the present writing, and that

¹ Maybe, we are in the realm of one novillionth of an ounce of gold? Sorry, we are too lazy to do the math. However, the number of atoms of gold per gram thereof is approximately 3.05×10^{21} a very large number, indeed.

some amount of gold, call it 100 tons, is presently available for monetary purposes.² But let us suppose that there were only 99 tons available in 2023 and 98 tons in 2022, etc. Then HN can no longer maintain that 100 tons is optimal. Why not 99? Or 98, etc.? We are, well, they are, stuck in an infinite regress going back to the epoch when gold was first used as money, presumably, with only our proverbial one ounce of it available for monetary uses.

They have painted themselves into a rather precarious corner here. They maintain that “whatever is, is right” in terms of the amount of gold, but if this system initially started out with but one ounce of gold, they must also hold that no previous accretion was ever justified. Had the market followed their advice, there would still be only one ounce of gold in circulation,³ and it is exceedingly unlikely that we would be on a gold standard at all.

Here is yet another difficulty: these scholars argue “... that an increase in the supply of commodity money is in essence and effect no different from the production of other goods in an unhampered market economy.” But, surely, they mean to make an exception for gold, particularly if it is used to add to the money stock? At least, this is their avowed thesis, and here they are once again contradicting themselves by denying this primordial element of their thesis.

They say this: “The only other attempt at a similar analysis is Barnett and Block (2004; 2012). However, this analysis proceeds on fundamentally different lines. Barnett and Block (2004, 47, 49) argue that increasing the money supply can increase welfare, as it allows for additional transactions that would otherwise have been too costly. This line of reasoning is mistaken, since there is nothing to preclude the same transactions from taking place at lower nominal prices.”

² We simplify matters by assuming that the ratio of money to non-monetary uses of gold (teeth, jewelry) remains constant.

³ Modern technology could perhaps divide a single ounce of gold into a trillion physical parts; we have no idea if this is true or not, and no interest in trying to find out. But this would have been impossible in historical or prehistorical times when gold was first used as money. How, then, could this have been accomplished? Simple. Just print up a trillion pieces of paper each one indicating title to a trillionth of an ounce of gold.

Consider that the issue here concerns dynamic adjustment to disequilibrium; i.e., to felt uneasiness. As Mises states⁴: “Economics is a branch of praxeology, the aprioristic theory of human action.”⁵ “The incentive that impels a man to act is always some uneasiness.” (Mises, 1998, p.13). Moreover, (Mises, 1998, p.11) has stated: “Action ... is a person’s conscious adjustment to the state of the universe that determines his life.”⁶ Further (Mises, 1998, p.14) has written: “But to make a man act, uneasiness and the image of a more satisfactory state alone are not sufficient. A third condition is required: the expectation that purposeful behavior has the power to remove or at least to alleviate the felt uneasiness. In the absence of this condition no action is feasible. Man must yield to the inevitable. He must submit to destiny.”

Here is the next attempt of HN to overturn BB:

“Barnett and Block (2004) correctly note that the logical implication of the alleged uselessness of new gold money is that an unhampered market economy with a gold standard would waste resources on money production, and that this would have to be considered a market failure.”

HN, perhaps, do not realize what an important concession is this statement of theirs. It almost totally undermines their criticism of BB. There are several plausible synonyms for “Austrian” economics. One of them is the subjectivist school of economics. This is buttressed by this statement of Hayek’s (1979, pp. 52-53): “And it is probably no exaggeration to say that every important advance in economic theory during the last hundred years was a further step in the consistent application of subjectivism.” Another might be the “free enterprise school of thought” for there is nary an Austrian economist who does not favor, extol the virtues of, the unhampered, unregulated market. Certainly, “praxeological school” would qualify, at least for those Austrians who follow Mises and Rothbard, but not Hayek.

⁴ *The Ultimate Foundation of Economic Science*, 2nd ed., 1978 Sheed Andrews and McMeel, Inc., p.73.

⁵ Source: <https://oll.libertyfund.org/page/mises-on-popular-errors-and-economic-method>

⁶ Mises, 1998, p.11.

