real-world economics review, issue no. 72
subscribe for free

A critique of Keen on effective demand and changes in debt[1]

Severin Reissl [Kingston University, UK]

Abstract
In a paper for the *Review of Keynesian Economics*, Steve Keen recently provided a restatement of his claim that "effective demand equals income plus the change in debt". The aim of the present article is to provide a detailed critique of Keen's argument using an analytical framework pioneered by Wolfgang Stützel which has recently been developed further. Using this framework, it is shown that there is no strictly necessary relationship whatsoever between effective demand and changes in the level of gross debt. Keen's proposed relation is shown not to hold under all circumstances, and it is demonstrated that where it does hold this is due to variations in the 'velocity of debt'-variable he introduces. This variable, however, lacks theoretical underpinning. The article also comments on Keen's proposal that trade in financial assets should be included in effective demand, arguing that this undermines the concept of effective demand itself. It is also shown that many weaknesses in Keen's argument stem from a lack of terminological clarity which originates in his interpretation of the works of Hyman Minsky.

JEL codes E12, E20, E44, E51

Keywords effective demand, endogenous money, debt, balance mechanics

1. Introduction

For a few years, Steve Keen has been advancing the hypothesis that *effective demand equals income plus the change in debt*, and has provided various formulations of this argument. This article focuses on his most recent restatement thereof in the *Review of Keynesian Economics (ROKE)* (Keen, 2014a) as part of a symposium on the matter. The aim is to provide a detailed critique of Keen's argument. An analytical framework – balance mechanics - adapted from a paper co-written by the present author is used to examine Keen's claims. Two general objections will be raised against the argument in his original paper. Firstly, his "velocity of debt" is a variable lacking theoretical underpinning which, whilst necessary for the argument, is essentially left undetermined to pick up all the contingencies Keen does not take into account. It will be formally shown that there is no strictly necessary relationship between effective demand and changes in debt. Secondly, Keen introduces a questionable redefinition of key terms and his argument suffers from a lack of definitional clarity partly carried over from the work of Minsky.

We will also refer to three critiques that have appeared alongside Keen's article, one by Palley (2014), one by Lavoie (2014a), and one by Fiebiger (2014). This critique will contribute to the debate through the original application of the balance mechanics framework to Keen's hypothesis. The framework is used to show that the proposed relation in Keen (2014a) does not hold under all circumstances, which is a novel point as well as the main conclusion. It will also be shown that where the equation does hold, this is due to variations in the velocity variable. However, Keen provides no theory of what governs changes in this variable. While

[1] I would like to thank Marc Lavoie, Engelbert Stockhammer, Fabian Lindner, Johannes Schmidt, and Jeanette Findlay for their helpful comments on various drafts of this paper.

arguments similar to this point have been made by others, our analytical framework allows us to establish this result in a formal manner.

This article is structured as follows: section 2 distinguishes Keen's hypothesis from other contributions in the post-Keynesian literature. Section 3 summarises Keen's original article, his rejoinder, and the main points raised in the three previous critiques. Section 4 presents the analytical framework that will be used to examine Keen's claims. Section 5 applies the balance mechanics framework to Keen's argument and discusses his interpretation of Minsky's work. Section 6 concludes.

2. Keen and the post-Keynesians

The role of credit in capitalist economies is, of course, central to post-Keynesian economics. A distinctive feature of this paradigm is that analyses are set in the context of a monetary production economy (see Keynes, 1973; Wray, 1999, p. 180), which forms the basis for the long-run non-neutrality of money. Money is seen as having evolved from early credit relationships (e.g. Tymoigne and Wray, 2006) while the money supply is held to be endogenously determined by the demand for bank credit (e.g. Lavoie, 2006; Dow, 2006), with the latter view gaining increasing acceptance outwith the post-Keynesian school (McLeay, Radia, and Ryland, 2014). It is important, however, as Palley (1992) notes, not to conflate too closely the issue of money supply endogeneity and the importance of financing relationships at large, since this may lead to a misplaced focus on the money supply in macroeconomic analysis. Palley (ibid.) proposes the term 'endogenous finance' to reflect the view that attention must be paid to bank as well as non-bank credit to appreciate the "potentially enormous elasticity in the economic system's capacity to finance transactions" (ibid., p. 2) which is generated by the financial system at large. This view is also expressed by Lindner (2015).

