William Barnett II
and Walter E. Block

Reply to Curott on the Market for Money

We are extremely grateful to Curott (2010) for his excellent and insightful response to our paper (Barnett and Block, 2009). His "comment" shows evidence of careful reading and great creativity. He does us great honor by subjecting our article to his critical scrutiny. Nevertheless, we cannot quite see our way clear to agreeing with him, at least in his attempted refutation of our main thesis. Perhaps in any follow-up he cares to write in response to our present rejoinder, he can further educate us in these matters of macroeconomics.

Let us begin our analysis with the very last sentence of Curott (2010, 70): "There is a market price for money, and it is determined by supply and demand." Well, if so, what then *is* the price for money? Is it 3.5 utils? Maybe it is one gold ounce? Or, perhaps, the price of money is the number 19.5, with no dimensions at all? Can the price of money be determined by a perusal of the statistical pages of the *Wall Street Journal*? If so, we beg to be directed by Curott to the exact amount of, well, of whatever, that constitutes. To be very succinct about this, we, the present authors, want to buy some "money," and want to know its price. In that way, we can determine if we can afford to purchase some money.

Now, of course, it would not be a proper answer on Curott's part to assert that the price of 1.00 USD is equivalent to 1.20 CAD, nor, yet, to 0.8 EUR. This sort of thing is well known. But note that these do not constitute "a market price" but rather *two market prices*, a distinction that does in fact encompass a fundamental difference. No, we seek something far different from this author: we ask that he make good on his claim that "There is a market price for money, and it is determined by supply and demand." It is all well and good to draw a supply and demand diagram on the blackboard,[1] to label the vertical axis "price of money,"[2] and the horizontal axis "quantity of money." Then to be sure, it cannot be denied, the supply and demand curve, if they are drawn upward and downward sloping, respectively, will meet *somewhere* in the upper right hand quadrant. Then, a line segment can be drawn from the intersection to the vertical axis, and—viola!—we will have generated a "price of money."

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[1]For a critique of supply and demand analysis, see Barnett and Block (2010).

[2]Or some variant thereof—e.g., for mainstreamers, "the" interest rate, i, or for orthodox Austrians, the "purchasing power of money" (PPM).

William Barnett II is Chase Bank Distinguished Professor of International Business and Professor of Economics, and Walter Block is Harold E. Wirth Eminent Scholar and Professor of Economics, both at the College of Business Administration, Loyola University, New Orleans.

But this sort of thing simply will not do, for it will leave undetermined the *dimensions*[3] of the so-called price of money. Unhappily, Curott vouchsafes us no specific answer to this vital question. It is to be hoped that in any follow-up article he writes on this subject, he will attempt to make good this oversight, even though this task is, literally, impossible in any meaningful sense. For as Mises (1998, 218, emphasis added) states: "The money equivalents as used in acting and in economic calculation are money prices, i.e., exchange ratios between money and other goods and services. *The prices are not measured in money; they consist in money.*" Now if a price is an amount of money and $1.00 exchanges for $1.00 at a bank, then the price of $1.00 is $1.00. As we usually quote prices in terms of x/y, i.e., $P_y = \$x/y$, then $P_\$ = \$1.00/\$1.00 = 1$, and therefore the price of money is one. But surely, this is not what Curott had in mind.

In contrast, were anyone to ask us, we would be happy to supply any number of prices for common, ordinary goods and services. For example, the price of a McDonald's hamburger ranges from $2-$5; a decent pair of shoes can be had for $100; the price of mowing an ordinary sized back yard is about $20. All Curott need do, to convince us of the error of our ways, would be to offer us *the* price of money, along these lines.