Yet another would be the “anti-market failure school” it if were not so awkward. For this, too, is central to the views of virtually all Austrian economists. Austrians have felled many trees in the past denying any and all so-called market failures, and in the modern day have made these points electronically. There simply are no market failures, not monopoly,⁷ not public goods,⁸ not externalities,⁹ not inequality,¹⁰ not the dozens if not hundreds of other market failures our interventionist friends have dreamed up,¹¹ and, not, also, mining gold, and using some of it monetarily.

Someone discovers and mines gold, and turns a portion of it to money, in the free enterprise system. According to HN this is a complete waste of resources, since the economy can get along exactly as well with the previous amount of gold money in circulation, as with the newer, larger, amount. Were the state, then, to ban this act of the gold miner,¹² we would be more prosperous than under a regime of economic freedom. This is compatible with Austrian economics? It simply is not. It buys into interventionism, certainly not something the praxeological school is or should be associated with.¹³

⁷ For an Austrian critique of neoclassical monopoly theory, see Anderson, et. al., 2001; Armentano, 1999; Armstrong, 1982; Barnett, et. al., 2005, 2007; Block, 1977, 1994; Block and Barnett, 2009; Boudreaux and Costea, 2003; DiLorenzo, 1992, 1996; DiLorenzo and High, 1988; Henderson, 2013; High, 1984-1985; Hull, 2005; McChesney, 1991; McGee, 1958; Rothbard, 2004; Shugart, 1987; Smith, 1983

⁸ Rothbard’s (1997, 178) *reductio absurdum* of public goods is as follows: “A and B often benefit, it is held, if they can force C into doing something. ... [A]ny argument proclaiming the right and goodness of, say, three neighbors, who yearn to form a string quartet, forcing a fourth neighbor at bayonet point to learn and play the viola, is hardly deserving of sober comment.” See also Amos, 2022; Barnett and Block, 2007, 2009; Block, 1983, 2000B; Cowen, 1988; De Jasay, 1989; Fegley, et al, 2021; Holcombe, 1997; Hoppe, 1989; Hummel, 1990; Osterfeld, 1989; Pasour, 1981; Radnitzky, 1989; Rothbard, 1997; Schmidtz, 1991; Sechrest, 2003, 2004A, 2004B, 2007; Tinsley, 1999.

⁹ Barnett and Block, 2007, 2009; Block, 1983, 1993, 2003; Book, 2021; Cordato, 1992; Hoppe, 2003; Lewin, 1982; Rothbard, 1982; Santoriello and Block, 1996; Terrell, 1999.

¹⁰ Block, 2000A, 2014A, 2014B; Buchanan, 2014; Cathey, 2020; Engelhardt, Lingenfelter and Block, 2016; Fleisher, 2014; Flew, 1986; Gordon, 2021; Henderson, 2022; Macdonald, 2020; Mulcahy and Block, 1997; Murray, 2005; Rothbard, 1971, 1974, 2017;

¹¹ One of Block’s many favorites is “yes men.” See Block (2001)

¹² Not the act of mining, and turning the proceeds into jewelry, false teeth, etc., but rather that of adding even a small bit of it to the money stock.

¹³ See also Bagus, Howden and Huerta de Soto (2021).

It is impossible to overestimate the importance of this deviation of HN's from Austrian theory. Gold mining, when part of the new product is allocated to serving as money, instead of adding to national wealth, actually detracts from it? There is no other natural resource of which this can be said, not silver, not copper, not oil, not anything, and yet these resources, too, can be used as trade intermediaries, e.g., money. Certainly, they can be used for purposes of barter, which, if we apply HN theory to them, would then be wasteful. To put it more succinctly, *no* voluntary actions, including converting gold from non-monetary to monetary uses and putting newly produced gold to monetary uses, are ever wasteful, certainly not *ex ante*.

Next, consider this critique of HN's:

“Barnett and Block defend the gold standard by finding social benefit in additional transactions that are made possible by an increase in gold money production. They do not explain, however, why these transactions could not occur at lower prices. That is, if an increase in demand for money is not met by an increase in the supply of money, a new monetary equilibrium is reached as market participants temporarily increase their labor supply (or otherwise sell goods and services) and restrict purchases, which results in a lower price level and a higher PPM. No new money is required to facilitate these transactions in the transition from one PPM to another. Therefore, the social benefit of expanded gold production must be found elsewhere. One difficulty with claiming the existence or nonexistence of a social benefit to money production is the inherent indeterminacy of gains and losses as market participants unevenly and unpredictably spend and hold the new money, causing an unevenness in changes in prices and incomes.”

