The Emergence of Fiat Money: A Reconsideration

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One of the fundamental questions in monetary economics is why fiat money has value: Why do rational agents trade real resources for intrinsically worthless pieces of paper? Monetary economists have long understood that part of the explanation relates to the superiority of a monetary equilibrium over a barter one. However, it is one thing to explain why fiat money is *better* than barter, and quite another to explain how fiat money *actually emerges*. Recognizing this point, a number of recent studies (e.g., Kiyotaki and Wright 1991, 1992, 1993; Ritter 1995; and Williamson and Wright 1995)[1] have sought to explain the emergence of fiat money by means of a hypothetical direct jump from barter to a fiat money equilibrium.[2]

This paper suggests that these attempts are fundamentally misconceived. They suffer from three main problems. The first is the "start problem"[3]—that is, the difficulty of ensuring an *initial* demand for fiat money balances. If fiat money is ever to emerge from barter, someone must be the first to exchange real goods for pieces of paper money that, by definition, do not provide any direct consumption

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Cato Journal, Vol. 20, No. 3 (Winter 2001).

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[1]Some of the issues raised in this literature are also discussed by Goodhart (1997) and Selgin (1993, 1994, 1997).

[2]This research program implicitly assumes that agents act noncooperatively and decide independently of each other whether to accept intrinsically worthless assets from an initial barter equilibrium. This implies that there is no institutional mechanism to coordinate agents' move from barter to a fiat money equilibrium. If such a mechanism existed, we could easily explain the emergence of fiat money simply by invoking it to coordinate the move to a fiat money equilibrium. However, any such explanation is obviously spurious. We must therefore rule out such mechanisms if we are to provide a satisfactory explanation for the emergence of fiat money.

[3]I thank George Selgin for suggesting this terminology.

services to the holder.[4] The problem is that no agent will ever give up real goods for intrinsically worthless pieces of paper, *unless* he believes that others will accept them too, and an agent living in a barter economy has no reason to expect them to. Each agent would therefore refuse to accept fiat money, because he expects others to refuse it as well. People will not move away from barter equilibrium, precisely because it is an equilibrium.

Second, even if we could solve this first problem, there is the difficulty that agents generally face a choice of potential monetary objects, in which case we get a multiplicity of potential equilibria involving the use of any one or more of these objects as money.[5] The equilibrium that actually results will then depend on agents' expectations about the acceptability of different objects, and it is not easy, to say the least, to manipulate these expectations to produce any one particular equilibrium. It will be fortuitous if all agents happened to choose only one object, and even more fortuitous if they all chose government fiat money.

Finally, the predictions of these models are at odds with the historical evidence. Fiat money did not in fact evolve in the way these models postulate: nowhere did fiat money ever emerge by means of a great leap forward from barter. Nor did fiat monies ever emerge out of thin air. Instead, fiat monies have always developed out of some previously existing money. If we are to explain the emergence of fiat money, we must therefore explain how it emerges from previously existing money, not from barter.

The "Start Problem" in Recent Models of Fiat Money

The "start problem" is best illustrated using a simple version of the Kiyotaki-Wright model. Following Kiyotaki and Wright (1992: 19–

[4]This problem is quite different from and logically prior to the "terminal problem" that has traditionally preoccupied monetary economists (Gale 1992: 226). The latter problem relates to the point that people must have some confidence in the *future* value of money if money is to have a positive value *now* (Cass and Shell 1980: 252). Solving this terminal problem requires that we give a plausible reason to expect money to have a positive future value, but even if we solve this problem—and doing so is not easy (Faust (1989: 872, 879)—any explanation that says that fiat money has value now *because* it is expected to have value in the future begs the main issue (i.e., how fiat money gets accepted at all). The "start problem" is discussed further in Selgin (1993).

[5]Most authors respond to this problem by assuming that there is only one particular object that could satisfy a public demand for money, and then go on to identify this object with government-issued fiat money. However, such an assumption merely dodges the issue.

20), suppose there is a large number of agents who consume a fraction x of a large number of perfectly storable consumption goods. Each good is produced by a fraction x of agents, and agents do not consume the goods they themselves produce. In period 1, a fraction (1-M) of these agents is randomly endowed with consumption goods, and the rest with intrinsically worthless paper money. Each agent has one unit of a good or one unit of money. Agents meet bilaterally and at random each period, and trade only if it is in their mutual interest. An agent who consumes then immediately produces another good, so all agents always have either one unit of a good or one unit of money. An agent who accepts a good is assumed to incur a positive transaction cost, but one who accepts money incurs a transaction cost of zero. Each agent now chooses a trading strategy to maximize his expected utility net of production and transaction costs, and we seek Nash equilibria in which agents take each others' trading strategies as given. We also make the simplifying assumptions that all agents are identical and that all goods are equally acceptable in trade. It is then immediately apparent that an agent will only accept a good in exchange if he wishes to consume that particular good. There is no point incurring transactions costs to obtain a good that one does not wish to consume, and is no better for trading purposes than the good one already has. It also follows that trade will only take place if there is a double coincidence of wants, and a double coincidence of wants occurs with probability x^2. Barter thus involves fairly high search costs.