Curott states[4]: "The premise that money does not have a price expressible in units of some other single commodity

is of course true. But it does not follow from this premise that money has no single price. The argument is a non-sequitur" (pp. 67-68). Curott, here, could be taken to mean that in fact money has no single price, but that we did not make the case therefor; i.e., we were inept, but someone else could make the case in a satisfactory way. This obviously is not what he intends. The only other meaning is that money does have a single price, but as it is not "in units of some other single commodity," it must be in units of multiple commodities taken as a group. But this raises the aggregation problem, i.e., that of making incommensurables commensurable, an impossibility. In fact, what Curott has in mind is that the price of money is the reciprocal of the price of some specific basket of goods, X ($\omega_i x_i$, …, $\omega_n x_n$), where x_i is good i and ω_i is the weight assigned to x_i in the basket X. That is, if it takes $100 to purchase the basket X, the price of money is $P_M = 0.01X/\$1$. Of course, this could be expressed as an index number, but that is a trivial matter. Moreover, even in that case money has no single price (though its multiple prices would be different from the correct ones). That is, for each different set of weights there is a different P_M. Rothbard (2004, 237-38) states:

The purchasing power of the monetary unit consists of an array of all the particular goods-prices in the society in terms of the unit. It consists of a huge array of the type above: 1/5 horse per ounce; 20 barrels of fish per ounce; 16 dozen eggs per ounce; etc.[5]

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[3]For an essay that focuses attention on the importance of dimensions, see Barnett (2004).

[4]Hereafter, unless otherwise specified, page references are to Curott (2010).

[5]Rothbard adds to this statement the following footnote: "Many writers interpret the 'purchasing power of the monetary unit' as being some sort of 'price level,' a measurable entity consisting of some sort of average of 'all goods combined.' The major classical economists did not take this fallacious posi-

Further, Rothbard (2004, 238) refers to: "… the 'price' of money … ," specifically putting quotation marks around price. That was neither an accident nor a mistake. And, Rothbard (2004, 773) makes clear: "This purchasing power of money, as we shall see below, cannot be *measured*." So now, if we accept Curott's position, money has one price but it cannot be measured. There is one interesting price for you. The point is, a price that cannot be measured is not a price, because the essence of a price is a (measured) quantity of money itself. Or, to repeat, as Mises says: "*The prices are not measured in money; they consist in money*." But, money that cannot be measured cannot be money; it cannot serve the monetary function of facilitating trade, overcoming double coincidence of wants problems. Just image yourself, gentle reader, trying to buy something for, say $10, and handing over some "money" (that cannot be measured) to the vendor, and expecting him to give you change. The seller would look at you in bafflement; for sure, he would not turn any of his wares over to you.

Curott further states: "The price of all commodities, including money, may be expressed in terms of its exchange ratio against all other goods" (p. 68). That is simply incorrect. First, as a matter of English it is ambiguous at best, incoherent at worst. Consider the first part: "The

price of all commodities, including money …." Now, all commodities, including money, means the totality of commodities; i.e., it is all encompassing. Next, consider the second part: " … may be expressed in terms of its ratio against all other goods." But there cannot be an exchange ratio against all other goods, as there are not, nor can there be, *any* other goods. To put his statement a little more rigorously: "The (one) price of the set of all goods (including money) may be expressed as its (one) exchange ratio against the null set." Notice the clear use of the initial "The price" and subsequent "ratio" (not ratios) each meaning one. Notice also the initial use "all commodities, including money" and the subsequent use of "all other goods."

Could Curott have meant: "The price of each commodity [not, all commodities], including money, may be expressed in terms of its exchange ratio against all other goods"? But even that is incorrect.[6] For in a monetary economy the price of *each* good, *except* money, is expressed in terms of its *one* exchange ratio against money, not its exchange *ratios* against all other goods. It is only the *prices* of money that are expressed as exchange *ratios* against all other goods. Once he included money along with all other goods the meaning of the sentence became hopelessly confused, because *inter alia*, where prices are concerned, the positions of money, on the one hand, and that of all other goods, on the other, are totally inverted.

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tion: 'When they speak of the value of money or of the level of prices without explicit qualification, they mean the array of prices, of both commodities and services, in all its particularity and without conscious implication of any kind of statistical average' (Jacob Viner, *Studies in the Theory of International Trade* [New York: Harper & Bros., 1937], p. 314). Also cf. Joseph A. Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), p. 1094."

