

The return of black box economics - a critique of Keen on effective demand and changes in debt

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Abstract

In a paper for the *Review of Keynesian Economics*, Steve Keen has recently provided a restatement of his long-standing claim that 'effective demand equals income plus the change in debt'. The aim of this paper is to provide a detailed, step-by-step critique of Keen's argument using an analytical framework pioneered by Wolfgang Stützel which has recently been developed further. It will be shown that Keen's claims are based on an invalid generalisation of the contributions by Schumpeter and Minsky which he cites as antecedents to his argument. Effectively, Keen is attempting to derive macroeconomic outcomes from partial relations without paying due attention to the substantial qualifications necessary to make general statements on this basis. The equations he derives in doing so are only saved from being patently false through the introduction of an ill-defined 'velocity of debt' variable at the price of reducing their informational content to zero. His inclusion of the demand for financial assets in aggregate demand is based on rather arbitrary redefinitions which, while necessary for his argument, are hardly justifiable and call into question the actual purpose of his exercise. It will be shown that there is no necessary relationship whatsoever between the level of aggregate/effective demand and changes in the level of gross debt in the economy. This is not to say that absolute levels of debt are irrelevant, but rather that they can change for various reasons unrelated to the level of effective demand, including transactions that should properly be classified as purely financial ones. There is thus little insight to be gained in attempting to uniquely relate changes in gross debt to the level of effective demand.

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Introduction

Steve Keen certainly deserves a great amount of credit for the work he has done. His book *Debunking Economics* (2011) arguably still represents the most comprehensive and at the same time accessible critique of orthodox economics available. For many, including myself, reading that book was the first step in looking beyond the confines of mainstream theory. Since the start of the financial crisis, Keen has become one of the most prominent advocates of reform in economics teaching and research. As the new head of the School of Economics, History and Politics at Kingston University, he has pledged to further improve and transform the programme there along the lines also advocated by the international student movement.

In his research, he has been a persistent advocate of making a realistic treatment of money, debt and the financial sector an integral part of any macroeconomic analysis. He has increased awareness of the insights of thinkers such as Minsky and Schumpeter who for too long were neglected in teaching and research. Nevertheless, this article will present a critique of one of his original contributions which I believe to be misleading.

For a few years now, Keen has been promoting a view of the functioning of monetary economies that is conveniently boiled down in the claim that *aggregate/effective demand equals income plus the change in debt*. Keen has provided various statements of this argument at various degrees of refinement (see e.g. Keen (2011, p. 337 ff. & 2014a)). This paper will, however, focus on Keen's most recent formulation thereof in the *Review of Keynesian Economics* (Keen, 2014b) as part of a symposium on the matter. The aim of this paper is to provide a detailed critique of Keen's article.

An approach developed in a paper co-written by myself will be used as a starting point to critically examine Keen's claims. It will become clear that Keen's argument is questionable in many respects, including his interpretation of the antecedents cited and the weaknesses contained therein which he exports to his own work, his objectionable generalisation from partial to aggregate relations, his insufficient definitional clarity and rather arbitrary redefinition of terms, a lack of theoretical underpinning for his equations, and ultimately inadequate coherence as to the actual purpose of the exercise.

I will also refer to two critiques that have appeared alongside Keen's article in the aforementioned issue of the *Review of Keynesian Economics*, one by Palley (2014) and one by Lavoie (2014a). The kernel of the critique presented here is closest to that given by Lavoie, although I hope that this paper will serve to provide greater clarity on some points.

This paper is structured as follows: Section one summarises the main points of Keen's article and the critiques of Lavoie and Palley. Section two outlines the basic elements of the framework used to discuss Keen's argument, derived from Lindner & Reissl (forthcoming). Section three then examines Keen's argument to formulate a critique in terms of the framework previously developed. A final section summarises the findings and concludes.

1 Keen's argument

I begin this critique with a brief description of Keen's theory. Essentially, his argument can be summarised thusly: If there is a positive difference between the present period's (planned) aggregate expenditures on all types of newly produced goods and services and the previous period's realised aggregate income, this difference will have to be financed by an increase in debt. Aggregate/effective demand is then equal to the previous period's income plus the change in total debt multiplied by a velocity of circulation variable. Keen's theory can be neatly summed up in an equation used by both Lavoie (2014a, p. 322) and Palley (2014, p. 2) in their critiques:

$$(1) \quad AD = Y_{t-1} + v\Delta D$$

In addition, Keen divides the "debt" variable into different components according to the purpose for which the debt is incurred, each of which has a different velocity variable attached to it. In addition, Keen argues that since "monetary expenditure is on both goods and services and assets" (Keen, 2014b, p. 284), debt that is incurred to purchase financial assets must be included in the equation and hence be a part of effective demand. Keen cites both Schumpeter and Minsky as antecedents to his argument, quoting extensively from the work of the latter for this purpose. He provides a discussion of the velocity variable, a description of endogenous money creation, and a section in which he aims to show how his approach is consistent with what he views as the identity of expenditures and income. He concludes his argument by presenting some empirical data.

Before I begin my own critique of Keen's article, it appears appropriate to give a summary of the points from Palley's and Lavoie's critiques that seem to me the most important and substantive.

Palley (2014) notes that Keen's equation is deficient in that it assumes that agents always and invariably (plan to) have expenditures equal to the previous period's aggregate income (Y_{t-1}), unless there is a change in the amount of debt in the economy (i.e. a ΔD that is different from zero). As such, increases or decreases in the amount of debt become the sole factor driving changes in effective demand, to the exclusion of other typical Keynesian factors such as, for example, the distribution of income. Starting from this insight, Palley shows that under the assumption that all inside money is bank credit (ibid. p. 5), Keen's equation can be restated in a form almost equivalent to Fisher's equation of exchange. This raises the usual problems concerning the velocity of money variable.

Lavoie (2014a), makes an important point at the beginning of his paper which we shall return to in some detail below, stating if v in equation 1 is not treated as constant, then the equation becomes "a truism, a tautology, where v becomes identified after the fact, as a residual" (ibid. p. 323). Lavoie also notes that Keen performs a considerable leap from arguing (correctly) that changes in debt can have a considerable influence on aggregate

demand to claiming that aggregate demand equals income plus the change in debt. Indeed, it may be appropriate to view the mainstream position held by writers such as Krugman and Bernanke (see e.g. Bernanke, 2000), according to which the level of gross debt in the economy should be of no consequence whatsoever, which Keen rightly criticises in his work, and Keen’s own position in which there is a direct and immutable link between debt and aggregate income as two objectionable and extreme positions at opposite ends of a spectrum of theories.