The next step is to see if we can induce any agent to accept money in exchange for real goods. If Π is the probability that a typical agent attaches to other agents accepting money from him, then Kiyotaki and Wright (1992: 20; 1993: 66–68) show that our typical agent will always accept money if $\Pi > x$, but always refuse it if $\Pi < x$. (The intuition is simple: given that our agent does not wish to consume fiat money, it only makes sense to accept it if it is more acceptable to others than the good he already has, i.e., if $\Pi > x$.) Hence, the decision whether to accept money depends on Π, the probability of other agents accepting money from him. The equilibrium consequently depends on expectations. If a typical agent expects a sufficiently large number of others to accept money, he will accept it himself, and we will get a monetary equilibrium in which everyone accepts money. But if our agent believes that an insufficient number of other people will accept money, he will refuse it himself, in which case no one accepts it and we get a nonmonetary equilibrium (i.e., barter). Expectations about the acceptance of money have a self-fulfilling character.

As an aside, the monetary equilibrium also has the property that it

relieves agents of dependence upon a double coincidence of wants and thereby produces a considerable increase in the efficiency of exchange. An agent who accepts money in a monetary equilibrium can expect to obtain the good(s) he wants next period with probability x, rather than the probability x^2 he faces under barter. The agents involved would clearly prefer the monetary equilibrium to the non-monetary one.

Nonetheless, there is a very awkward corollary: *If agents start from barter, they have no way to get to the monetary equilibrium*. The reasoning is simple: In a barter equilibrium agents do not expect each other to accept fiat money, so $\Pi = 0$; yet one or more agents must be willing to accept fiat money in exchange for goods if the economy is ever to move from barter, and we already know that an agent will only accept fiat money if $\Pi > x$. However, the conditions $\Pi = 0$ and $\Pi > x$ cannot be simultaneously satisfied for any positive value of x. Hence, the economy can *never* move from the barter equilibrium to the monetary one. The economy remains stuck in barter, and it would remain stuck even if the agents involved all recognized that they would be better off in the monetary equilibrium. They remain stuck because they are effectively prisoners of barter expectations: They *would* accept money *if* their expectations of each others' willingness to accept money could be shifted, *but* it is not individually rational to accept money because there is no way to change those expectations. The fiat money is stuck at its launching pad (Selgin 1994: 809–11; Dowd 1996: chap. 10).

This example illustrates very clearly that we must do more than merely demonstrate that the monetary equilibrium exists and involves higher utility than barter, if we wish to show that the economy will reach a monetary equilibrium in which fiat money has a positive value.[6] The monetary equilibrium can exist and have higher utility than barter, and yet the economy can still remain stuck in barter. If the economy is ever to get out of barter, we must *also* demonstrate that one or more agents living in barter will at some point have a private incentive to accept money, that is, we must overcome the start problem. Unfortunately, this problem cannot be overcome because the attempt to do so involves a contradiction: agents will only accept

[6]Iwai (1988: 1–3) also recognizes the implications of the bootstrap nature of the monetary equilibrium. As he puts it, "any student of the speculative philosophy knows [that] there is a wide gap between the potentiality and the actuality, and, however tempting it is, we cannot immediately jump from [a] proposition about the potential ubiquity of money to the assertion that 'therefore, money evolves naturally in any economy.' The *logic* of money should not be confused with the *genesis* of money" (emphasis added).

fiat money if they think that a sufficient number of other agents will accept it, and yet the very fact that they are starting in barter equilibrium implies that they do *not* expect others to accept it.[7]

Which Money Will Agents Choose?

