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An Inconsistency in Using Stock Flow Consistency in Modelling the Monetary Profit Paradox

Marcel R. de la Fonteijne

Abstract
In order to understand the sources of profits or monetary profits of capitalists and firms, the author examines the phrase of Marx: 'Die Gesamtklasse der Kapitalisten kann nichts aus der Zirkulation herausziehen, was nicht vorher hineingeworfen war.' (The class of capitalists cannot extract from the circulation what has not previously been thrown in.) Steve Keen studied the monetary paradox and contrary to circuitists he came to the conclusion that capitalists can make a monetary profit with the possibility to earn enough to repay their debt, with positive balances for all actors. The author demonstrates that Keen made a fundamental mistake and is using the Stock Flow Consistency Principle in an inconsistent way by combining it with behavioral equations in a dynamic model. The solution presented here shows not only problems with the numbers but with the method. This solution resolves a dispute between Keen and circuitists and implies that, in a Wicksellian pure credit economy, it remains impossible for all actors to gain a monetary profit.

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Keywords Monetary profit paradox; stock flow consistency; circuit theory; endogenous money; Wicksellian pure credit economy

Authors
Marcel R. de la Fonteijne, ✉ Managing Director at DLF Sustainable, Delft, The Netherlands, marcel@dlfsustainable.nl

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1 Introduction

In its most simple form the monetary profit paradox is described as:

A capitalist can put workers to work against wages W. The workers buy the consumer good from the capitalist for $C=W$. And then the question arises how can the capitalist make a profit from it.

For an extensive historical overview on this topic see Tomasson and Bezemer (2010).

In Keen (2010a) the author tried to solve the monetary paradox too and came, in contrary to circuitists, to the conclusion that capitalists can make monetary profit with a possibility to earn enough to repay the debt and with positive balances for all actors. I will prove that Keen made a fundamental mistake and is using the Stock Flow Consistency Principle in an inconsistent way by combining it with behavior equations in a dynamic model. The solution presented here is not only showing that the numbers are incorrect but the method itself. This resolves a contraction between Keen and circuitists and implies that, in a Wicksellian pure credit economy, it remains impossible to gain a monetary profit for all actors.

In Keen (2010b) the numbers are different but the fundamental mistake is still there.

2 Analysis

I will follow Keen's reasoning step by step and show where his mistake took place. First Keen is building a small closed economy with workers, a firm and a bank. For the definition of the terms used I like to refer to de la Fonteijne (2013). Then Keen is adding a bank because the argument is that with fiat money each transaction is in principle a tripartite action between buyer, bank and seller. And another argument is that with a bank there is interest involved.

This process results in a stock flow table as Godley (2007) is producing in his Stock Flow Consistency (SFC) approach with corresponding differential equations as behavior functions.

The model begins with the banking sector extending a loan A to the firm sector; this initializes the system by creating A of credit money stored in the F_D account, for which there is a matching record of debt in F_L.

The minimum set of flows that this creation of credit money sets in train is (also see Table 1):

1. Accrual of interest (A) compounds the outstanding debt in F_L at the rate (r_L) specified in the loan contract;
2. Assuming that the firm sector meets its debt-servicing obligations in full, a flow of money (also A) from F_D to B_I offsets the compounding of debt in the first operation;
3. A flow of money (B) from B_I to F_D pays the firm sector interest on its deposits at the rate r_D a lower rate than that charged on debt;
4. A flow of money (C) from F_D to W_D pays wages to workers (who are then employed in factories to produce output for sale);
5. A flow of money (D) from B_I to W_D pays workers interest on their bank balances; and
6. A flow of money (E and F) from both B_I and W_D goes to F_D to pay for the output from the factories owned by the firm sector.

Because F_L is not changing I left it out of the table, so in fact it is a revolving loan.

Firms Deposit F_D	Worker Deposit W_D	Bank Income B_I	
$-A$		$+A$	0
$+B$		$-B$	0
$-D$	$+C$		0
	$+D$	$-D$	0
$+E+F$	$-F$	$-F$	0
0	0	0	0

Table 1: Godley table: Flow of funds in initial system

These conditions can be specified more precisely by making simple constant parameter substitutions and introducing the following behavior:

1. $A = r_L \Lambda$ is the loan rate of interest r_L times the amount outstanding in the loan account F_L.
2. $B = r_D F_D$ is the deposit rate of interest r_D times the balance in F_D.
3. $w F_D$ is a factor w of the current balance in F_D.
4. $D = r_D W_D$ is the deposit rate of interest times the balance in W_D and
5. $E = \omega W_D$ *and* $F = \beta B_I$ will be some factor (say ω and β respectively) of the balances in the accounts W_D and B_I.