The main objections I will raise in this critique are twofold and closely linked. Firstly, Keen’s entire argument suffers from a lack of definitional clarity which he partly exports from the work of Minsky, and it introduces a rather arbitrary redefinition of key terms. Once these issues are resolved, Keen’s reasoning is seen to be highly problematic. Secondly, his velocity of debt is a theoretically barren variable which, while necessary for the argument, is essentially left undetermined to pick up all the contingencies Keen ignores in his argument. Specifically, I will show that there is no necessary relationship of any sort between effective demand or aggregate income and changes in debt. I will also critically discuss Keen’s treatment of Schumpeter and Minsky and the empirical evidence he presents. The next section introduces the analytical framework I shall utilise throughout the paper.

2 Balance mechanics

The ‘balance mechanics’ method of analysis was devised by Wolfgang Stützel in his two major works (Stützel, 1978 & 1979) and bears clear resemblance to Godley’s sectoral balances approach (see e.g. Godley, 1999) as well as to SFC modelling (Godley & Lavoie 2012). The content of this section is an abbreviated version of section one in Lindner & Reissl (forthcoming), where the same framework was used to undertake a comprehensive examination of various macroeconomic paradoxes. The balance mechanics approach is characterised by two basic elements. The first consists of simple accounting relationships.

The balance sheet of any economic unit consists of its assets, its liabilities and its net worth, nw . Assets can be divided into tangible assets, ta , and *gross* financial assets, gfa . Liabilities, l , are debts and equity:

$$(2) \quad ta + gfa - l = nw$$

Net financial assets, nfa , are *gross* financial assets minus liabilities:

$$(3) \quad gfa - l = nfa$$

Gross financial assets can be further divided into means of payment m and all other financial assets, ofa :

$$(4) \quad gfa = m + ofa$$

As noted in Lindner & Reissl (forthcoming), the distinction between m and ofa will of course be context dependent and subject to constant change. The distinction nevertheless exists, however, and lies at the heart of any liquidity crisis.

A unit's net worth hence consists of the value of their *net* financial assets plus the value of their tangible assets. It changes if the sum of these values alters:

$$(5) \quad \Delta nw = \Delta ta + \Delta nfa$$

In the absence of asset price changes, nfa , ta and nw can only change as a result of changes in the respective quantities of financial assets and/or liabilities and/or tangible assets held¹. I shall call all such changes in quantities held 'transactions'. Of course, changes in prices are often associated with transactions, as when the price of an asset collapses due to widespread efforts to sell.

2.1 Flows

Three classes of flows have to be clearly defined and distinguished.

Income, y and consumption, c are flows that change a unit's net worth:

$$(6) \quad y - c = s = \Delta nw$$

Note that saving s here denotes the difference between all additions and all reductions in net worth during a period. Investment i (i.e. a change in tangible assets) is hence merely a subcategory of saving for any subset of economic actors.

Revenues, r , and expenditures, e are flows that change a unit's *net* financial assets:

$$(7) \quad r - e = \Delta nfa$$

This equation represents a unit's balance of payments, with the current account on the left hand side and the financial account on the right hand side².

¹Lindner & Reissl (forthcoming) provide a complete version of this framework incorporating asset price changes. Since this is not required for the argument presented here, I limit myself to an abbreviated and simpler version.

² nfa , as noted above, can also be altered by a change in the price of financial assets, from which I abstract here

Payments and receipts are flows that change a unit's stock of money/means of payment:

$$(8) \quad receipts - payments = \Delta m$$

It is important to make this distinction since the different terms are frequently used interchangeably while here each term carries a distinct meaning. It is possible, for example, for a transaction to give rise to income but no revenue, revenue but no receipt, or a receipt but no revenue. Lindner & Reissl (forthcoming) provide some examples for illustration.

2.2 Groups and the aggregate economy

The second basic element of balance mechanics is the division of the *aggregate* economy, that is, either a closed or the world economy, into a group and a complementary group. A group can be an individual, a sector, or any other genuine subset of economic agents as required for the problem at hand. Once a group is defined, its complementary group is the rest of the aggregate economy. It is then possible to formulate sets of statements about relations between groups, complementary groups, and the aggregate economy derived from accounting relations.

Partial statements are statements valid for groups, while statements valid for the aggregate economy are *global statements*. The application of a partial statement to the aggregate economy is very often only possible through the addition of highly restrictive assumptions, or it is an outright fallacy of composition. *Relational statements* can be used to describe the behaviour of the complementary group that is required for a partial statement to be valid for the group considered. In this way, one can avoid the possible pitfalls of drawing conclusions about the aggregate economy from an examination of partial relationships. This approach can be illustrated by considering that, following the above equations, the (real) income during a period t of any *genuine subset* (i.e. group) of economic actors is given by:

$$(9) \quad \begin{aligned} y_t &= c_t + \Delta t a_t + \Delta n f a_t = \\ c_t + i_t + \Delta n f a_t &= c_t + \Delta n w_t \end{aligned}$$

For the aggregate economy, however, *realised* revenues and expenditures (but not necessarily payments and receipts) are of course always exactly equal³.

$$(10) \quad 0 = \sum_{j=1}^N (r_j - e_j) = R - E$$

³Throughout this paper, lower case symbols denote variables pertaining to genuine subsets of economic actors whilst upper case symbols denote variables pertaining to the aggregate economy.

Similarly, to every financial asset fa_k there is a corresponding liability l_k , so that the aggregate economy's net financial assets is always necessarily equal to zero⁴. Thus, while any group can save financially (*partial statement*) to the extent that its complementary group dissaves financially (*relational statement*), the aggregate economy *cannot* save financially (*global statement*), i.e. in the form of financial assets.

$$(11) \quad 0 = \sum_{k=1}^K (fa_k - l_k) = \sum_{k=1}^K (\Delta fa_k - \Delta l_k) = \sum_{j=1}^N \Delta nfa = FA - L = \Delta FA - \Delta L$$

Using our definition of income for subsets derived above (equation 9) and aggregating, the aggregate economy's income is equal to its production during the period under examination:

$$(12) \quad \begin{aligned} \sum y_t = Y_t &= \sum c_t + \sum i_t + \sum \Delta nfa_t = \\ C_t + I_t + 0 &= C_t + \Delta TA_t \end{aligned}$$

The above constitutes the basic elements of the balance mechanics framework. I will now begin with an examination of Professor Keen's article and develop the framework further as required for this purpose.

3 Critique of Keen's argument

Having described the basic analytical framework, I move on to a discussion of Keen's argument as presented in Keen (2014b).