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[6]Curott's statement is correct in an economy of pure barter, with no one commodity serving in the monetary role, e.g., facilitating exchanges. But the system of pure barter is irrelevant to our present concerns, as we are now, perforce, discussing a *monetary* system.

Curott (p. 68, emphasis added) also states: "… *the* price of money itself is only expressible as the inverse of its exchange ratio in terms of *all of the other goods that it can purchase*."[7] But there is, at least in the real world, no "the price" of money and no "exchange ratio in terms of all other goods that it can purchase."[8]

But Curott (p. 68, emphasis added) then gives the game away: After noting that "… the price of money is only expressible as *the* inverse of its exchange *ratio* against all other goods … ," he adds: "This *inconvenience* has spurred statisticians to search for the construction of indices to express the purchasing power of money (PPM)." To describe statisticians' centuries-long efforts to develop *a* PPM as "an inconvenience" is euphemistic, at best. As Mises (1998, 224) has

noted, such efforts are doomed and useless as the only PPMs that are relevant are those appropriate for each individual decision maker.[9]

Curott then goes on to state that: "In the construction of any given index the relative weighting of any particular good is arbitrary. But the price that the index is constructed to measure is an objective exchange price determined by supply and demand" (p. 68). That is, any index of the PPM, the supposed price of money, is arbitrary or, to use a synonym, subjective. So, a subjective index is to be used to measure "the" objective exchange price?[10]

Moreover, if money has *a* price and if

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[7]Mises (1998 [1949], 427) states: "The money relation, i.e., the relation between demand for and supply of money, uniquely determines the price structure as far as the reciprocal exchange ratio between money and the vendible commodities and services is involved." This is the position held by Curott. But note that Mises also refers to "… the exchange ratio between money on the one hand and the vendible commodities and services on the other …." (401-02). That is, Mises makes the same mistake as Curott as there is in reality no single exchange rate between money and other goods. Apparently Mises commits this error because he wishes to make use of the concept of "the" purchasing power of money.

[8]Mises (1981 [1912], 216) states: "The objective exchange value of the monetary unit can be expressed in units of any individual commodity. Just as we are in the habit of speaking of a money price of the other exchangeable goods, so we may conversely speak of the commodity price of money, and have then as many expressions for the objective exchange value of money as there are commercial commodities exchanged for money."

[9]"The pretentious solemnity which statisticians and statistical bureaus display in computing indexes of purchasing power and cost of living is out of place. These index numbers are at best rather crude and inaccurate illustrations of changes which have occurred. In periods of slow alterations in the relation between the supply of and the demand for money they do not convey any information at all. In periods of inflation and consequently of sharp price changes they provide a rough image of events which every individual experiences in his daily life. A judicious housewife knows much more about price changes as far as they affect her own household than the statistical averages can tell. She has little use for computations disregarding changes both in quality and in the amount of goods which she is able or permitted to buy at the prices entering into the computation. If she 'measures' the changes for her personal appreciation by taking the prices of only two or three commodities as a yardstick, she is no less 'scientific' and no more arbitrary than the sophisticated mathematicians in choosing their methods for the manipulation of the data of the market" (Mises, 1998, 223-24).

[10]Mises (1981 [1912], 217-19) explains the problems with this.

that price is an objective exchange price, the question arises: Why do we need an index to express an objective price? If the price is truly objective an index is superfluous. Furthermore, our author speaks of the "search for indices." Either there is, as Curott maintains, one price for money or there is not; logic permits no other alternative. And if there is but one price of money why do we need multiple indices against which to measure it?[11]

