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Thomas I. Palley

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Aggregate demand, endogenous money, and debt: a Keynesian critique of Keen and an alternative theoretical framework

Thomas I. Palley
Independent Analyst
Washington, DC
Mail@thomaspalley.com

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Abstract

This paper presents a Keynesian critique of Steve Keen's treatment of the endogenous money – credit – aggregate demand (AD) nexus. It argues his analytic intuition is correct but is developed in the wrong direction. Keen's fundamental relation describing determination of AD in an endogenous credit money economy suffers from two flaws. First, it neglects the core Keynesian problematic of leakages from and injections into the circular flow of income. Second, it falls into the theoretical morass regarding the black box of velocity of money via its adoption of a form of Fisher equation to determine AD. The paper contrasts Keen's treatment with a Keynesian structural framework.

Keywords: endogenous money, credit, aggregate money, velocity of money.

JEL references: E00, E10, E12, E20, E40

1. Right intuition, wrong direction

Steve Keen (2014a) has written a paper further exploring the link between aggregate demand, endogenous money, and inside debt. I welcome his continued engagement with this subject. Given his presence on the internet, this important issue in monetary macroeconomics stands to get much increased visibility.

His paper covers similar terrain as two papers of mine dating back to 1994 and 1997 (Palley, 1994, 1997). In those papers I showed that consumer credit can be an engine of the business cycle and can generate business cycle instability. My 1997 paper also showed direct credit (bond market or loanable funds lending) is less expansionary than indirect credit (endogenous money bank lending) provided through the banking system via the creation of inside money. Unfortunately, it was published in a mainstream

journal which meant it was not read by mainstream economists who were (and still are) uninterested in the issues, and neither was it seen by Keynesian and Post Keynesian economists.

While I welcome Keen's engagement with the subject, I also believe his treatment is flawed. His analytic intuition is absolutely correct but he has developed it in the wrong direction. The basic problem is an inadequate macroeconomic theory of aggregate demand (AD). The rest of this paper provides a critique of his treatment, followed by presentation of an alternative theoretical framework for analyzing the aggregate demand - credit - endogenous money nexus.

2. Steve Keen as Post Keynesian monetarist?

In a precursor paper to the current paper, Keen (2009) described the fundamental relation linking aggregate demand, credit, and endogenous money as follows:

> "In fact, we live in a fundamentally monetary credit-based economy, and in such an economy, aggregate demand is equal to the sum of income plus the change in debt (Keen, 2009, p.1)."

This relation can be expressed as

(1) $E_t = Y_t + \Delta D_t$

E = nominal aggregate demand, Y nominal income, ΔD = change in the level of inside (private) debt. The subscript t refers to the current time period.

In the current paper (Keen, 2014a) that fundamental relation has been restated as:

> "The starting point of the monetary macroeconomics of endogenous money is instead that effective demand is equal to income plus the turnover of new debt (Keen, 2014a, p.1)."

This relation can be expressed as

(2) $E_t = Y_{t-1} + v_t\Delta D_t$

v = velocity of money. And in a subsequent paper (Keen, 2014b) it has been further restated as:

> "The correct proposition is that, in a world in which the banking sector endogenously creates new money by creating new loans, aggregate demand in a given period is the sum of aggregate demand at the beginning of that period plus the change in debt over the period multiplied by the velocity of money (Keen, 2014b, p.14)"

This newest relation can be stated as

(3) $E_t = E_{t-1} + v_t \Delta D_t$

All three relations are fundamentally problematic from a Keynesian standpoint. Moreover, as argued below, relations (2) and (3) deepen the problem by introducing the faulty monetarist construct of velocity. For current purposes, the rest of the discussion will focus on equation (2) which is the relation Keen (2014a) presents in this symposium.

The central analytic problematic in the Keynesian theory of aggregate demand is that of injections into and leakages from the circular flow of income. The problem with Keen's treatment (in all three instances) is that it completely overlooks this and has nothing to say about it.

Equation (2) has nothing to say about the leakage – injection problematic and simply asserts this period's aggregate demand is equal to last period's income plus a change in debt effect. There is no explanation why last period's patterns of spending and saving simply carry over.