The notion of credit-driven business cycles, of booms fuelled by credit followed by financial crises and recessions caused and prolonged by excessive indebtedness is an essential component of the post-Keynesian literature, with much of it being built on the contributions of Minsky (1986/2008) (see e.g. Lavoie, 2009; Kapeller and Schütz, 2012; Stockhammer and Michell, 2014). The most widely used modelling approach in post-Keynesian economics, stock-flow consistent (SFC) modelling, is inherently well-suited for such analyses (Godley and Lavoie, 2012). The claim investigated in this article, however, has to be clearly distinguished from such arguments. The question at issue is not *whether* levels of (private[2]) debt or changes therein can have an impact on effective demand and consequently national income, or on macroeconomic stability. On this proposition there appears to be universal agreement in the post-Keynesian literature. Whether such a connection exists in a given context is then an empirical question. For instance, Stockhammer and Wildauer (2015) find a positive effect of household debt on consumption, but a negative one upon investment (including residential investment).

Keen's hypothesis is more fundamental and bold, namely that capitalist economies are *always and everywhere* credit-driven, that there is an immutable link between changes in aggregate (i.e. all types of) debt and changes in effective demand which can be expressed in a simple relation much like the equation of exchange (M*V = P*Y). Apart from the papers we

[2] Keen's argument applies equally to both private and public debt qualitatively (Keen, 2014a, pp. 284-285), although he appears to focus on the role of private debt.

shall examine here, earlier statements of Keen's argument can be found in Keen (2009a, 2009b, 2009c, 2011a, 2011b, 2012b, 2012c, 2013, & 2014c). In addition, a significant part of the debate has taken place on blogs (see Keen, 2011d, 2012a & 2014b; Mason, 2012; V. Ramanan, 2012 & 2014; Edmonds, 2014a & 2014b).

The next section will provide a summary of Keen's article and present the most substantial points from the three critiques which appeared alongside it.

3. Keen's argument and previous critiques

Using the example of an increase in effective demand, which is the one he appears to focus on, Keen's argument can be summarised thus: If there is a positive difference between the present period's effective demand and the previous period's realised aggregate income, this difference has to be financed by an increase in debt. Effective demand is then equal to the previous period's income plus the change in total debt multiplied by a velocity of circulation variable (a discussion of this variable is provided below). Keen's theory can be neatly summed up in an equation used by both Lavoie (2014a, p. 322) and Palley (2014, pp. 313-314) in their critiques and also presented by Fiebiger (2014, p. 300):

$$AD_t = Y_{t-1} + v_t * \Delta D_t \quad (1)$$

Where AD is aggregate or effective demand[3], Y is aggregate income, v is the 'velocity of debt' and ΔD is the total change in the stock of all debt in the economy during the period under examination. Keen additionally divides the variable _D into different components according to the purpose for which the debt is incurred (Keen, 2014a, pp.284-285). However, equation (1) can be seen as an adequate shorthand representation of the relations presented in Keen (2014a), since Keen himself presents an almost identical relation at one point in his paper (Keen, 2014a, p. 283), the only difference being notational, and has used it in other works (e.g. Keen 2014c, pp. 12-13). All statements about equation (1) made below are valid for the more detailed relations presented in Keen (2014a), since all these relations incorporate the basic hypothesis summarised in equation (1). He further argues that since "monetary expenditure is on both goods and services and assets" (Keen, 2014a, 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 Pigou, Schumpeter and Minsky as antecedents to his argument. He provides a discussion of the velocity variable, a description of endogenous money creation, and a section arguing that his approach is consistent with what he views as the identity of expenditures and income. He concludes his argument by presenting some empirical data.