Having thoroughly commented on these lacunae, let us now move to some other errors committed by Curott. He claims that "money becomes a price index" (p. 68). A price index is a normalized, weighted average of prices for some specific set of goods and/or services at a given time, in a given geographical area. In sharp contrast, money is not a weighted average of prices. Rather, it constitutes the wherewithal with which these items are purchased. Curott attributes to us the denial of the claim that "… the price that the index is constructed to measure is an objective exchange price determined by supply and demand" (p. 68). We have no quarrel with this particular statement, *provided* that the price referred to by Curott is the amount of money that was actually paid for the collection of goods that constitute the (weighted) items in the index. Or, if he meant *expected* price, then we would accept the price expected to actually be paid at some point in time in the future for the relevant basket of goods. But,

even if that is what Curott meant, that price is not "the" price of money, but rather "the" price of the relevant basket of goods. Suppose we call the basket of goods X, and the price paid for that basket at a particular point in time, t_0, was $100, then the price of X at t_0, $P_X(t_0)$ = $100/X. However, that does not mean that the price of the money at time t_0 was the reciprocal of the then current price of X; $P_M(t_0) \neq 1/(\$100/X) = X/\$100 = .01X/\$1$; i.e., the price of money was not one basket of goods per $100, nor, scaled down (if actually possible), one one-hundredth of a basket per $1. If so, there would be one price of money for every relevant basket; i.e., one for Curott and one for Block and one for Barnett and one for Mrs. Barnett (and on the last two Barnett can assure the reader from personal knowledge gained through hard experience that the relevant baskets for the latter two individuals are quite different).[12] Moreover, although we have called into question the legitimacy of supply and demand analysis *in toto* (Barnett and Block, 2010), assuming, *arguendo*, the legitimacy of this analytic tool, we have never denied that it established a single objective exchange ratio, or price, for each and every other good and service under the sun, *except* for money. As it happens, we support Curott's paean to Mises (1912) for explaining how objective prices arise on the basis of subjective considerations. Curott is to be congratulated for seeing this point so clearly.[13] But, we demur when he says that we cite this literature "disapprovingly" (p. 68).

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[11]Note that each such index does *not* provide the same information; in particular, over time the percentage changes in different indices will not, in general, be the same. That is to say, each different index will give a different result in that the percentage change that each will show over time is different. The conclusion to be drawn: Money has more than one price.

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[12]For one thing, the proportion of the index made up of books on macroeconomics would be very different.

[13]We also applaud Curott's splendid rendition of the monetary regression solution to the circularity problem in his Note 3.

Wherein do we say any such thing? Curott provides no answer.

Curott also avers that our analysis is "at odds with the modern subjective theory of the price determination of money—a theory which the entire economics profession has accepted since it was first developed by Ludwig von Mises" (p. 68). There are difficulties here. First, if by "entire economics profession" Curott means to include the small insignificant non-Austrian elements of it, i.e., mainstream practitioners, then it by no means follows that they have all "accepted … subjective theory." Hayek (1979, 52-53) famously said: "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." But this insight has not yet at all seeped out of the Austrian backwater and into the profession as a whole. Curott needs to peruse a few neo-classical microeconomics texts, the repository of their knowledge, and look at some of their cost curves. These are based not upon subjective opportunity or alternative costs, but rather on objective input considerations. Moreover, the mainstream avoids subjectivism even in the most fundamental of economic concepts: opportunity cost.[14] Typically, mainstream in-

termediate and advanced microeconomic texts start off by defining costs in a subjective manner, as the (subjective) value of options foregone. But in later chapters dealing with cost curves this insight is ignored or jettisoned.

We have reservations about Curott's "under a fiat system, the money supply … " (p. 69). Surely, a "supply" of something indicates quantities supplied under different price assumptions.[15] The supply curve of shoes, for example, is commonly generated by asking how much of this footwear will be forthcoming to the market at different hypothetical prices. But under our present monetary arrangements it is not at all clear what is meant by "the" supply of money. First, one must define money, and then identify the elements that satisfy that definition—a not so easy task. Having done so, one must determine who the suppliers are. In this regard, it is important to remember that "the" supply of money consists not only of the amount of the existing stock offered in exchange for various goods at various prices thereof, but also of the additions to the stock of money; i.e., "the" supply of new money. With regard to the latter, consider that most economists would include Federal Reserve Notes (FRNs), U.S. Treasury (UST) subsidiary coins,[16] and demand

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[14]For examples: Varian (2006, 23) states that: "… [opportunity] cost is measured by the slope of the budget line." Of course, anything that can be measured cannot be subjective and vice versa. Bernheim and Whinston (2008, 66, fn. 1) state: "However, we will typically reserve the term *opportunity cost* for implicit or hidden costs such as your lost pizza delivery income, and not direct out-of-pocket expenses." Here we have confusion between *objective* "implicit or hidden costs" and *subjective* costs. And, Nicholson (2005, 14) states: "So the *opportunity cost* of 1 unit

of clothing at point *A* is ½ pound of food." That hardly exhibits a thorough understanding of the subjective nature of cost.