Section 3.1 presents a critique of the theoretical part of Keen's paper. In a first step, I will note some general problems with the fashion in which Keen develops his equation, in particular with his discussion of the velocity of debt variable and his derivation of global relationships from partial relations. To demonstrate this, I will then further develop the analytical framework presented above and show that there is no necessary relationship whatsoever between the level of effective demand and aggregate income on the one hand, and changes in the aggregate level of debt on the other. Next, I shall examine Keen's contention that purchases of financial assets should be included in aggregate expenditures in light of the definitions presented above.

In Section 3.2, I examine Keen's treatment of the works by Schumpeter and Minsky which he cites and show that he displays a tendency to overinterpret both authors, and carries over the weaknesses of Minsky's argument into his own.

Section 3.3 contains a brief discussion of the empirical evidence Keen provides.

⁴Similarly, changes in the price index of financial assets do not alter aggregate income if a stock-flow consistent accounting method is used throughout (for a discussion see Lindner & Reissl (forthcoming))

3.1 Endogenous money and effective demand

Keen begins the substantive part of his argument by constructing a set of equations describing the consumption of workers, that of capitalists, and investment. The volume of each of these components of GDP is taken to be determined by the sum of the previous period's income (divided into wages, distributed profits, and retained profits) plus the "turnover" (Keen, 2014b, p. 277) of newly created debt. For instance, the consumption of workers is, according to Keen, equal to (the previous period's) wages plus the sum of newly created debt used for consumption expenditures times a turnover or velocity variable. Beyond the problem already noted by Palley (i.e. all sectors always spend the same amount unless debt changes), there is a more fundamental flaw to be found here. The velocity variables are introduced by Keen since after any sum borrowed is spent "it continues to circulate and therefore can be spent again at some rate δ " (ibid.).

Strangely, however, the means of payment corresponding to wages (as well as distributed profits and retained earnings) are apparently only spent once (since there is no velocity variable attached to them) and do not continue to circulate but rather remain idle wherever they end up until the end of the period. This is so since, according to Keen, changes in the velocity of *existing* money balances are a "second-order process" (ibid.) which can be assumed away. In what way this assumption is justified, that is, in what way newly created money balances are fundamentally different from existing ones, does not become clear. Even although Professor Keen claims in section 9 of his paper that the velocity of debt variable is in fact identical to the velocity of money⁵, the velocity of existing money balances is dropped from his equation (since, as set out above, changes in it are assumed away) whilst the velocity of newly created money balances (debt) is taken to determine changes in income.

His assumption thus enables Professor Keen to derive the proposition according to which any change in effective demand is equal to the "turnover of new debt" (ibid.). It is obvious, however, that the argument contains the same weakness as the contributions of Minsky upon which it is based (as I will show in section 3.2). Keen simply aggregates the 'budget constraints' of different sectors and applies the constraints which may apply to each subset of agents separately to the aggregate economy. Moreover, even after his exposition, the velocity of debt variable remains a slippery concept with little theoretical underpinning. This will be demonstrated in what follows.

3.1.1 Balance Mechanics and changes in gross debt

I shall now draw upon the accounting relationships developed above to show why Keen's equation (equation 1 above or any alternative specification of it appearing in Keen (2014b))

⁵Keen argues that this follows from endogenous money theory, according to which, allegedly, "the amount of money in an economy is the initial amount (created by fiat) plus the current level of debt (ibid. p. 283). Clearly, this is not quite correct, and endogenous money theory implies no such proposition. While it indeed argues that all money is debt, it *does not* argue that all debt is money, so that Keen's equality would not, in general, hold.

is problematic. While the introduction of the velocity variable often, but not always, saves the equation from being flatly false, it is also a theoretically empty concept which renders the entire argument devoid of informational content. If the value of the velocity variable can only be identified in a tautological, ex-post fashion, it is difficult to see what the purpose of the theory is supposed to be, since it then can be neither prediction nor the theoretically coherent explanation of observed phenomena. To illustrate the problematic nature of the velocity variable, I first extend the analytical framework presented in section 2. The content of this section is adapted from sections 1.4 and 2.5 of Lindner & Reissl (forthcoming).

Section 2 above introduced the division of the aggregate economy into a group and a complementary group. To analyse various phenomena pertaining to the relationship between a group, its complementary group, and the aggregate economy, one can utilise an excess notional demand/supply framework derived from the accounting relationships presented above. I shall now briefly present this framework which is inspired by Myrdal (see e.g. Myrdal (2005)) and Shackle's discussion of Keynesian 'kaldeido-statics' (Shackle, 1965).

Abstracting from taxes and transfers, revenues and expenditures consist of spending on goods and services (*including* the purchase and sale of pre-existing stocks of goods, that is, tangible assets, such as inventories or real estate), $p * q$, labour services, $w * emp$, as well interest payments on financial assets and liabilities, $int * fv$.

While *realised* aggregate expenditures are necessarily equal to *realised* aggregate revenues, planned aggregate expenditures can obviously differ from expected aggregate revenues. Letting R^{exp} and E^{pl} denote expected revenues and planned expenditures respectively, one can write:

$$\begin{aligned}
 R^{exp} - E^{pl} = & \\
 (13) \quad & P * (Q^s - Q^d) + W * (EMP^s - EMP^d) + \\
 & Int * (FV_{FA,t-1} - FV_{L,t-1}) + P_{TA} * (Q_{TA}^s - Q_{TA}^d) = \\
 & \Delta NFA^{pl/exp}
 \end{aligned}$$

The above equation shows aggregated planned/expected current account transactions. A similar equation can be formulated for financial account transactions. $\Delta NFA^{pl/exp}$ will be exactly equal to the *sum* of the planned/expected change in the stock of means of payment held and the difference between the planned/expected change in the quantity of other financial assets and liabilities.

$$(14) \quad \Delta NFA^{pl/exp} = \Delta M^{pl/exp} + \Delta OFA^{pl/exp} - \Delta L^{pl/exp}$$

Equation 14 contains all planned/expected financial account transactions, among them those financial account transactions needed to finance planned/expected current account transactions, surpluses and deficits. The excess notional demand functions in the financial and current account can then be combined as follows:

$$\begin{aligned}
 \Delta NFA^{pl/exp} &= R^{exp} - E^{pl} = \\
 (15) \quad &P * (Q^s - Q^d) + W * (EMP^s - EMP^d) + \\
 &Int * (FV_{FA,t-1} - FV_{L,t-1}) + P_{TA} * (Q_{TA}^s - Q_{TA}^d) = \\
 &\Delta M^{pl/exp} + \Delta OFA^{pl/exp} - \Delta L^{pl/exp}
 \end{aligned}$$

Note that while this equation applies to the aggregate economy, a similar one can be formulated for any group of economic units. However, while any group can actually realise, *ex-post*, a planned/ expected change in its net financial assets (partial statement), provided that the complementary group incurs an opposite change of equal absolute magnitude (relational statement), this is not the case for the aggregate economy (global statement). If the plans and expectations expressed in equation 15 are consistent with each other when aggregated, the economy is in a condition of what Stützel (1979) has termed 'circular flow equilibrium'.