Palley (2014) notes that Keen's equation is deficient in assuming that agents invariably have expenditures equal to the previous period's aggregate income (Y_{t-1}), unless there is a change in the amount of debt (i.e. $\Delta D_t \neq 0$). As such, changes in the amount of debt become the sole

[3] For a textbook treatment of the principle of effective demand, see Lavoie (2014b, Ch. 5). Keen's article does not contain a definition of effective demand. As far as can be deduced, effective demand in period t is simply taken to be equal to total expenditures in period t. We shall adopt a slightly more nuanced definition in section 5.

factor driving changes in effective demand, to the exclusion of other typical Keynesian factors such as the distribution of income.

Fiebiger (2014) criticises Keen for a lack of definitional clarity as well as an inconsistent use of time-subscripts in his period-analysis. These deficiencies, according to Fiebiger, lead Keen to proclaim trivial statements as novel insights and serve to obscure his argument. Fiebiger laments that Keen insufficiently distinguishes between endogenous money creation through private bank credit and the impact of private sector debt at large, often appearing to identify the one with the other. Fiebiger shows that most private sector debt is non-bank credit. On this basis, he questions Keen's empirical analysis.

Lavoie (2014a)[4] points out that if v_t 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), a point closely related to our discussion below. Lavoie also notes that Keen performs a considerable leap from arguing that changes in debt can have a considerable influence on effective demand to claiming that effective demand equals income plus the change in debt – a distinction we also pointed to above.

The next section introduces the analytical framework we shall utilise for our critique.

4. Balance mechanics

The 'balance mechanics' method of analysis was devised by Wolfgang Stützel in his two major works (Stützel, 1978 & 1979) and bears resemblance to Godley's sectoral balances approach (see e.g. Godley, 1999) as well as to SFC modelling (Godley and Lavoie, 2012). While Stützel's work is not well-known today, it has maintained a number of advocates (see e.g. Schmidt, 2009 & 2012; Flassbeck, 2001 & 2011) and has attracted renewed interest in the wake of the financial crisis, which led to Stützel (1978) being reprinted. The formalisation of the balance mechanics framework as utilised here was initially undertaken by Lindner (see Horn & Lindner, 2011; Lindner, 2012, 2014 & 2015). The most recent version was developed in a manuscript by Lindner and the present author (Lindner and Reissl, 2015). The content of this section is an abbreviated version of section 1 in Lindner and Reissl, (2015), and a very similar section can be found in Lindner (2015). The balance mechanics approach is characterised by two elements. The first consists of simple accounting relationships:

The balance sheet of any economic unit (an individual, a household, a firm, etc.) 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[5]:

$$ta + gfa - l = nw \tag{2}$$

Net financial assets, *nfa*, are the difference between *gross* financial assets and liabilities:

$$gfa - l = nfa \tag{3}$$

[4] Some of the points made by Lavoie can also be found in his recently published textbook, in which a subsection is dedicated to the debate (Lavoie, 2014b, pp. 271-273).
[5] Stocks are here treated as liabilities for the issuer (and thus as financial assets for the holder) in line with common accounting conventions (Eurostat, 2013; Lindner, 2015).

Gross financial assets can be further split into means of payment *m* and all other financial assets, *ofa*[6]:

$$gfa = m + ofa \tag{4}$$

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 alters:

$$\Delta nw_t = \Delta ta_t + \Delta nfa_t \tag{5}$$

In the absence of asset price changes, *nfa*, *ta* and *nw* can only change if the quantities of financial assets and/or liabilities and/or tangible assets held changes[7].

4.1 Flows

We shall clearly distinguish three classes of flows which affect the balance sheet variables discussed above.

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

$$y_t - c_t = s_t = \Delta nw_t \tag{6}$$

Saving *s* here denotes the difference between all additions and all reductions in net worth during a period. Investment (that is, by definition, a change in the quantity of tangible assets) is hence only 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

$$r_t - e_t = \Delta nfa_t \tag{7}$$

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 side[8].