[15]That is, we assume Curott uses "supply" in the technical sense and not as a synonym for "stock."

[16]Although the Fed buys notes from the UST for approximately four cents, it pays face value for coins. There is a reason for this. The UST "merely" acts as a commercial printer for the Fed, printing FRNs which it then sells to the Fed; i.e., they are Fed, not UST, notes (money). On the other hand, the

deposits (DDs) as part of the U.S. money stock.[17] Who then is the supplier of FRNs? The UST, that actually manufactures and then sells them to the Fed at total "cost"? But in that case the supply of FRNs is perfectly elastic. Or is it the Fed that sells FRNs to banks at face value, again a perfectly elastic supply? Or is it commercial banks that sell them at face value to depositors wishing to cash in their deposits? Again, a perfectly elastic supply? Or, is it the commercial banks in the cases (very limited) where commercial banks lend new money into existence and the borrowers wish to receive FRNs in exchange for the notes they issue to the banks in the process of borrowing the new money? What is the price of money in that case? Consider a figure illustrating the supply of money in that case. The quantity of money in the form of FRNs lent to borrowers would be measured along the horizontal axis. And what, pray tell, would be measured along the vertical axis as the price of money in this form? Consider, next, the creation of new money in the form of demand deposits (DDs) and the relevant figure. The quantity of money in the form of DDs lent to borrowers would be measured along the horizontal axis. And what, pray tell, would be measured along the vertical axis as the price of money in this form? Could the two figures be combined, so that the price as measured along the vertical axis is the same, and measured along the horizontal

axis would be the total of FRNs and DDs lent to borrowers? One would expect that in this (these) cases the price as measured along the vertical axis would be a nominal interest rate, but would not that rate vary among borrowers? (The present authors are not able to borrow at the prime rate.) Note that we have not even considered the Fed's supply of DDs to the UST in the UST's regular account, much less its supplemental financing account. Moreover, as the existence of over $1 trillion testifies, the Fed does not control the money stock, much less "the" money supply.

This brings us to a central point: if we are to speak of "the" price of money, then it must be a weighted average of *all* the things that money is used to buy. That is, if money has but one price it must be relevant for all non-money goods, not just a small, though important, subset. By far, the vast majority (by value as well as by number) of transactions in which money is exchanged for goods involves financial assets, including the exchange of new and pre-existing financial assets (debt, equities, and hybrids), as well as foreign currencies. But we find no mention of this in Curott.

Curott states: "Under a fiat system the money supply is primarily determined exogenously by the amount of base money supplied by the central bank" (p. 69). Because the monetary base is comprised of currency held by the public (i.e., outside of the Fed Banks and depository institutions) and reserves of depository institutions, this statement is patently incorrect and currently, excess reserves are approximately *15 times greater* than required reserves and comprise approximately one-half of the monetary base. Whereas on 5/1/1990, the ratio of M1 to the monetary base was approximately

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coins are UST coins so the UST mints them for itself, and then sells them to the Fed at face value, as they belong to the UST before the sale to the Fed.

[17]It is not necessary to consider whether other financial assets satisfy the chosen definition of money—the present authors choose "generally accepted media of exchange and means of final payment" to make our point re "the" supply of money.