Now we can solve for the equilibrium levels of these accounts, which will give us the conditions for F_D, W_D and B_I. Note that one of these three equations is redundant due to Walras law (Godley, 2007).

So solving these equations needs another not mentioned equation. Keen is using

$$B_I = \Lambda - F_D - W_D.$$

Because of his choice in using a part of the bank balance this is not a very beautiful solution but not wrong either.

In the example we use Λ =100, r_L = .05, r_D = .01, w = 2.8, ω = 26, s = .3 and β=1. In equilibrium the solution is shown in Tables 2 and 3.

	Workers	Firms	Banks	
A		–5	5	0
B		0.866269503	–0.86627	0
C	242.5555	–242.5554608		0
D	0.093326		–0.09333	0
E	–242.649	242.6487873		0
F		4.04040404	–4.0404	0
	0	0	0	0

Table 2: Godley table: Equilibrium value of initial system

	Balance	Initial	Monetary Profit
F_D	86.62695	100	–13.373
W_D	9.332646	0	9.332646
B_I	4.040404	0	4.040404
	100	100	0.00

Table 3: Equilibrium balance and profit values

So far so good.

Now comes the tricky part. Keen is changing to a complete new problem by introducing a new equation for mark-up. He is therefore introducing the following equation:

$$w = \frac{1-s}{\tau_s}$$

Aggregate wages are therefore

$$W = \frac{1-s}{\tau_s} F_D$$

Since national income resolves itself into wages and profits Keen argues (interest income is a deduction from other income sources), we have also identified that gross profit Π equals

$$\Pi = \frac{s}{\tau_s} F_D$$

and *GDP* Y equals

$$Y = \frac{F_D}{\tau_s}$$

The problem is that this additional equation

$$w = \frac{1-s}{\tau_s}$$

is resulting in a strong interdependence of the equations and parameters used. So once you choose τ_s, with given w, than s can be calculated.

As an example Keen let s = 0.3 and τ_s = 0.25. Together with the calculated equilibrium value F_D this leads to the result shown in Table 4. E and F are the

value of the sold product of the firm and this has to add up to GDP *Y*. The other approach is production costs plus mark-up which is of course also equal to GDP *Y*.

That leaves us with the question why $E + F$ is not equal to Y if we are talking about the same system and again this is because the system has changed and is over-determined which leads to a contradiction. The system is no longer SFC.

Fortunately we can avoid this inconsistency by calculating s= 0.012506, in which case we are at a new equilibrium with a stabilized monetary loss of –16.70 and a net profit of zero (see Table 5).

So it is not possible to repay in this case the initial loan in no matter how many years.

	Keen		Equilibrium
Wages	242.5555		242.5555
Profit	103.9523		4.13373
Y	346.5078	*E*+*F*	246.6892

Table 4: Conflicting equilibrium balance values

	Balance	Initial	Monetary Profit
F_D	83.29966	100	–16.7003
W_D	12.65993	0	12.65993
B_I	4.040404	0	4.040404
	100	100	0.00

Table 5: Equilibrium balance and profit values for s=.012506

3 Conclusion: The Proposed Solution and Conclusion Are Wrong

- From a mathematical point of view, because the introduction of the new formulas makes the system inconsistent except for s=.012506
- From a fundamental point of view, because in a closed system the total of the financial assets cannot change, so $\Delta F_D+\Delta W_D+\Delta B_I=0$ (de la Fonteijne, 2013), which also applies to a Wicksellian pure credit economy.
- From a sustainable and philosophical point of view, because otherwise Keen would have created a monetary money making machine with unlimited capacity, which can be considered as a perpetuum mobile.
- From an economical point of view, because you cannot increase Y as you please and because of the strange choice of modelling behavior on the opposite extreme of what Godley (2007) is using throughout his book.

For the reader who is interested in the unravelling of the monetary profit paradox I like to refer to my paper 'The Monetary Profit Paradox and a Sustainable Economy: A Fundamental Approach' (de la Fonteijne, 2013).

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