

## Response to 1<sup>st</sup> referee's report (received December 29<sup>th</sup> 2009) on "[Solving the Paradox of Monetary Profits](#)"

I thank the referee for his comments. It appears from these that I have delved into the technical details of the model too rapidly for readers who are not deeply familiar with the methods of differential equations, since several of his/her criticisms appear to reflect unfamiliarity with these (this especially applies to points 3 and 4).

One major motivation for developing the technology for building systems of coupled ordinary differential equations (ODEs) that I discuss on pages 11-12 was to enable economists who are unfamiliar with ODEs to nonetheless be able to follow a model that employed them.

However, having tried to reduce the apparent complexity of the presentation, it may be that I have glossed over technical points that non-experts in dynamic modeling still need to know in order to follow such modeling. I will revise the paper to try to strike a better balance between simplicity and depth of exposition.

On some other points it appears that the referee would prefer if the paper were on a different topic—the logical foundations of the Circuit approach to money, rather than the development of a viable economic model based on the Circuit approach to money. I will modify the paper to make it clear that I am not considering the former issue.

### ***Point 1: a prior logical definition of money***

The referee states that “monetary-circuit authors following Graziani have been unable to date to explain the purchasing power of money logically” and asserts that “The first logical task of any monetary economics theory, indeed, would be to explain logically the nature of money and its purchasing power”.

I instead accept as a starting point Graziani's insight that a credit economy is distinguished from a barter economy by the fact that the transfer of an intrinsically worthless token (be it paper money or an entry in an electronic database) is accepted as full payment for a commodity.

Graziani can certainly be described as simply assuming this purchasing power in the relevant paper<sup>1</sup> (Graziani 1989). However were I to attempt what the referee suggests and logically prove why money has purchasing power, I would be submitting an entirely different paper, which would address an entirely different issue.

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<sup>1</sup> “In order for money to exist, three basic conditions must be met:

a) money has to be a *token currency* (otherwise it would give rise to barter and not to monetary exchanges);

b) money has to be accepted *as a means of final settlement* of the transaction (otherwise it would be credit and not money);

c) money must not grant privileges of seignorage to any agent making a payment.

The only way to satisfy those three conditions is to have payments made by means of *promises of a third agent*, the typical third agent being nowadays a bank...”

I instead chose to assume that money has purchasing power, and then describe the monetary dynamics of a pure credit economy. As an analogy, this is similar to what Newton did to derive the equations for the law of universal gravitation, without first explaining what gravity actually is. 300 years later we are no closer to explaining what gravity is, but Newton's equations certainly expanded our knowledge of the universe.

I therefore believe that I am justified in starting from Graziani's assumption of the purchasing power of money and then showing the dynamics of the system which results from it. I would prefer to leave the logical issue the referee raises to other authors, like (Rossi 2007) whose work the referee cites.<sup>2</sup>

### ***Point 2: relationship between credit and money***

This comment may reflect an ambiguous statement of terms, which I will clarify in a revision. I state that "the topic of the creation of fiat money (and the relationship between credit and fiat money) [has to be left] to a later paper."

It appears that the referee interpreted me as meaning that I was separating the issue of money from the issue of credit, which is not the case. Instead, I have constructed a model of a pure credit-money economy in this paper, leaving the issue of a mixed credit-money-fiat-money model for a later paper.

### ***Point 3: timing of creation of money***

Here some confusion is arising over the nature of dynamic modeling and the informal way I chose to present this very formal topic, given the general lack of awareness of differential equations amongst economists. The amount of  $\$A$  in the  $F_L$  and  $F_D$  accounts and zero in the  $W_D$  and  $H_I$  accounts is a set of initial conditions for a system of differential equations. It describes the existing situation at a time which is arbitrarily chosen as the starting point of a model, and which reflects the preceding history of the system.

I chose to use that as a starting point of the model, but I could equally have chosen to start the system at a point where the equilibrium distribution applied (as shown in equation 1). That would have produced rather less interesting graphs of simply horizontal lines.

The referee states that:

"The circular flow between the banking sector and any given firm  $F$  is pointless, unless a payment has to be made in favour of another agent, say wage earners."

Payments are in fact occurring right at the start of this model, and in fact wage payments are higher with the initial conditions I chose than they would be with the equilibrium conditions, since wage payments per annum depend on the balance in the  $F_D$  account. These start at \$280 p.a. with the initial conditions in my simulation (since  $w=2.8$

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<sup>2</sup> On this point, I note that Rossi published an earlier paper by me on a related topic: (Keen, S. (2009). The dynamics of the monetary circuit. The Political Economy of Monetary Circuits: Tradition and Change. S. Rossi and J.-F. Ponsot. London, Palgrave Macmillan: 161-187.), and this issue was not raised in that editing process.

and the balance in FD starts at \$100), and fall to \$242.555 p.a. when equilibrium levels are reached as shown in Table 3. I have included a graph of this in the revised derivations document that accompanies this reply.

#### ***Point 4: discussion of equilibrium conditions***

Here again I may have provided too brief an explanation of what I am attempting with this paper. There is a widespread belief within Circuit theory that maintaining a *constant* level of output requires an *increasing* level of money and debt over time. Consider for example this passage from Graziani:

If on the other hand, wage-earners decide to keep part of their savings in the form of liquid balances (that is, banking deposits), firms will get back from the market less money than they have initially injected in it. In the terminology of circuit theory, there has been a loss in the circuit and firms will be unable to repay to the banks the whole of their debt. (Graziani 1989, pp. 5-6)

In my paper I show that this beliefs is false, and based on the confusion of the stock of money in existence ( $\$A$  in my model) with the amount of turnover that stock can generate per year ( $F_D/\tau_S$  in my model, where this is a function of  $\$A$  and other factors). Showing that a non-zero amount in the  $W_D$  account is quite compatible with firms being able to repay their debts is thus a major contribution to the literature.

However I need to state this point more clearly, since it does not appear to be obvious given how the paper is currently written.

#### ***Point 5: flow and stock issues***

I take the referee's point here that "The flow and stock dimensions of money or monetary magnitudes ought to be spelt out more clearly", and will do so in a rewrite.

The other proposition under this point relate to whether the repayment of debt destroys money. This is an issue on which I disagree with standard practice amongst Circuit theorists, but where there is also ambiguity in Keynes's beliefs. It may be better if I rewrite the paper to avoid this topic, since it is a classic case where "more heat than light" can be generated.

#### ***Point 6: relation to the GFC***

The referee is correct that there is no *direct* link between this paper and the GFC. On this point I was accepting the proposition in (Bruun and Heyn-Johnsen 2009) that "The Paradox of Monetary Profits" is "An Obstacle to Understanding Financial and Economic Crisis". As they put it, "To investigate possible macroeconomic effects and causalities between the two economic spheres of capitalism we have to locate the joints"; my paper does just that. Again however I should be more explicit about this in a revised paper.

Bruun, C. and C. Heyn-Johnsen (2009). "The Paradox of Monetary Profits: An Obstacle to Understanding Financial and Economic Crisis?" Economics(Managing Financial Instability in Capitalist Economies): 25.

- Graziani, A. (1989). "The Theory of the Monetary Circuit." Thames Papers in Political Economy **Spring**: 1-26.
- Keen, S. (2009). The dynamics of the monetary circuit. The Political Economy of Monetary Circuits: Tradition and Change. S. Rossi and J.-F. Ponsot. London, Palgrave Macmillan: 161-187.
- Rossi, S. (2007). Money and payments in theory and practice. London, Routledge.