The Keynesian goods market closure is given by

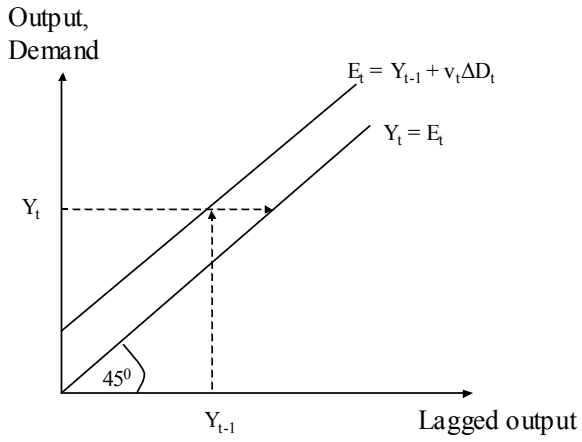
(4) $Y_t = E_t$

Substituting this relation in equation (2) then yields an expression for income given by

(5) $Y_t = Y_{t-1} + v_t \Delta D_t$

This equation is represented on Figure 1. Given last period's income plus this period's new borrowing effect, AD exceeds last period's income and output rises. If borrowing falls back to zero next period, the economy stays put at the new higher level of income. If borrowing turns negative (i.e. there is loan repayment) next period, economic activity retreats back down again. Changes in income are therefore driven exclusively by borrowing and loan repayment.

Figure 1. A graphical representation of Keen's proposed theory of AD and output determination.



The assumption that only borrowing and loan repayment can change AD is implausible. Households and firms can change their propensities to spend without borrowing or repaying loans. A central insight of Keynesian economics concerns the role of money which can act as a sink for purchasing power. Spending can be reduced by adding to idle balances, and it can be increased by activating existing idle balances. In the US, firms currently hold massive cash hoards. Those hoards can be activated to finance investment spending that increases AD. Export levels can change, and households and firms may also change the composition of their spending between domestic output and imports. Changes in the distribution of income, at both the functional and personal levels,

can affect AD because of different propensities to spend out of income among agents. All of these changes can be accomplished independently of new borrowing or debt repayment. Moreover, borrowing in prior periods creates debt service transfers from debtors to creditors and these transfers will affect the pattern of leakages to the extent debtors and creditors have different propensities to save. Given all of that, there is no reason why this period's aggregate demand should equal last period's income or last period's aggregate demand.

A second feature of equation (2) is that there is just one form of debt. However, in reality there are many types of debt. These types include debt incurred by households to finance consumption, debt incurred by firms to finance investment, and debt incurred by households and firms to finance asset acquisitions. There is no reason to believe that these types of debt have the same impact on AD.

In principle, the model can be adjusted so that equation (1) has n types of borrowing with a different velocity of money attached to each type of debt, as follows:

(6) $E_t = Y_{t-1} + v_{1,t}\Delta D_{1,t} + \ldots + v_{n,t}\Delta D_{n,t}$

However, that raises problems regarding the velocity of money in their model. Money is fungible and is pooled in the banking system, so why would the velocity of money differ across debt types? This issue is discussed further below.

The theory of endogenous money connects debt to the money stock. The simplest formulation is an economy in which all lending is done by banks, banks have no equity, and banks hold no assets except loans. In this case the inside money stock is equal to the level of bank lending so that

(7) $M_t = D_t$

M = inside money stock. Increases in bank lending increase the money stock, and decreases in bank lending (i.e. loan repayments) reduce the money stock. That implies:

(8) $\Delta M_t = \Delta D_t$

Substituting equation (8) in equation (2) yields

(9) $E_t = Y_{t-1} + v_t \Delta M_t$

AD is equal to last period's demand plus the change in money stock multiplied by this period's velocity of money. Iterated substitution in equation (9) then yields:

(10) $E_t = Y_{t-\alpha} + \sum_{i=1}^{\alpha} v_{t-i} \Delta M_{t-i}$

AD is equal to income at the beginning of time plus the sum of past changes in the money stock multiplied by the time dated velocity of money.