This form of 'equilibrium', however, has little to do with the way the term is commonly used in marginalist economics and is more akin to Keynesian 'expectational equilibrium' (Shackle, 1965), which can prevail only as long as agents' expectations are congruent and stable (for a more detailed discussion, see Lindner & Reissl (forthcoming)).

Thus far 'pure' balance mechanics can take us. To analyse the various possible reactions to incongruities between plans/expectations, behavioural assumptions are required. Using this framework one can then examine, for instance, the movements of effective demand, aggregate income, and the aggregate level of debt in various possible scenarios as I shall do now.

One of the most important characteristics of money (means of payment m) from a balance mechanical perspective is that it is a medium allowing individuals or groups to run expenditure or revenue surpluses⁶. Consequently, if a group *plans* to make expenditures in excess of its expected revenues, and under the assumption that the amount of direct trade credit available is negligible, either existing stocks of money in the group's possession have to be earmarked for this purpose, or the group will have to go into debt to a third party to acquire the necessary m . For the purpose of illustrating the problem with Professor Keen's equation, we shall assume that our economy can be divided into two groups; one which holds an existing stock of means of payment sufficient to finance any planned expenditure

⁶Of course, it is not the only medium capable of so doing. One can also run an expenditure surplus if the counterparty/counterparties in the respective transaction(s) are prepared to grant some form of trade credit to the buyer, in which case one can run an expenditure surplus without the need for any means of payment at all, be it in the form of state money or third-party- (usually bank-) credit.

surpluses⁷, and one which, ex-ante, would have to borrow, say, from a banking sector which for this purpose can be part of either group to acquire m in order to finance any planned expenditure surpluses.

Consider a case in which one of the groups a) expects its revenues from the sale of currently produced goods and services during the period under examination to be constant relative to the previous period and b) plans to make expenditures on such goods and services in excess of these expected revenues and consequently also in excess of expenditures thereon realised during the previous period⁸. The other group plans expenditures equal to the previous period's revenues and expects its revenues to be constant relative to the previous period. Hence, for one group:

$$(16) \quad \begin{aligned} \Delta nfa^{pl/exp} &= r^{exp} - e^{pl} < 0 \\ &= \Delta m^{pl/exp} + \Delta ofa^{pl/exp} - \Delta l^{pl/exp} \end{aligned}$$

and for the other group:

$$(17) \quad \begin{aligned} \Delta nfa^{pl/exp} &= r^{exp} - e^{pl} = 0 \\ &= \Delta m^{pl/exp} + \Delta ofa^{pl/exp} - \Delta l^{pl/exp} \end{aligned}$$

This means that the aggregate economy plans to reduce its NFA by running an expenditure surplus.

$$(18) \quad \begin{aligned} \Delta NFA^{pl/exp} < 0 &= R^{exp} - E^{pl} = \\ &= \Delta M^{pl/exp} + \Delta OFA^{pl/exp} - \Delta L^{pl/exp} \end{aligned}$$

The aggregate economy thus plans a current account deficit. If the group holding means of payment is the one planning a current account deficit, it plans to finance this by reducing its stock of m . If the other group is the one planning to run a deficit, it plans a change in liabilities by the amount of borrowing expected to be required while the change in its stock of money arising therefrom, and the planned change for running its current account deficit cancel out.

As established above, the aggregate economy cannot realise a current account deficit and hence the *realised* ΔNFA must *always* be zero. While it is clear that the individual units'/groups' plans are incongruent in the aggregate (since $\Delta NFA^{pl/exp} \neq 0$), without

⁷In a fiat money system, there will of course be a stock of liabilities somewhere in the system that is exactly equal to this amount of m .

⁸It is necessary to focus on expenditures on and revenues from goods & services produced during the period under examination since we wish to examine links between changes in debt and aggregate income. *Aggregate* income would not arise, for instance, from sales of pre-existing goods (tangible assets). Thus, when we speak of expenditures, revenues, expenditure surpluses or revenue surpluses in this section, these terms should be taken to mean expenditures on/revenues from currently produced goods & services.

additional assumptions, the framework does not allow one to predict exactly what the consequences of this will be⁹. The framework does, however, give the possibility of examining various possible outcomes and their consequences for the aggregate level of gross debt. I shall consider two simple limiting cases for illustration.

Reverting back to the earlier division of the economy into two groups, call the one which has existing holdings of m *group one* and the other *group two*. Now consider the case in which group 1 successfully realises an expenditure surplus (both relative to current revenue and to previous expenditure), which implies that group 2 necessarily realises a revenue surplus of the exact same size:

$$(19) \quad \Delta nfa_1 = r_1 - e_1 < 0$$

$$(20) \quad \Delta nfa_2 = r_2 - e_2 > 0$$

$$(21) \quad |\Delta nfa_1| = |\Delta nfa_2|$$

Cet. par. group 1's nfa will fall by the amount of its expenditure surplus while group 2's nfa will increase by that amount. By assumption, group 1 finances its expenditure surplus by depleting its pre-existing stocks of m . Consequently, group 2 finds that its holdings of m have increased. The absolute amount of debt does not change as a consequence of the realised current account balances. In a demand-determined economy, aggregate revenues will increase, and so will aggregate income. At the same time, however, the level of gross debt has not changed relative to the previous period so that the ΔD term in equation 1 is zero. Hence, even if the velocity variable became arbitrarily large, Professor Keen's equation would show (wrongly) that aggregate income had not changed at all.

Quite apart from these considerations, debt could just as well decrease if group 2 uses the m to pay off any pre-existing debt that it might have, or if the m is transferred back to group 1 through some purely financial transaction (e.g. the sale of a financial asset, which of course is only possible if group 1 holds a suitable asset) and consequently used by that group to reduce any pre-existing debt that it might have. Debt could, of course, also *increase* for any reason other than the financing of current account deficits. All of these effects would be picked up by variations in Professor Keen's velocity variable (in the possible case where debt decreases but aggregate income rises, the velocity would even

⁹It should be stressed, however, that we can be absolutely certain that the *outcome*, whatever its form, will be congruent, even if *expectations* are not. This does not depend on any market mechanism.

have to become negative).

Another possible case is that in which it is group 2 that realises an expenditure surplus and a decrease in its *nfa*, that is, the precise opposite from the situation depicted in equations 19 to 21. By assumption, group two has to borrow from the banking sector (increase its liabilities *l*) to acquire the *m* necessary to finance its current account deficit. Group 1 sees an increase in its *nfa* and receives the *m* borrowed by group 2. If group 1 simply holds the additional money and no other transactions of any kind take place, our analysis ends here. In this case, the absolute level of debt has increased by an amount equal to group 2's expenditure surplus. In a demand determined economy, aggregate income will have increased as well. This result appears to be in line with Professor Keen's argument at first sight.