There is another problem. Even if we can explain why agents might start accepting intrinsically worthless monetary objects in a state of barter, we must also explain why their demand for such objects translates into a demand to hold government fiat money. A priori, there is no reason to suppose that they have only one possible object to choose from, or to suppose that all such agents would choose the same asset. Moreover, even if they did choose the same object, there is no reason to suppose that it would be government fiat money.[8]

To see what is involved, suppose there are only two possible fiat monies, a green one and a blue one. We can assume that the government prefers the greenback, but the two monies are otherwise the same. Each agent now has to decide which money to accept, or whether to accept both, and we get a variety of possible equilibrium outcomes (Matsuyama, Kiyotaki, and Matsui 1993).[9] One outcome arises where each agent happens to think that the greenback will be acceptable, but the blueback will not be. The resulting equilibrium is then one in which the greenback is accepted as money and the blueback is not. This is the outcome that is normally assumed to occur when the demand for money is presumed to translate into a demand for government fiat money. However, there is also an equilibrium outcome in which the blueback is accepted as money and the green-

[7]This criticism also applies to Ritter (1995), despite his claim to model the emergence of fiat money. While Ritter *talks* of the emergence of fiat money, his *analysis* only addresses the question of whether a monetary equilibrium exists, and he provides no analysis at all of how the economy actually reaches this equilibrium starting from a state of barter. Ritter thus falls foul of the same start problem that affects the rest of this literature.

[8]One standard response is to assume that agents select as their fiat money an asset in limited natural supply, such as cowry shells. However, this response begs the point and fails to explain why agents use cowry shells instead of available alternatives such as snail shells. It also ignores the point that cowry shells were never adopted as some equivalent to fiat money. They were valued first as ornaments, and then adopted for monetary purposes. The fact that most modern economists have little use for cowry shell ornaments should not blind us to the fact that cowry shells were an example of commodity money.

[9]Matsuyama, Kiyotaki, and Matsui (1993) use a version of the Kiyotaki-Wright model to examine which fiat money is used, in a framework in which each region has its own currency, and find that there is a variety of possible equilibria depending on agents' (self-fulfilling) expectations about the acceptability of the two currencies. Kiyotaki and Wright (1993: 74-75) also have a model in which either or both monies could circulate, but explicitly examine only the dual-currency equilibrium.

back is rejected, as well as a dual-currency equilibrium in which both green and blue monies circulate as currency. It would therefore be fortuitous if agents happened to converge on one single money, and even more fortuitous if they happened to converge on the government's preferred money, assuming, of course, that they were free to choose. Instead, the natural outcome is a dual-currency equilibrium in which both green and blue assets circulate as money. The odds against any one single-currency equilibrium also rise with the number of choices that agents have. If agents have a choice of n assets, we get possible equilibria in which any of the n assets, or any combination of the n assets, circulate as money. The odds in favor of multiple-currency equilibria therefore rise with the number of potential monetary assets.[10]

The outcome depends on agents' expectations, and yet there is no obvious way in which expectations can be coordinated to ensure that any particular outcome actually results. In practice, governments can, and do, attempt to promote their preferred money in various ways.

First, the government might attempt to promote its preferred money by announcing that it will only deal in that particular money (e.g., when trading on its own account). However, unless the government is very large relative to the rest of the economy (in which case the probability of a private trader meeting a government trader is very high), this measure will not generally suffice to ensure that private agents accept only the government's preferred money. The government might *encourage* the adoption of the green currency, but it cannot guarantee that *only* the green money will be adopted.

Second, the government could promote its preferred money by announcing that it will deal in that currency alone when collecting taxes. However, making a particular money uniquely acceptable for tax payments does not in itself enhance its acceptability for nontax transactions: the link between acceptability for tax purposes and commercial acceptability still remains to be established. In any case, there is also the problem that no centralized agency with tax-collection powers actually exists in the Kiyotaki-Wright type of model environment, and it is difficult to see how one could be introduced without

[10]This poses a serious problem, because multiple-currency equilibria are the exception rather than the rule historically. Most of the time most historical agents made use of one particular currency, and it was generally efficient that they did so (e.g., because of lower accounting costs). Where agents did use multiple currencies, there also tended to be observable reasons for doing so (e.g., traders might operate both locally and internationally, and use different currencies for each type of trade).

undermining the noncooperative framework within which agents are presumed to operate.

Finally, the government might seek to promote its favored money by imposing legal restrictions against the use of alternatives. Perhaps the most obvious means of enforcing legal restrictions in the assumed model environment is for the government to send out enforcement agents disguised as legitimate traders and give these agents powers to punish those agents who offer them trades involving blue money (e.g., by confiscating their holdings). More fundamentally, the argument that the government could use its powers to promote its favored money also fails to address the question of what powers the government might have in the Kiyotaki-Wright world. If all agents are decentralized traders, then who or what is the government and where do its powers come from? This problem is usually ignored in this literature. The only exception seems to be Ritter (1995) and his attempts to deal with it merely highlight the problems involved. In his model, the issuer of money is assumed to have monopoly access to a technology that enables member-agents to costlessly coordinate with each other, and the monopoly itself is simply taken for granted. However, his optimum is then one in which all agents become members of the issuing coalition (Ritter 1995: 145). All agents therefore have implicit access to a costless coordination technology, and Ritter fails to explain how this technology fits alongside the assumed lack of coordination that gives rise to the use of money in the first place.[11]