Equation (10) has a strong resemblance to the Fisher equation used by monetarists, which prompts the notion of Keen as Post Keynesian monetarist. The Fisher equation of exchange is given by

(11) $M_t v_t = Y_t = P_t y_t$

P = price level, y = real output. The Fisher equation of exchange is often interpreted in terms of the Cambridge money demand equation given by

(12) $M_t/P_t = y_t/v_t = k_t y_t \qquad k_t = 1/v_t$

However, I have argued (Palley, 1993, p.74-75) that Fisher equation of exchange should be interpreted as a monetarist theory of aggregate nominal demand which is equal to aggregate nominal supply. From a monetarist perspective, money circulates as spending and the amount of spending therefore depends on the velocity of circulation which determines the frequency of circulation so that

(13) $E_t = v_t M_t$

The reduced form of Keen's fundamental equation of aggregate nominal demand is given by equation (10) and it has clear similarities with equation (13). Thus, suppose infinitely far distant past nominal income is assumed to be zero ($Y_{t-\alpha} = 0$) and velocity is assumed to impact existing money balances equally regardless of creation date. In this case, equation (10) becomes

$$(14)\ E_t = v_t \sum_{i=1}^{\alpha} \Delta M_{t-i} = v_t M_t$$

In equation (14) velocity is not constant and varies across time periods. However, at any moment in time velocity operates equally on all existing money balances regardless of the date when created, which makes sense given the fungibility of money.

Keen's monetarist treatment of aggregate nominal demand is similar to Moore's (1994) theory of aggregate nominal demand and critique of the Keynesian expenditure multiplier. Moore endorses the Fisher equation as a theory of aggregate nominal demand, and he only differs from Monetarists regarding the theory of money supply. Viewed in that light, Moore and Keen represent a form of Post Keynesian monetarism that accepts the Fisher equation as a theory of aggregate nominal demand but rejects the monetarist approach to the money supply.

Adoption of the monetarist Fisher equation framework makes the velocity of money central, but the velocity of money has always been a "black box". Empirically, velocity is a generated variable that is obtained from the ratio of nominal GNP to the money supply. That raises the question of which money supply, and there is also the issue of how to treat non-GDP transactions (intermediate transactions). Multiple velocities can be generated, which begs the question of what is the relevant velocity for Post Keynesian monetarists.

At the level of theory, what determines velocity? Milton Friedman (1956) interpreted velocity in terms of the theory of money demand, so that velocity was the ratio of nominal GDP to nominal money demand. Post Keynesian monetarists seem to interpret velocity in terms of a nominal credit expenditure multiplier. It is the addition to aggregate nominal demand resulting from an additional dollar of credit. Since output equals aggregate nominal demand, the nominal credit expenditure multiplier is given by

$dY_t/d\Delta D_t = v_t$

Moreover, the spending persists in future periods as long as loans are not repaid.

Unfortunately, this interpretation of velocity as a black box credit expenditure multiplier just kicks the can down the road. First, what is the microeconomic explanation of v, and what variables is v functionally determined by?

Second, the coefficient v determines the impact of credit on AD and it presumably varies by type of credit. For instance, consumer credit is likely to have a larger impact on aggregate nominal demand than credit for purchases of existing assets. Why is that so and what variables determine the difference?

Third, if velocity varies by credit, how does v relate to money since money is fungible? A dollar created by consumer lending is identical to a dollar created by lending to purchase assets. That creates a contradiction as the velocity of money would differ from velocity in an equation with multiple types of credit (such as equation (6)).

Fourth, what determines how aggregate demand is split between consumption spending (durables, non-durables, services, etc), exports and imports, and investment (business structures, residential, plant and equipment, etc.)?

To summarize, Keen's fundamental relation describing the determination of AD in an endogenous credit money economy, given by equation (2), suffers from two critical flaws. First, it neglects the Keynesian problematic of leakages from and injections into the circular flow of income with its assumption that last period's AD carries over fully to this period's AD. Second, it falls into the theoretical morass regarding the velocity of money via its adoption of a form of Fisher equation to determine AD.