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

$$receipts_t - payments_t = \Delta m_t \tag{8}$$

[6] As noted in Lindner and Reissl (2015), the distinction between *m* and *ofa* will of course be subject to change and context-dependent (for instance, demand deposits are a means of payment in transactions between non-banks but not in transactions between banks). The distinction nevertheless exists and lies at the heart of any liquidity crisis.
[7] Lindner and Reissl (2015) provide a version of the balance mechanics framework incorporating asset price changes. Since this is not required for the argument presented here, we limit ourselves to a simpler version. This is hence closer to the one used by Lindner (2015).
[8] *nfa*, as indicated above, can also change if the price of financial assets changes. As noted, we abstract from changes in asset prices here.

Although these terms are often used interchangeably, it is important to make this distinction. It is possible, for example, for a transaction to give rise to income but no revenue, or a revenue but no receipt, or a receipt but no revenue. For instance, the sale of a financial asset gives rise to a receipt for the seller, but does not generate revenue since net financial assets do not change. This can hence be termed a purely financial transaction. Similarly, if a unit receives a loan, it realises a receipt but its net financial assets are not altered (although they will be altered by interest payments, which is why these, despite the common designation as 'payments', are classified as expenditures). The production of a good generates income, but does not give rise to a revenue until the good is sold. Lindner (2015) and Lindner and Reissl (2015) provide more detailed examples.

4.2 Groups and the aggregate economy

The second 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 a single firm, a particular sector such as households, 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, using a terminology introduced by Stützel (1978):

Partial statements are valid for groups, while *global statements* are valid for the aggregate economy. The application of a partial statement to the aggregate economy is very often only possible through the addition of highly restrictive assumptions; otherwise it is an outright fallacy of composition. *Relational statements* describe the behaviour of the complementary group 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 partial relationships.

This approach can be illustrated by considering that, following the above equations, the income during a period t of any *genuine subset* (i.e. group) of economic actors is given by:

$$y_t = c_t + \Delta ta_t + \Delta nfa_t = \tag{9}$$

$$c_t + i_t + \Delta nfa_t = c_t + \Delta nw_t$$

The revenues and expenditures of any group j during a period can obviously differ from each other. For the aggregate economy, however, *realised* revenues and expenditures (but not necessarily payments and receipts, see Lindner (2015, p. 10)) are always exactly equal[9]:

$$0 = \sum_{j=1}^{N} (r_j - e_j)_t = R_t - E_t \tag{10}$$

Similarly, to every financial asset fa_k there is a corresponding liability l_k, so that the aggregate economy's net financial assets as well as changes therein are always necessarily equal to zero:

[9] Throughout this article, lower case symbols denote variables pertaining to groups whilst upper case symbols denote variables pertaining to the aggregate economy.

$$(11) \qquad 0 = \sum_{k=1}^{K}(fa_k - l_k) = \sum_{j=1}^{N}(\Delta fa_j - \Delta l_j)_t = \sum_{j=1}^{N}(\Delta nfa_j)_t = FA - L = \Delta FA_t - \Delta L_t$$

Thus, while any group can save financially (*partial statement*) to the extent that the complementary group dissaves financially (*relational statement*), the aggregate economy *cannot* save financially (*global statement*), i.e. in the form of financial assets[10].

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

$$(12) \qquad \sum_{j=1}^{N}(y_j)_t = Y_t = \sum_{j=1}^{N}(c_j)_t + \sum_{j=1}^{N}(i_j)_t + \sum_{j=1}^{N}(\Delta nfa_j)_t =$$
$$C_t + I_t + 0 = C_t + \Delta TA_t$$

Having introduced and illustrated the basic features of the balance mechanics approach, we now begin with an examination of Keen's article and develop the framework further as required for this.

5. Endogenous money and effective demand

Keen (2014a) begins the substantive part of his argument by constructing a set of equations describing the aggregate consumption expenditures of workers and those of capitalists, as well as investment expenditures. The volume of each of these aggregates 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, 2014a, p. 277) of newly created debt *to the banking sector*[11]. For instance, the consumption expenditure of workers is here equal to the previous period's wages plus the sum of their newly incurred bank 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 issue arising 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" (ibid.).