Let us consider, in some detail, the “social benefits” of mining gold in order to purchase goods and services with the proceeds, that is, adding it to the money stock.¹⁴ An entrepreneur hires

¹⁴ Spufford (1988) investigated the 11-12th century revival of European economy, when the only option for increasing monetary means was adding new coins through gold mining—and there were great efforts to mine and coin gold to respond demand for new gold coins.

several employees to go and search for gold for him. He equips them with helicopters, gas, etc. He pays 100 t oz. of gold for the labor. To what extent did he value their services? At more than 100 t oz. of gold, otherwise he would have scarcely agreed to this labor contract. Thus, he gains "social benefits" at the very least *ex ante*, and perhaps *ex post* as well; the employees benefit as well, *ex ante*, otherwise they would not have agreed to the labor contract. Happy day, they find some gold for him. The entrepreneur decides to use his newly acquired gold in part to continue his mining operations, in part to make some gold jewelry, and in part to add to his stock of gold money, which he then uses to buy various consumers' goods at different points of time. Assuming that the newly mined gold is homogeneous and using HN's logic, the resources used to mine the gold that is used to continue the mining operations and the resources used to mine the gold used to make gold jewelry was not wasted. However, resources used to mine the gold that is then used as money to purchase consumers' goods was indeed wasted. Yet, HN are on record maintaining "social benefits" cannot thereby increase. One may well ask, who is to decide the best use of resources? Those who have come by them honestly in a free society or "the best and brightest" in Washington D.C.? According to HN, if we choose, for whatever reason(s) to convert all of our non-monetary holdings of gold into monetary gold we are wasting scarce resources.¹⁵ HN have thus taken on the role, horrors, of central planners. It is an implication of their view that the government would be justified, if maximizing human prosperity is the goal, to forbid all such conversions. This is difficult, to say the least, to reconcile with Austrianism being the free enterprise school of thought.

Perhaps there are offsets, so, that, even though all of the market participants engaged in creating new gold money necessarily gain, there are others who lose, and, thus, when their (negative) economic welfare is added to the mix, it is not at all clear that there was a gain in "social benefits." Of course, this ignores the fallacy of interpersonal utility comparisons.

¹⁵ Or misallocating them, which is the same thing.

Well, yes, there are indeed offsets. If not fully anticipated¹⁶ this extra spending of these new gold coins will jack up prices, somewhat.¹⁷ One possibility is that this will dis-accommodate some creditors, who will now be paid back with cheapened gold currency. Much more likely as an empirical matter is that debtors will find themselves having to pay-off their debts in more valuable money. What is really desirable is money of stable value, to the extent possible. Placing all of the adjustments on price declines is most undesirable. Can this count as an offset? Not, at least, for Austrian economists. Not, unless, that is, when someone outcompetes someone else we can count that as a detriment, which we of course cannot; there are no interpersonal comparisons of utility considered valid by praxeologists. How about envy? Someone may regret that our gold miner is now wealthier than he was before. Again, this cannot count, for reasons specified by Rothbard (1956). Nor can external diseconomies count.¹⁸

In football you are not allowed to “pile on.” But that does not apply in the present context. So, we proceed to do just that. Money is a capital good, rather than a *sui generis* good (Barnett and Block, 2005, 2022). The fact that money is a capital good strengthens our critique, else HN would have to defend the position that a voluntary increase in that one particular capital good, gold money in this case, would be excessive; i.e., constitute an *ex ante* misallocation of scarce resources. It is as if they are saying that under full Rothbardian free enterprise, the market tends in the direction of

¹⁶ Little in the real-world economy can be fully anticipated.

¹⁷ Alternatively, this will not be true if productivity has increased sufficiently. In fact, it may be that an increase in productivity has so resulted in an increase in the value of gold money, that the productivity increase was what called forth the conversion of non-monetary gold, including newly produced gold, into monetary gold in the first place. That is, additions to monetary gold may prevent or at least reduce a very *costly* downward movement in prices.