However, if group 1 uses all the acquired *m* to decrease its own debt (if it has any), overall debt will not change by the full amount of the expenditure surplus or even not at all. The same outcome will occur if the *m* is transferred back to group 2 in a purely financial transaction and then used by that group to pay off the debt just incurred. On the other hand, absolute levels of debt could also increase through financial transactions by a far greater magnitude than group 2's expenditure surplus while the changes in *nfa* for both groups remain the same. Again, all these possible contingencies would, if they obtained, be reflected in fluctuations of the velocity variable.

The above gave an idea of the large number of possible scenarios for the dynamics of debt and income. The conclusion to be drawn is that in the aggregate, changes in *absolute* levels of debt bear *no* necessary relationship whatsoever to the level of expenditures, revenues, aggregate/effective demand however defined, or income, not to speak of a stable one. This can also be seen by once again considering a version of the current account and financial account components of equation 15 which has been solved for $\Delta L^{pl/exp}$:

$$\begin{aligned}
 \Delta L^{pl/exp} = & \\
 (22) \quad & \Delta M^{pl/exp} + \Delta OFA^{pl/exp} - P * (Q^s - Q^d) - W * (EMP^s - EMP^d) \\
 & - Int * (FV_{FA,t-1} - FV_{L,t-1}) - P_{ta} * (Q_{ta}^s - Q_{ta}^d) - \Delta NFA^{pl/exp}
 \end{aligned}$$

The equation illustrates the point made above, namely that changes in gross debt can arise for a large number of reasons and are not necessarily related in any way to (planned) current account balances. All such variations in debt would have to be picked up by the velocity variable, but Professor Keen's paper contains no theory of how this variable is determined.

The difficulty is that in contrast to net debt, gross debt can technically always be reduced through an equal reduction of assets (although note the complications potentially arising from the paradox of liquidity (Lindner and Reissl, forthcoming)) and can also theoreti-

cally increase without bounds without directly affecting net debt. This means that the distinction between debt incurred for the purpose of making expenditures in excess of revenues and all other changes in debt is necessarily artificial and the magnitude of changes in debt/period is not sufficiently determined by the size of planned and/or realised expenditure surpluses. In this sense, debt is merely a residual¹⁰, and ex-post changes in the absolute level of debt allow no conclusions about the likely volume or growth of revenues, aggregate demand, or income, or even about who is running expenditure or revenue surpluses and to which extent.

To be clear, once more, this is not to imply that changes in debt cannot have an influence on aggregate income (I believe that it has been shown by both theory and historical experience that it can). Rather, what it implies is that a theoretically barren 'black box'-relation is unable to capture it other than in a tautological fashion. Professor Keen has demonstrated variously (using his programme 'Minsky', for instance), that it is perfectly possible to construct examples and simulations in which there is a direct and stable link between aggregate demand and debt. He does so again in his description of the mechanism of endogenous money creation in the paper presently being discussed, when he uses credit card debt as an example. However, I above contended that while changes in debt may well closely correspond to changes in effective demand and hence income, this is not necessarily so from a pure accounting, aggregate perspective. Keen appears to recognise this in section 10 of his paper, but attempts to navigate around the problem by a highly arbitrary redefinition of terms.

3.1.2 Keen's inclusion of 'speculation' in financial assets

I have shown in the previous section that it is not possible, a priori, to determine movements in the aggregate level of indebtedness from planned expenditures, particularly since, as has been noted, debt can change for a large variety of reasons beyond the purchase of goods and services (even if the velocity of existing money balances is indeed taken to be constant). Professor Keen appears to acknowledge this in section 10 of his paper when he writes that "by far the major use of credit creation today is to fund speculation in the FIRE sector" (Keen, 2014b, p. 284). He then, however, attempts to rectify this problem by claiming that a purchase (or sale) of financial assets should be classified as an expenditure (or revenue).

In the second section of this paper, I set out to define very carefully what is meant by the term 'expenditure', as distinct from 'payment' and 'consumption', namely that it is a transaction that alters the net financial assets of the unit undertaking it.

Keen's redefinition, then, would mean to effectively eliminate any distinction between financial assets on the one hand and non-financial assets, goods, and services on the other as the purchase or sale of either would have to be recorded as a current account transaction. In effect, there would no longer be any such thing as a financial asset in an accounting

¹⁰Which, of course, does not mean that debt levels cannot grow to excessive and dangerous levels.

sense. This appears to me a rather arbitrary and unjustified redefinition of terms particularly as it still does not establish any necessary link between changes in debt and changes in income. *Aggregate* income would still be equal to aggregate production and a change in the amount of financial assets outstanding, or in the number of purchases and sales of existing financial assets (whether or not for the purpose of 'speculation'), although under this redefinition giving rise to expenditures and revenues, would not *in an of itself* lead to a change in aggregate income. Professor Keen, however, appears to make precisely this claim, given that total expenditure is now taken to include 'expenditures' on (redefined) financial assets, but that this sum still appears to correspond to effective demand in that the total level of these expenditures is taken to determine aggregate income.

The root of this problem is an insufficient distinction between income and revenues, as becomes clear in section 12 of Keen's paper. All he really demonstrates here is that a debt-financed increase in (redefined) aggregate expenditure gives rise to an equal amount of (redefined) revenue, but again he provides no link to aggregate income. Indeed, it is claimed that the volume of expenditures per time period is *equal* to income during that time period, a proposition that is surely not generally true¹¹. For instance, in a hypothetical economy relying entirely on home production (i.e. units only produce for their own consumption and investment) aggregate income would differ from zero, since it would be equal to that economy's production whilst revenues/expenditures would be nil, given the assumed absence of any current account transactions. In a modern monetary production economy based on the division of labour, on the other hand, total gross expenditures and revenues recorded over a period would be expected to be substantially greater than aggregate income, given that the purchase and sale of, for example, intermediate goods also gives rise to expenditures and revenues. To give another example, the purchase and sale of a pre-existing tangible asset gives rise to an expenditure and a revenue but does not affect aggregate income, since the expenditure affects the buyer's income negatively to the same extent that the corresponding revenue affects positively the seller's income.

The section additionally throws up the question what Keen is in fact trying to do. Is he attempting to derive an accounting identity? If so, he is only able to do so via an arbitrary redefinition of terms and the introduction of an undefined velocity variable (and even then, as shown, his equation can run into difficulty). Or is he proposing a new theory of effective demand and its links to aggregate income? If so, he fails to provide any theoretical underpinning as to how his redefined total expenditures translate into changes in aggregate income. His equation is then at least as much of a black box as the equation of exchange - not (quite) wrong per se but almost completely devoid of informational content.