2.9/1 and on 5/1/2000 it was approximately 1.9/1, as of 5/1/2010 it was 0.85; i.e., currently the monetary base is *greater than* the money supply as measured by M1.[18] It is obvious that our central bank, the Fed, does not control "the" money supply, even if it does control the monetary base.[19]

In Curott's next sally against us he says: "If it were suddenly revealed that market forces do not in fact determine the relative price of money in the economy, then honest economists would have to abandon much, if not most, of their theoretical and applied analysis" (p. 69). Now, admittedly, this sounds horrible. Every fiber of being of a free market economist must bridle at the thought "that market forces do not in fact determine …" well, *everything*.[20] But a moment's thought will disabuse us of this notion. There are indeed phenomena in the face of which "market forces" are powerless. For example, market forces cannot create a square circle. Why not? Because the very concept is a logical contradiction. Nor can "market forces" call forth a pink elephant, or a unicorn. And the reason? There are no such creatures. In like manner, "market forces," no matter how beloved of the free market Austrian econo-

mist, cannot generate a single price for money. However, we do unwaveringly maintain that market forces *do* determine the relative *prices* of money. So, Curott to the contrary notwithstanding, honest economists have nothing to fear from us—they don't "have to abandon much, if not most, of their theoretical and applied analysis" on our account.

Curott takes our position that there is no single price for money to mean that the concept of "the purchasing power of money" is meaningless. In a way, he is right. We do reject the concept of "the" purchasing power of money. However, that does not mean, as per Curott, that:

> Any attempt to make sense of the changes in the price of money as manifested in the observable phenomena of inflation and deflation would be unfounded and in vain. Nor would it be possible to assess whether changes in the supply or demand of money are relevant causal factors of macroeconomic fluctuations. Yet these are precisely the implications of the position advocated by Barnett and Block (pp. 69-70).

Rather, just as we know that there is no single price of money, so also do we know that there is no single purchasing power of money. That is, there are as many prices of money as there are goods and there are as many purchasing-powers-of-money as there are price indices. Thus, for consumer goods there is a group of price indices, e.g., the CPI and the PCE, both official indices calculated by the U.S. government. Then there is John Williams' Shadow Government Statistics (SGS) estimate. We wish Curott would make known to us which is the correct single PPM. But wait, aren't the Dow Jones Industrial Average (DJIA) and the S&P 500 also price indices? Don't they measure the PPM in terms of

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[18]The ratios for M2 for the same points in time display the same pattern: 11.6/1, 8.2/1, and 4.3/1.

[19]To appreciate the disconnect between the monetary base and the money supply, just check the following charts at the St. Louis Fed website: (1) http://research.stlouisfed.org/fred2/graph/?s%5b1%5d%5bid%5d=BOGAMBNS, and (2) http://research.stlouisfed.org/fred2/graph/?s%5b1%5d%5bid%5d=M1NS.

[20]How many free market economists does it take to change a light bulb? (None. They leave it to market forces.)

different weighted collections of stocks? In fact, the astute observer uses all of the information available to him that he thinks relevant when making decisions. Curott is largely correct when he states: "Any attempt to make sense of the changes in the price of money [*sic*] as manifested in the observable [price] phenomena of inflation and deflation would be unfounded and in vain" (pp. 69-70). The reason is that for an individual consumer, it is the specific prices of goods relevant to that individual that matter, not those of a group of goods many of which are of no concern to him. Moreover, it is incorrect to say that it would be impossible to judge whether changes in "the supply or demand of money are relevant causal factors of macroeconomic fluctuations" without having knowledge of "the" single PPM. Knowledge of the stock of money and supplies of new money serve very well, indeed. This is true, especially, when used in conjunction with specific knowledge of various price *indices* and indices of the production of various types of goods, including financial assets, indices of imports and exports, exchange rates, etc.

We end on the same note we began. If money does indeed have a "price," we then again ask Curott to tell us, precisely, what it is. That is, what, specifically, is the price of money? What was its price a day ago, a year in the past, at any time in the last decade? Indeed, we leave it to this author to determine the date and the place for which he will be acquainting us with the price of money. If he cannot do that—and so far not only has he not done so, he has not recognized the need to do so—his critique of our paper, worthwhile in many other ways for delving into this issue, cannot be considered to have refuted it.

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