However, any means of payment corresponding to wages (or distributed profits, or retained earnings) are apparently, in addition to being invariably spent in their entirety, only spent once (since there is no separate velocity variable attached to them). This is so since, according to Keen, changes in the velocity of *pre-existing* money balances are a "second-order process" (ibid.). In what way money balances newly created by bank lending are fundamentally different from pre-existing ones in this respect does not become clear.

[10] This argument is presented at greater length and expanded upon in Lindner's (2015) critique of the loanable funds model.
[11] Hence, the velocity variable may be defined as giving the amount of additional expenditure generated by an increase of the stock of bank debt by one currency unit.

In fact, Keen claims in section 9 of his paper that the velocity of debt variable is identical to the velocity of money. He argues that this follows from endogenous money theory, according to which "in a pure credit economy, the amount of money [...] is the initial amount (created by fiat) plus the current level of debt" (ibid. p. 283). 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 (Gardiner, 2004). The confusion arises since Keen appears to treat the terms 'debt' and 'bank debt' as equivalent. When a commercial bank extends a loan, it simultaneously creates a deposit, which is a liability of the bank to the non-bank sector. This becomes part of the money supply and thus increases the stock of means of payment. In this sense, then, bank debt is indeed money. However, there clearly are types of debt, even in a pure credit economy, which are not monetised, i.e. not generally accepted as means of payment (corporate bonds being one example). Keen even appears to recognise this at an earlier point in his paper (ibid., p. 278) but makes the argument here regardless.

Although the two variables are claimed to be identical, the velocity of existing money balances is dropped from his equation whilst the velocity of newly created money balances ('debt') is taken to determine changes in demand. This consequently entails the implicit assumptions that a) all pre-existing money balances are spent precisely once per period and are neither saved nor lent out and that b) therefore all newly created debt *must be* to the banking sector. These assumptions enable Keen to derive the proposition that any change in effective demand is equal to the "turnover of new [*bank*] debt" (ibid.). This reveals a more general problem with Keen's endeavours, namely that the need to make behavioural assumptions contradicts his previously stated intention to derive a 'law' or accounting identity[12]. An identity must hold regardless of which assumptions are made about the behaviour of agents. Of course, Keen not only wishes to construct an identity, but also wants to show that within this relation, causality runs in a particular direction, with this being implied by the time-subscripts in equation (1). This may explain why Keen appears to be going back and forth between building models using behavioural assumptions and redefining accounting concepts (see section 5.2). It will be shown below that there are cases in which Keen's equation does not hold.

5.1 Balance Mechanics and changes in gross debt

We now draw upon the accounting relationships developed above to show why equation (1 or any version of it appearing in Keen (2014a)) is problematic. We shall extend the balance mechanics framework and use it to construct two sample cases which show that Keen's equation does not hold under all circumstances and that where it does hold, this is due to variations in the velocity variable. While the velocity variable often, but not always, saves the equation from returning an incorrect result, it is a theoretically empty concept which renders the relation devoid of informational content. If its value can only be identified in a tautological fashion (Lavoie, 2014b), it is difficult to see what the purpose of the theory should be, since it then can be neither prediction nor the explanation of observed phenomena[13].

[12] For instance, in the abstract to the *ROKE* paper, Keen writes that he aims to replace "the accounting truism that ex post expenditure equals ex post income with the endogenous money insight that ex post expenditure equals ex ante income plus the ex post turnover of new debt" (Keen, 2014a, p. 271). In other works, this proposition has been termed the 'Walras-Schumpeter-Minsky *Law*' (e.g. in Keen, 2011b, 2012a,b), suggesting that Keen does not merely wish to show that it is *possible* for economies to be debt-driven, but rather that his proposition will hold good under all circumstances.

[13] To simply state ex-post that the velocity has changed does not constitute a satisfactory explanation of changes in effective demand since Keen does not provide a theory of what governs changes in velocity. Changes therein could thus always be invoked in order to immunise the theory from criticism (Albert, 2012).