¹¹It should be noted, however, that this is a frequently made assumption and hence not exclusive to Keen's article.

3.2 Antecedents

At the beginning of his paper, Keen discusses the works of Schumpeter and Minsky which he views as antecedents to his argument. Since this takes up a substantial part of his argument, it appears appropriate to critically examine Keen's treatment of these authors.

3.2.1 The Schumpeter connection

Keen begins his article by citing Schumpeter's discussion of credit in *The Theory of Economic Development* (1934/2012). In the aforementioned work, Schumpeter highlights the central role of credit for the capitalist entrepreneur. For him, the function of enabling the entrepreneur to set up a business, that is - in Stützelian terms - of enabling him/her to run expenditure surpluses before production takes place, is the essence, the crucial characteristic that defines the concept of credit. In order to capture this essence, Schumpeter *explicitly* abstracts in his discussion from all other purposes for which credit might be created (ibid. p. 103). Keen does not appear to take this into account when quoting Schumpeter and interpreting him as saying that "Total demand in the economy was therefore the sum of demand from incomes earned by the sale of existing goods and services (...) plus this debt-financed expenditure by entrepreneurs." (Keen, 2014b, p. 272). Schumpeter says nothing that would justify this interpretation. Keen goes on to equate Schumpeter's expression "total credit" (Schumpeter, 1934/2012, p. 101) with "total demand" (Keen, 2014b, p. 272), while all Schumpeter sought to show in the section in question was that total credit granted to entrepreneurs could exceed the value of existing potential collateral. Schumpeter consistently stresses the importance of credit for the entrepreneur and economic growth and progress itself. However, he never makes the mistake of drawing conclusions from a partial statement - namely that a unit which does not hold a pre-existing stock of means of payment requires credit in order to run an expenditure surplus, or indeed to increase their expenditures at all relative to the previous period, all other things, particularly receipts, being equal - about the aggregate economy in the form of trying to relate the amount of credit granted for whatever purpose to the level of effective demand. Keen, as I have argued, does precisely this with his equations - a fact that is obscured by his introduction of an ill-defined velocity of debt variable.

The discussion of Schumpeter is, however, only a minor preliminary element of Keen's paper. The more substantive points of his argument are drawn from the work of Hyman Minsky whom Keen believes to have held broadly the same position as himself.

3.2.2 Keen's reading of Minsky

For his derivation of the argument from Minsky, Keen mainly draws on the former's earlier work, particularly the article *Can "It" Happen Again?* (originally published in 1963 and reprinted as chapter 1 in Minsky (1984)) and *John Maynard Keynes* (1975/2008).

He begins by quoting at some length from Minsky (1984). In the quote, Minsky derives a condition that is equivalent to the one developed above, though not formulated as termi-

nologically precisely, namely that *realised* (ex-post) sectoral balances necessarily have to sum to zero, that is, ΔNFA must be zero. Minsky then unfortunately goes on to make an error that appears time and again in economic writing.

He states that the fact that realised sectoral balances always sum to zero must be the outcome of "market processes" (ibid. p. 6) of some description which somehow ensure that this condition is fulfilled and that "ex-ante saving and investment plans are reconciled" (ibid. p. 6). In essence, Minsky, as other writers from all schools of thought, interprets the $S = I$ accounting identity as an equilibrium condition that must somehow be 'produced', commonly through changes in interest rates or income depending on the analyst's theoretical outlook. That this notion is misleading is easily demonstrated.

Equation 12 above, which is reproduced here for convenience, shows that the income of the aggregate economy is equal to its production.

$$(23) \quad \begin{aligned} \sum y_t = Y_t &= \sum c_t + \sum i_t + \sum \Delta nfa_t = \\ C_t + I_t + 0 &= C_t + \Delta TA_t \end{aligned}$$

Drawing on the earlier definition of saving (equation 6) and the recognition that the net worth of the aggregate economy can only change through changes in its stock of tangible assets (since, as demonstrated in equation 11, the net financial assets of the aggregate economy are always equal to zero), it follows that:

$$(24) \quad C_t + \Delta TA_t = C_t + \Delta NW_t = C_t + S_t$$

$$(25) \quad S_t = \Delta TA_t = I_t$$

These relations imply that investment is macroeconomic saving, but also that macroeconomic saving *is* investment. Saving equals investment because, in the aggregate, it *is* investment. The statement that, in some sense, saving creates or finances investment is equivalent to saying that 'investment creates investment' or that 'saving creates saving' (for details see Lindner (2014)).

Similarly, the common post-Keynesian phrase that 'investment creates saving' appears terminologically problematic in this light as long as the term saving is not properly defined¹². Investment will, in a monetary production economy, generally give rise to revenues

¹²If 'saving' is taken to mean macroeconomic saving, the statement becomes just as tautological as its orthodox counterpart. On the other hand, elaborate post-Keynesian treatments of the $S = I$ identity appear to identify S with some form of financial saving, usually that of households. While it has indeed variously been shown, for example in the circuitist literature, that it is easy to construct example cases in which household financial saving equals macroeconomic investment. This can be achieved simply through

which potentially enable subsets of agents to save financially, but as shown in Lindner & Reissl (forthcoming), it is just as simple to construct examples in which investment is arbitrarily high whilst no sector saves financially at all, or in which financial saving is arbitrarily high while (net) investment is zero or even negative. Regardless of the empirical likelihood of any of these extreme cases, they show that there is no *strictly necessary* relationship between investment and financial saving, and hence that this cannot account for the savings-investment accounting identity which must hold even in the unlikeliest of cases. $S = I$ holds not due to some equilibrating mechanism, but because aggregate saving *is* investment.

The quantities appearing on the two sides of the $S = I$ equation are two different ways of denoting two variables that are in fact precisely the same, and not two distinct quantities that through some mechanism come to be equal to each other. It then becomes clear that the identity cannot be an equilibrium condition. To be an equilibrium condition, there would have to be a possibility for it to not hold under some circumstances.

In fact, the identity will hold at *any* point in time, regardless of whether or not the current plans of individual economic units are congruent when aggregated, that is, whether or not the economy is in 'expectational equilibrium'. It also holds regardless of how agents behave, and regardless of whether or not expectations are fulfilled.

Thus, even if, to use more conventional terminology, 'planned investment' and 'planned saving' differ in magnitude, actual investment and actual macroeconomic saving will be equal at any point in time because they are the same thing. The search for a mechanism that ensures that $S = I$ is a pseudo-problem ¹³.