Historical Evidence

Recent literature on the emergence of fiat money is also historically falsified. The historical experience indicates that fiat money actually emerged from previously convertible currency, and did not emerge directly from barter. The convertible currency itself arose from a commodity currency, which in turn arose from barter.[12] The process therefore began with the emergence of commodity money from barter. In time, the commodity exchange medium gave way to a convertible paper currency that displaced commodity money as the dominant medium of exchange. The paper currency was anchored to the

[11]In any case, unless the government resorts to draconian punishments, we still cannot rule out a blue-money or mixed-money equilibrium in which agents regard the threat of punishment as a form of taxation they must live with (Kiyotaki and Wright 1993: 74–75). Again, the government lacks the power to ensure that only its preferred asset is chosen as money.

[12]The main points summarized here can all be verified by consulting any of the standard histories of early money and banking (e.g., Carlisle 1901, Burns 1927, and Quiggin 1963).

value of the earlier commodity money by virtue of the issuers' commitment to redeem it on demand and, while banks economized on the reserves held to redeem their currency issues, there is no evidence of any natural market tendency toward a displacement of the convertibility guarantee as such.[13] However, governments then started to intervene to suspend the convertibility guarantee—for example, the British government did so in 1797 and the U.S. government in 1861, both times prompted by the fiscal exigencies of war. The suspensions were meant to be temporary and convertibility was subsequently restored, but after alternating periods of convertibility and temporary government-imposed suspension, convertibility was finally suspended in the early 1970s with no pretense of any intention to restore it. Today the major currencies of the world have became true fiat currencies with no link at all to any commodity anchor.

Nor have fiat monies ever emerged *de novo*, by fiat command or by other means. Selgin (1994) reviews the experience of a variety of new fiat currencies starting from John Law's fiat currency in the early 18th century, and could not find a single case where a fiat currency had been successfully launched *de novo* without first tying it in to some *existing* currency or currency unit:

> The [new currency] units (or fractional counterparts) had in every case been in use to some extent in the marketplace prior to the reforms embodying them in new currencies. The units' definitions had, moreover, to be rendered operational through some kind of convertibility, typically involving one or more fixed or nearly fixed exchange rates to foreign monies. Legal tender and public receivability provisions were, on the other hand, either nonexistent or of obviously secondary importance. Experience therefore supports the conclusion . . . that *a new fiat money must be operationally linked to some established money if it is to achieve a positive value* [Selgin 1994: 823, emphasis added].

[13]Inconvertible currency did not therefore emerge spontaneously from previously convertible currency, as suggested by McCallum's comment that "since it is costly for banks to maintain the requisite commodity reserves and since the convertibility option is very rarely exercised, banks might eventually do away with this guarantee" (McCallum 1985: 29) as if it served no particular purpose. He went on to suggest that the abolition of convertibility by the Bank of England in 1797 might be an example of such a process. However this example does *not* bear out this interpretation. Far from being the outcome of a spontaneous market process, the suspension of 1797 is a classic example of the government intervention mentioned in the text. The British government had already borrowed more from the Bank than the Bank directors wanted, and a point came when a relatively minor shock set off a run that the Bank did not have the resources to meet. The government then intervened to prohibit the Bank from making further specie payments. The role of the government in this suspension could hardly be more clear-cut.

Conclusion

The essential problem with the recent literature is that it attempts to tell an impossible story: it attempts to explain how fiat money can emerge directly from barter. The response is that fiat money *cannot* emerge directly from barter—and, as a matter of historical fact, *did not* do so. Of course, no one is denying the fact that we all now use fiat money, but any explanation for the use of fiat money must be consistent with the historical evidence. I would therefore suggest that the correct story is that barter gives rise to commodity money, commodity money then gives way to convertible paper currency, and the currency subsequently remains convertible for as long as competitive forces are allowed to maintain convertibility. The reason is that convertibility offers the public a guarantee of the value of the money they use. The public values this guarantee, and so competitive pressures force the banks of issue to maintain it (Dowd 1996: chap.1). Convertibility then ends when the government intervenes to suppress convertibility. Only at that point does the currency become a genuine fiat currency—a currency of a type made possible only by the *fiat* power of the state. Any sensible story about the emergence of fiat money must therefore come to terms with two fundamental facts, both of which are ignored by recent literature that attempts to explain the emergence of fiat money by means of a great leap forward from a barter to a fiat monetary equilibrium: the fact that fiat currencies always arose out of previously convertible currencies, and the fact that fiat currencies always arose from subsequent state intervention to make those currencies inconvertible.

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