¹⁸ *Op. cit.*, footnote number 6. HN themselves allow this when they write: “Consider the case of a homeowner whose house decreases in value due to an entrepreneur’s decision to produce more houses in the same area. (In the case of gold mining, this new distribution takes the form of an increase in the nominal income and wealth of the successful market actors without necessarily reducing the nominal income and wealth of other market actors. In other words, aggregate nominal income and wealth increase as part of the process.”

too many trucks and too few buses; or an excessive amount of resources spent on oil refining, and an underinvestment in planting coffee trees. The same applies to demands for, and supplies of, money in contradistinction to the demand for, and supply of, money (Barnett and Block, 2009).

The idea that any given stock of money can do all the exchange work that is to be done merely through a decline in prices seems incorrect on natural grounds. To wit, the least price that could obtain is one atom of gold (or other such commodity). If any atom is decomposed into subatomic particles it loses its chemical identity; i.e., the smallest quantity of gold that can exist is one atom of gold.¹⁹ Therefore, the least possible price of any good, say X , is 1 atom of gold/ X . Of course, because of the nature of physical reality, such a price would be impractically low, to say the least. That means, that the lowest prices that could exist would be quite high, or else quoted in uneconomically large quantities of other goods. Therefore, in reality, as ought to be obvious, in any economy, beyond a totally stagnant one, for money to do all the work that needs to be done, it would have to be available in a relatively large quantity.

Further, HN completely overlooked one of our points. That is, in a world of free markets, including commodity/gold money, if the stock of gold money were to remain constant, as they think optimal, and the volume of monetized exchanges were to increase [because of increased productivity, population, etc.] the value of a unit of gold money would indubitably increase. It would do so to the point that for at least some individuals it exceeded its value in alternative uses, e.g. jewelry or industrial purposes. But according to their thinking, it would *not* be economically beneficial for some gold to be converted from non-monetary to monetary uses; i.e., they must think it economically beneficial to maintain a troy ounce (oz t or, sometimes, t oz) of gold in some non-monetary form even

¹⁹ Menger (1892) never contemplating breaking down gold to this extent, but he did write as follows: "... the limits of the effective desire for the precious metals extend also to those strata of population who can less effectively barter, by reason of the great divisibility of the precious metals, and the enjoyment procured by the expenditure of even very small quantities of them in individual economy."

though, after accounting for the cost of conversion, that same weight of gold would be more valuable after conversion to monetary form. This is an absurdity.

In fact, the idea that any amount of gold/commodity money is sufficient to facilitate every indirect exchange means that any additions to the stock of gold must be allocated to non-monetary uses, else we have market failure. That is, increases in monetary exchanges *must* eventuate in price declines. And, if individuals freely choose to add such increases to their monetary stocks that is either irrational behavior or some other failure of voluntary action; i.e., market failure.

Here is yet another problem implicit in Mises' and Rothbard's (not to mention HN's) position. When dealing with changes in the stock of money, the issue is always analyzed in terms of an *increase* in the stock.

However, consider the logic underlying the idea that any extant stock of money is sufficient to mediate all desired exchanges, such that any increase thereof is socially wasteful because that increase could have been diverted to socially-beneficial, non-monetary uses. Then, save in the literally incredible imaginary economy in which the current stock of gold money is precisely that quantity at which gold as a medium of exchange in a barter economy became the money commodity, *any addition to the stock of money stock since then has been a misallocation thereof*. That is, the current stock of money is excessive if it is a commodity money, say gold. One would expect that Mises and Rothbard would have argued that much, or most, or nearly all, of the stock of money should have been converted to non-monetary uses where such uses would have directly added to the stock of human well-being. That is, not only are present additions to the extant stock of gold money misallocations of gold, but so also is virtually all of the current stock. There have been quite a few accretions to the money stock, under a gold standard, since gold became money in the theoretically distant past. We are now talking about an epoch in history when the economy first moved from barter to using gold as money.

The logical implication is that, similarly to the case of an increase in the stock of money, the state should use the necessary resources to force a decrease in the stock of gold used for monetary

purposes, which would free up gold for non-monetary purposes, with concomitant price decreases. And, social welfare, whatever that is, would increase.