Minsky then goes on to discuss the conditions for aggregate income to grow over time. In a demand-determined economy, this requires that aggregate/effective demand for goods & services produced during the period under consideration be greater than that during the previous period. This means (in general) that aggregate planned expenditures on currently produced goods & services be greater than the revenues realised therefrom during the previous period.

Minsky states that to finance the higher planned expenditures, at least some sectors will have to incur debt. As in much of his earlier work, Minsky here generalises from a partial observation (if I wish to increase my spending above what I expect to earn or already own, I have to go into debt) to aggregate relationships. At the aggregate level, earnings, i.e. revenues will increase *pari passu* with increased expenditures so that it cannot be said *a priori* which units, if any, will require debt to realise their expenditure plans. This is not

constructing the example in a way such that the investing sector runs an expenditure surplus equal to the amount of investment vis-à-vis the household sector and no other sector runs any deficits or surpluses vis-à-vis the investing sector or the household sector. However, this is not the way the identity should be interpreted, since, by virtue of being an identity, it will hold "no matter how strangely people may behave" (Stützel, 1978, p. 2).

¹³Behavioural assumptions are of course needed to theorise about how units are likely to react to incongruent plans/expectations but these are quite independent of accounting identities which will hold even if these assumptions turn out to be false.

to say that growth in aggregate demand will never be associated with increases in debt - it may well be - but rather that the generalisation may not be justified, with the actual outcome being an empirical question. An argument similar to the above was already used by Lavoie & Seccareccia (2001) to question the general validity of Minsky's financial fragility hypothesis insofar as it is based on the assumption of procyclical leverage ratios. Lavoie (2014a, pp. 326-327) also points to this line of reasoning in his critique of Keen's paper. This criticism also pertains to the arguments presented in Minsky's *John Maynard Keynes* (1975/2008) which Keen turns to next. However, even if Minsky's statement that rising aggregate demand will likely be associated with increases in debt is accepted with the appropriate caveats, it is a long way from Keen's assertion that effective demand equals income plus the (total) change in debt as embodied in equation 1.

The extract from *John Maynard Keynes* that Keen presents is problematic for a different reason. In this passage (ibid. pp. 131-134), Minsky constructs what he calls "the bare bones of a model" (ibid. p. 133) attempting to show how investment is financed. The problem with this section is that it is, somewhat unusually for Minsky, terminologically imprecise, a weakness that Keen's treatment of it does not remedy. Minsky constructs a "budget constraint" (ibid. p. 131) for households and firms, and assumes that some portion of (apparently previously created) household financial savings *in the form of means of payment* m are available to "finance investment" (Keen, 2014b, p. 274), that is, presumably, they can be borrowed by firms or acquired through share issues. Keen notes that any financing exceeding this amount has to be acquired through debt. In what way borrowing from households rather than banks does not create debt he does not say. Granted, there is arguably a difference between borrowing pre-existing means of payment from non-banks and the creation of means of payment for this purpose by banks, but nevertheless, both processes give rise to debt which has to be taken into account by an equation purporting to show a necessary link between debt and aggregate income.

In the section quoted, Minsky uses the concepts of 'saving', 'household saving', and what would correspond to financial saving in the terminology introduced above without sufficient differentiation, leading to substantial confusion. For instance, Minsky states that any investment exceeding intermediated household (financial) savings has to be financed by "some combination of an increase in the money supply and of a decrease in the money holdings in portfolios" (ibid. p. 132). Any "money holdings in portfolios", however, represent nothing else than pre-existing financial savings in the form of m whether they be held by households or some other sector. There is no conceptual difference between what Minsky calls household savings and these money holdings in portfolios.

That the terms 'saving' and 'household saving' are also treated interchangeably by Professor Keen is shown when he interprets Minsky's statement that "the externally financed investment must exceed the savings of households" (ibid. p. 133) to mean that "investment therefore had to exceed savings" (Keen, 2014b, p. 274). Keen apparently believes that the recognition that the volume of aggregate investment can differ from the value of pre-existing household financial savings in some way contradicts the $S = I$ identity, which

has been shown to be false.

Keen's view becomes clear when he claims that Minsky's work:

"Transcends Keynes on both 'income equals expenditure' and 'savings equal investment', with Keynes's [sic] identities applying in the abstraction of equilibrium, but Minsky's applying in the (normally) growing economy in which we actually live." (ibid. p. 275)

It is obvious that Keen treats the savings-investment identity as an 'equilibrium' condition, something I have above shown to be a fallacy. In addition, he asserts that an economy in equilibrium cannot be growing. It is easily seen that the concept of Keynesian 'expectational equilibrium' as developed above in no way implies stationarity. Even although the economy is unlikely to ever actually be in such an 'expectational equilibrium', conceptually it could be in such a state of equilibrium and at the same time be either growing, shrinking, or stationary as long as expectations are congruent. The $S = I$ identity will hold whether or not the economy is in equilibrium or disequilibrium of any description, and regardless of whether it is growing, shrinking, or stationary. There is little point in insisting on a distinction between "statics" and "dynamics" when discussing *identities*. The condition derived by Minsky, when interpreted in terms of clear, unambiguous definitions, is in fact little more than a roundabout way of saying that for income to grow relative to the previous period, this period's effective demand has to be greater than that of the previous period, making it difficult to see how this represents an extension of Keynesian thought. Drawing on the above derivation and clarification of the savings-investment-identity, the statement that "investment therefore had to exceed savings" (ibid. p. 274) can simply be interpreted to mean that $I_1 < I_2$ must hold for income to grow if demand for non-investment goods and services remains constant. It says nothing about how investment is financed and whether the increase in investment will be associated with increases in absolute levels of indebtedness. Lavoie (2014a, p. 324) makes a similar point in his critique.

Minsky does, however, transcend Keynes in acknowledging the endogeneity of money, something Keynes (1936/1939) does not do in the *General Theory*¹⁴ even although he quotes Dennis Robertson, a follower of Knut Wicksell who did treat the money supply as endogenous (which shows that endogenous money is neither necessary nor sufficient for refuting the fallacious loanable funds theory. On this see Lindner (2014).). Minsky laudably also uses an ex-ante ex-post framework, as I do in this paper, the lack of which in the *General Theory* is a major weakness of Keynes' work, as argued by Shackle (1965). Overall, Professor Keen displays a tendency to overinterpret the works he utilises as a foundation for his own argument, while these works themselves partly suffer from terminological imprecision. Having examined the theoretical part of Keen's paper, I now proceed to a brief discussion of the empirical evidence he presents before concluding.

¹⁴However, he arguably does so in other works.