5.1.1 Plans and Expectations

To illustrate the problems with Keen's equation, we first extend the analytical framework presented in section 4. The content of this section is adapted from Lindner and Reissl (2015). An earlier version can be found in Lindner (2015). Section 4 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, an excess notional demand/supply framework can be used. This is inspired by Myrdal's work on monetary equilibrium (see e.g. Myrdal, 2005) as well as Shackle's discussion of Keynesian "kaleido-statics" (Shackle, 1965) and bears resemblance to Patinkin's (1958) excess demand/supply framework.

Abstracting from taxes and transfers, revenues and expenditures during a period 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 & P_{TA}*Q_{TA}, labour services, measured (for example) in hours of employment *EMP*, where *W* is the wage, W*EMP, as well as interest payments on pre-existing financial assets and liabilities, INT*FV , where *FV* stands for face value and *INT* is the interest rate. While *realised* aggregate expenditures are necessarily equal to *realised* aggregate revenues, planned aggregate expenditures can obviously differ from expected aggregate revenues. With R_{exp} and E_{pl} denoting expected aggregate revenues and planned aggregate expenditures respectively, we can write:

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

The above equation shows aggregated planned/expected current account transactions. A similar equation can be formulated for financial account transactions. $\Delta NFA_t^{pl/exp}$ is 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:

$$\Delta NFA_t^{pl/exp} = \Delta M_t^{pl/exp} + \Delta OFA_t^{pl/exp} - \Delta L_t^{pl/exp} \tag{14}$$

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

$$
\begin{aligned}
&\Delta NFA_t^{pl/exp} = (R^{exp} - E^{pl})_t = \\
&(P * (Q^s - Q^d) + W * (EMP^s - EMP^d) + \\
&Int * (FV_{FA,t-1} - FV_{L,t-1}) + P_{TA} * (Q_{TA}^s - Q_{TA}^d))_t = \\
&\Delta M_t^{pl/exp} + \Delta OFA_t^{pl/exp} - \Delta L_t^{pl/exp}
\end{aligned} \tag{15}
$$

While this equation refers to the aggregate economy, a similar one can be formulated for any group. 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 in that there is no aggregate planned/expected current account deficit/surplus, the economy is in a condition of what Stützel (1979, pp. 153-159) called "circular flow equilibrium", akin to Keynesian "expectational equilibrium" as described by Shackle (1965). It can prevail only if and as long as agents' expectations are congruent. To analyse the possible reactions to *incongruities* between plans/expectations, behavioural assumptions are required, meaning that we must go beyond "pure" balance mechanics. Using this framework we can then examine the movements of effective demand and the aggregate level of debt in various possible scenarios.

5.1.2 Effective demand and changes in debt

One of the most important characteristics of money from a balance mechanical perspective is that it is a medium allowing groups to run expenditure or revenue surpluses (Stützel, 1979, p.181)[14]. Consequently, if a group plans to make expenditures exceeding its expected revenues[15], 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 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 surpluses (*group 1*)[16], and one which, ex-ante, would have to borrow *from a banking sector* (in keeping with Keen), which for this purpose can be part of either group, to acquire m (*group 2*).

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 also in excess of expenditures thereon realised during the previous period. The other group plans expenditures on current output equal to its revenues realised on current output in the previous period and expects its revenues on current output to be constant relative to the previous period.
It is necessary to focus on expenditures on and revenues from goods and services produced (or, even more precisely, *value added*) during the period under examination since we wish to

[14] Of 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.
[15] Under the assumption that the amount of direct trade credit available is negligible.
[16] In a fiat money system, there will of course be a stock of liabilities somewhere in the system corresponding to this amount.

examine links between changes in debt and effective demand. A definition of effective demand should only include expenditures upon items contributing to current aggregate income. *Aggregate* income would not arise, for instance, from sales of pre-existing goods (tangible assets) since, strictly speaking, the aggregate income is generated by *production* rather than exchange. Since Keen only focuses on the determination of the magnitude of effective demand itself, and not on how precisely changes therein translate into changes in aggregate income, we can largely avoid this issue, a detailed discussion of which would go beyond the scope of this article[17]. Hence, 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 and services. Aggregate expenditures on such goods and services may be termed effective demand for our purposes[18]. Y_{t-1} in equation (1) is taken to be equal to the previous period's effective demand thus defined.