3. An alternative Keynesian framework

The Fisher equation constitutes the monetarist framework for macroeconomics. Income-expenditure accounting constitutes the Keynesian framework and it offers an alternative approach to understanding the AD, credit, endogenous money nexus. The key difference is that instead of viewing the impact of credit through the lens of velocity, the impact of credit is seen through the marginal propensity to spend from credit.

This approach to credit is illustrated by Palley (1997) who presents a business cycle model in which there is both direct credit (i.e. loanable funds credit provided via the bond market) and indirect credit (i.e. endogenous money credit provided via the banking system. A loanable funds construction of the credit process involves transferring existing money balances between lenders and creditors. An endogenous money construction of the credit process involves the creation of new money balances. Consequently, endogenous money lending has a larger effect on AD because there is no need for lenders to forgo spending.

The model is a business cycle model organized around a reduced form equation for output that is a second-order difference equation. However, rather than present the

full model with its cyclical complexities, a simplified abbreviated version that suppresses the dynamics is presented below.

The equations of the simplified model are given by:

(15) $Y_t = E_t$

(16) $E_t = C_{1,t} + C_{2,t}$

(17) $C_{1,t} = zY_{t-1} - S_t + \Delta D_{1,t} + \Delta D_{2,t}$ $\quad 0 < z < 1$

(18) $C_{2,t} = a_0 + a_1\{[1-z]Y_{t-1} + S_t - \Delta D_{2,t}\} + a_2 W$

$a_0 > 0,\ 0 < a_1 < 1,\ a_2 < 0,\ [1-z]Y_{t-1} + S_t - \Delta D_{2,t} > 0$

(19) $\Delta D_{1,t} = D_{1,t} - D_{1,t-1}$

(20) $\Delta D_{2,t} = D_{2,t} - D_{2,t-1}$

(21) $S_t = i_1 D_{1,t-1} + i_2 D_{2,t-1}$

(22) $M_t = D_{1,t}$

(23) $W_t = M_t + D_{2,t}$

Y = level of output, C_1 = consumption of debtor households, C_2 = consumption of creditor households, a_0 = autonomous consumption spending of creditor households, a_1 = propensity to consume of creditor households, a_2 = creditor propensity to consume out of wealth, z = share of income received by debtor households, ΔD_1 = change in bank debt (indirect finance), ΔD_2 = change in credit market debt (direct finance), S = level of interest service payments on total debt, D_1 = level of bank debt, D_2 = level of credit market debt, i_1 = interest rate on direct credit, i_2 = interest rate on direct credit, M = bank money supply, W = real wealth.

Equation (15) is the goods market closure which has output equal to AD. Equation (16) is the definition of AD which consists of consumption by debtor

households and consumption by creditor households. Equation (17) determines debtor household consumption. Their consumption is equal to their share of income (zY) minus debt service plus borrowing via direct (bank) and indirect (bond) channels. Debtors have no saving so all assets are held by creditor households. Equation (18) determines creditor household consumption. Creditors consume a fraction of their share of income plus interest service income received. However, their income is reduced by lending via direct (loanable funds) credit markets. There is also a positive wealth effect on consumption. Equations (19) and (20) track the stocks of indirect and direct debt which are driven by borrowing and loan repayment. Equation (21) determines interest service payments on existing debt. It is assumed banks pay all interest to their owners and banks therefore have zero operating costs. Equation (22) determines the bank money stock as equal to the level of bank lending in accordance with the theory of endogenous money. Equation (23) defines creditor wealth as equal to money holdings plus direct lending to debtor households.[1]

The model given by equations (15) – (23) is the simplest possible description of the goods market and AD. It is not intended to be a reflection of reality, but rather to show how credit and endogenous money impact AD. A fuller model of the economy would require adding a government sector, a business sector, open economy concerns, and closing the financial sector so as to determine interest rates. All of that is beyond the scope of the current short paper which describes the basics of a Keynesian approach to the AD, credit, endogenous money nexus.