Therefore, not only are any additions to the stock of gold used as money socially undesirable, they should be prohibited by the state, as market failures in the form of misallocation of scarce resources having alternative uses; e.g., jewelry, industrial, dental, etc. Furthermore, in order to correct this market failure, the state should divert other scarce resources; e.g., criminal justice system resources such as policemen's, attorneys', judges', juries', and jailers' time, etc., to the goal of eliminating, or at least radically reducing, such misallocations. Individuals should be coerced into such resource reallocations to the point where the marginal *social* benefit of preventing such misallocation of gold exactly equals the marginal *social* cost thereof, such costs and benefits as determined by society's philosopher-kings; i.e., the best and the brightest, in their goodness and wisdom.

Moreover, not only are additions to the gold-money stock socially undesirable, but so also is any quantity of gold now used for monetary purposes above the absolute minimum necessary to constitute gold as money.²⁰ Thus, in a good; i.e., in a free, society, such excess quantity of gold money also should be outlawed, as *contra bonum publicum*. And, the state should use the same types of means to deal with this social problem as it should use to deal with the social problem of additions to the stock of gold money.

One would think, then, that the state should only allow the minimum quantity of gold to be used as money as would be necessary for gold to be the monetary commodity money —any quantity above that would be wasteful. The state should determine the exact quantity of money that constitutes the optimum and then use the necessary force to attain that end.

Furthermore, as we are instructed, (HN, 162): "In short, the optimal amount of money is, at any given time, the real amount [sic] of money—that is, the nominal quantity times the PPM."¹¹ [PPM is an acronym for the so-called purchasing power of money.]

²⁰ Given that our aim is to promote economic welfare.

HN fn11.: "The real amount [sic] of money cannot be expressed as a quantity, since the PPM is not simply the 'reverse' of the 'price level.' It is the reverse of the whole array of money prices. However, it is acceptable as a shorthand expression."²¹

How is one to make sense of this? First we are told that the optimal quantity of money is, at any given time, the so-called "real quantity of money." Second, that this real quantity of money is the nominal quantity times the PPM. Third, that the real amount/quantity of money cannot be expressed as a quantity because the PPM is not simply the reverse of the "price level," rather, it "is the reverse of the whole array of money prices." Fourth, that, nevertheless the PPM "is acceptable as a shorthand expression."

Here are our responses in numerical order to the aforementioned.

1. So-called "real" money is an artificial construct, nay constructs, as it is inconceivable that there might be but one method to convert the actual quantity of monetary gold to some constructed measure of "real" monetary gold. In truth, there is no such thing as the real quantity of money, except the actual quantity of monetary gold at any point in time. Obviously, that is not what HN intend by that term. Rather, they mean, as is standard in economics, some sort of measure of what money can buy. For them, even though the actual quantity of monetary gold remains constant, the so-called real quantity of money can and does vary with fluctuations in prices. And, the concept of real money, in contradistinction to actual money has no doubt caused serious problems both in monetary theorizing and consequent monetary policy.
2. How can the real amount [quantity] of money be the nominal quantity of money times the PPM? Let, RM be the "real" quantity of money, AM the actual quantity of money, and PPM the purchasing power of money, then $RM = AM \times PPM$. But, HN, themselves, acknowledge, in a footnote: "The real amount of money cannot be expressed as a quantity." What

²¹ Hereinafter, we shall no longer correct with a "sic" their use of "amount" when it should be "quantity."

of the laws/rules of mathematics. How can one multiply a quantity, AM, times a non-quantity, PPM, and have the result be a quantity? Suppose AM = 100 gold oz t (a quantity) and PPM (a non-quantity) = fast. What then is the quantity of RM? 100 gold oz.t. But this is “Acceptable,” HN say in fn.11, as a shorthand expression. Consideration of the basic mathematics of units/dimensions in the sense of the International System of Units (<https://www.nist.gov/pml/owm/metric-si/si-units>), shows all of this to be nonsense.²²

We must conclude that HN’s critique of the views of BB is not valid.

Conflict of interest

The authors declare no conflict of interest.

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