3.2.3 Empirical evidence

Keen ends his paper by presenting two graphs showing correlations to support his argument. The first graph (Keen, 2014b, p. 287) shows two time series, one of US unemployment and one of the "change in private debt (measured as a percentage of GDP) times velocity" (ibid.). Keen finds a strong (negative) correlation between these two series for the timespan covered. Unfortunately, Keen does not provide details on how this 'velocity' variable was derived, and it is hard to see how it could have been derived other than in a tautological sense. This throws up the additional problem that it is not clear whether the velocity and indeed the correlation itself is stable during the period covered (a look at the graph suggests that this is not quite the case). If it is not, we are missing a theory of what governs changes in the velocity if the concept is to have explanatory and/or predictive value.

The second graph (ibid. p. 290) plots the changes in house prices against the acceleration in mortgage debt. Here, too, a high (positive) correlation is observed. There is no recourse to a velocity variable, and the measure of debt examined is a very specific one. Since, presumably, the vast majority of mortgage loans are used to purchase dwellings, the high correlation is to be expected, but hardly provides evidence to the claim that effective demand is income plus the *total* change in debt. Keen reasserts the claim that the purchase (and sale) of assets (including financial assets and pre-existing tangible assets) must be included in his version of effective demand (as well as aggregate supply) to produce "a truly monetary macroeconomics" (ibid. p. 284). This, once again, effectively severs the link between effective demand and aggregate income that is a hallmark of the post-Keynesian approach. Almost any flow of money is now classified as part of aggregate/effective demand, which would lead one to question what the purpose of this concept, redefined in such a fashion, is supposed to be.

Quite apart from any doubts over the presented evidence, the issue with Professor Keen's argument is not primarily an empirical one. Its main defects lie in the terminological and conceptual deficiencies outlined above, and in the fact that it never becomes quite clear what Keen is in fact trying to prove.

4 Summary and Conclusion

This paper has provided a critique of Steve Keen's argument that effective demand is equal to income plus the change in debt, drawing upon a framework of analysis derived from the work of Wolfgang Stützel which was outlined in the second section.

One main point of critique was that Keen tends to overinterpret the works upon which he bases his view and exports some of their weaknesses into his own theory. With regard to the substantive part of his argument, it was shown how these weaknesses affect his own efforts. I provided a balance mechanical analysis of the relationship between effective demand, income, and changes in debt, arguing that there is no necessary relationship

whatsoever between the level of effective demand or income and debt. I also showed that Keen's redefinition of effective demand to include the purchase of financial assets makes little sense, while at the same time severing the link between effective demand and aggregate income which is characteristic of the post-Keynesian school.

Professor Keen's velocity of debt variable, although necessary to (mostly) prevent his equations from being flatly false, is theoretically empty and thus has neither predictive nor explanatory value. While I expressed doubts about the empirical evidence he presents, the problems with Keen's argument are not foremost an empirical issue. Indeed, it was never disputed throughout this critique that changes in debt can have an influence on effective demand and hence income. Rather the main difficulty is that it never becomes quite clear what Professor Keen really wants to show - he gets caught up in a definitional mess that ultimately defeats the initial purpose of his analysis.

Overall, then, Keen's argument is highly questionable, particularly in its present state. One step forward would be to develop a theory of what determines his velocity variable (if this is at all possible). Nevertheless, this would still leave the other weaknesses mentioned unaddressed.

The development of endogenous money theory and its implications has been an invaluable contribution of the post-Keynesian school of economics. Professor Keen's paper does not represent an extension of these or, as he claims, the inception of "a truly monetary macroeconomics" (Keen, 2014b, p. 284) - something which, in all major respects, post-Keynesian economics already is.

References

- Bernanke, Ben**, *Essays on the Great Depression*, Princeton, NJ: Princeton University Press, 2000.
- Godley, Wynne**, “Seven Unsustainable Processes - Medium-Term Prospects and Policies for the United States and the World,” *Special Report, Levy Economics Institute*, 1999.
- **and Marc Lavoie**, *Monetary Economics. An Integrated Approach to Credit, Money, Income, Production and Wealth. Second Edition*, Basingstoke: Palgrave Macmillan, 2012.
- Keen, Steve**, *Debunking Economics - Revised and Expanded Edition: The Naked Emperor Dethroned?*, London: Zed Books, 2011.
- , “Modeling Financial Instability,” *Working Paper*, 2014a. Available online: <http://www.debtdeflation.com/blogs/wp-content/uploads/2014/02/Keen2014ModelingFinancialInstability.pdf>.
- , “Endogenous money and effective demand,” *Review of Keynesian Economics*, 2014b, 2 (3), 271–291.
- Keynes, John M.**, *The General Theory of Employment, Interest and Money*, London: MacMillan, 1936/1939.
- Lavoie, Marc**, “A comment on ‘Endogenous money and effective demand’: a revolution or a step backwards?,” *Review of Keynesian Economics*, 2014, 2 (3), 321–332.
- **and Mario Seccareccia**, “Minsky’s financial fragility hypothesis: a missing macroeconomic link?,” in Riccardo Bellofiore and Piero Ferri, eds., *Financial Fragility and Investment in the Capitalist Economy - The Economic Legacy of Hyman Minsky, Volume II*, Cheltenham: Edward Elgar, 2001, pp. 76–96.
- Lindner, Fabian**, “Does Saving Increase the Supply of Credit? A Critique of Loanable Funds Theory,” *IMK Working Paper*, 2014.
- **and Severin Reissl**, “Balance Mechanics and Macroeconomic Paradoxes,” *IMK Working Paper*, forthcoming.
- Minsky, Hyman P.**, *John Maynard Keynes*, New York: McGraw Hill, 1975/2008.
- , *Can “It” Happen Again? Essays on Instability and Finance*, New York: M. E. Sharpe, 1984.
- Myrdal, Gunnar**, *The Essential Gunnar Myrdal*, New York: The New Press, 2005.
- Palley, Thomas I.**, “Effective demand, endogenous money, and debt: a Keynesian critique of Keen and an alternative theoretical framework,” *Review of Keynesian Economics*, 2014, 2 (3), 312–320. All citations therefrom given here refer to a version freely available at: http://www.thomaspalley.com/docs/research/ad_and_debt.pdf.
- Schumpeter, Joseph A.**, *The Theory of Economic Development*, New Brunswick: Transaction Publishers, 1934/2012.
- Shackle, George L. S.**, *A Scheme of Economic Theory*, London: Cambridge University Press, 1965.

Stützel, Wolfgang, *Volkswirtschaftliche Saldenmechanik*, 2nd ed., Tübingen: Mohr Siebeck, 1978.

– , *Paradoxa der Geld- und Konkurrenzwirtschaft*, Aalen: Scientia Verlag, 1979.