[1] In principle, wealth could also include the stock market value of banks which would be equal to the stock market's valuation of bank profits.

The key feature of the model is the distinction between bank borrowing (ΔD_1) and credit market borrowing (ΔD_2). Bank borrowing and credit market borrowing have the same impact on spending of borrowers, but they have differential impacts on the spending of creditors, reflecting the nature of endogenous money. Endogenous credit money allows banks to lend without affecting the consumption of their owners since bank lending creates new money. This contrasts with finance provided directly through credit markets, which involves the transfer of existing income from lenders to borrowers.

Appropriate substitution of equations into equation (16) then yields the following reduced form for AD given by:

(24) $E_t = a_0 + b_1 Y_{t-1} + \Delta D_{1,t} + [1 - a_1]\Delta D_{2,t} + b_2[i_1 D_{1,t-1} + i_2 D_{2,t-1}] + a_2[M_t + D_{2,t}]$

$b_1 = \{z + a_1[1 - z]\}$ and $b_2 = [a_1 - 1] < 0$. AD is positively impacted by autonomous spending, consumption spending out of income, spending financed by bank borrowing, and spending financed by direct borrowing. If debtor households repay loans ($\Delta D_{1,t} < 0$, $\Delta D_{2,t} < 0$), as in a deleveraging environment, then loan repayment reduces AD. The impact of bank lending on AD is unity, whereas the impact of direct lending is $0 < [1 - a_1] < 1$. The greater impact of bank lending reflects issues discussed above. Direct lending transfers income claims from creditors to debtors so that the net increase in AD is equal to the difference in the propensities to consume of debtors and creditors ($[1-a_2]\Delta D_{2,t}$). Interest service payments on debt transfer income from higher marginal propensity to consume (MPC) debtor households to lower MPC creditor households, and therefore reduce AD. The marginal impact is equal to the difference in MPCs ($b_2 = [a_1 - 1] < 0$). Higher loan interest rates increase the burden of interest service payments and

lower AD. Lastly, increases in lending increase creditor household wealth which generates a positive wealth effect.

The above formulation of AD in an economy with credit and endogenous money can be compared with the Keen's model given by equation (2). The Keen model fails to address the Keynesian problematic of leakages and injections of AD into the circular flow of income, relies on the monetarist black box of the velocity of money to explain the impact of borrowing, and ignores debt burden effects that arise from borrowing. It also has no way of explaining the different components of AD and GDP.

In contrast, equation (24) addresses these issues. The leakage – injection problematic is addressed via consumption behavior and autonomous spending. It can be further refined by expanding the model to include a business sector, foreign trade, and a government sector.[2] The AD impact of borrowing is analyzed behaviorally and structurally in terms of propensities to spend out of borrowing and the impact of lending on creditor spending. The AD effects of debt created by borrowing are accounted for via the impact of interest service payments on spending, plus the wealth effects that result from the creation of financial liabilities which are always mirrored by a matching financial asset.

4. Conclusion

Steve Keen's engagement with the connections between endogenous money, credit, and aggregate demand is welcome. However, in my view, his theoretical treatment of the issue is flawed. His framing of the aggregate demand - endogenous money nexus in terms of the monetarist black box of velocity risks a wrong turn that threatens to set back

[2] Palley (2009, 2013, chap. 4) shows how borrowing by firms for purposes of financing investment spending can be incorporated, as can borrowing for asset purchases. The framework can also be applied in a growth theoretic context (Palley, 2010, 2013, chap 9).

Keynesian analysis of the issue. That would be a tragedy as Keynesians have been decades ahead of the mainstream in understanding endogenous money, credit, and their effects on AD.

In this paper I have focused on one of my own articles (Palley, 1997) because I know it best, it was published a while ago, and it is theoretically clear. Since then, the aggregate demand - credit - endogenous money nexus has been substantially incorporated in the well-known framework developed by Godley and Lavoie (2007). Zezza (2008) provides an early example of this, and Lavoie (2009) provides a concise review of the building blocks that go into this approach. That approach can be further elaborated to incorporate more finely the distinctions between bond market and bank credit, along the lines I have suggested.

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