We can then write for one group (regardless of whether it is group 1 or 2):

$$\Delta nfa_t^{pl/exp} < 0 = (r^{exp} - e^{pl})_t = \Delta m_t^{pl/exp} + \Delta ofa_t^{pl/exp} - \Delta l_t^{pl/exp} \tag{16}$$

and for the other group:

$$\Delta nfa_t^{pl/exp} = (r^{exp} - e^{pl})_t = 0 = \Delta m_t^{pl/exp} + \Delta ofa_t^{pl/exp} - \Delta l_t^{pl/exp} \tag{17}$$

This means that in the aggregate, plans to reduce *nfa* outweigh plans to increase *nfa*, leading to an aggregate planned current account deficit:

$$\Delta NFA_t^{pl/exp} < 0 = (R^{exp} - E^{pl})_t = \Delta M_t^{pl/exp} + \Delta OFA_t^{pl/exp} - \Delta L_t^{pl/exp} \tag{18}$$

If the group holding means of payment (group 1) is the one planning a current account deficit, it plans to finance this by reducing its stock of *m*. If the other group (group 2) 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 in *m* 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 as set out above are incongruent in the aggregate (since $\Delta NFA^{pl/exp} \neq 0$), without additional assumptions, the framework does not allow one to predict what the

[17] For some views on this matter see Hartwig (2002) and Allain et al. (2013).
[18] Strictly speaking, the examples which follow assume that no revenue or expenditure surpluses on 'non-effective demand items' are realised. While this assumption is undoubtedly highly unrealistic, it allows us to pinpoint very precisely the problem with Keen's hypothesis

consequences of this will be. The framework does, however, give the possibility of examining various possible outcomes. We shall consider two simple cases.

Case 1

Consider the case in which group 1 successfully realises an expenditure surplus[19] (as well as, by assumption, current expenditures in excess of previous expenditures), which implies that group 2 necessarily realises a revenue surplus of the exact same size:

$$(\Delta nfa_1)_t = (r_1 - e_1)_t < 0 \tag{19}$$

$$(\Delta nfa_2)_t = (r_2 - e_2)_t > 0 \tag{20}$$

$$|\Delta nfa_1|_t = |\Delta nfa_2|_t \tag{21}$$

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. By assumption, aggregate expenditures (here = effective demand) have risen relative to the previous period, and so, therefore, have aggregate revenues. At the same time, however, the level of gross debt has not changed so that the term *ΔD* in equation (1), which is equivalent to our term *ΔL*, is zero. Hence, even if the velocity variable became arbitrarily large, Keen's equation would show that effective demand had not changed at all and would hence predict that aggregate income should remain constant. Table 1 summarises these results[20].

Quite apart from these considerations, debt could also 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 (that is, a transaction which only affects the financial account, e.g. the sale of a pre-existing financial asset) and consequently used by that group reduce any pre-existing debt that it might have. Debt could, of course, also *increase* if it is incurred to finance any other financial account transactions which may take place. All of these effects would be picked up by variations in Keen's velocity variable (in the possible case where debt decreases but effective demand rises, the velocity would have to become negative).

[19] We choose this example case since it is well suited for showing the problematic nature of Keen's equation. More generally there is of course no necessary relationship whatsoever in the aggregate between the size of any revenue or expenditure *surpluses* and the volume or growth of effective demand, as Stützel (1979) demonstrates at length.
[20] Note that the first three rows show changes in the magnitude of flows relative to the preceding period, whereas the last three rows show changes in stocks, i.e. flows, without reference to the previous period. For the last three rows, the magnitude of the flow in the preceding period is of no consequence.

Table 1			
	Group 1	Group 2	Aggregate Economy
Change in revenues	$r_t^1 - r_{t-1}^1 = 0$	$r_t^2 - r_{t-1}^2 > 0$	$R_t - R_{t-1} > 0$
Change in expenditures	$e_t^1 - e_{t-1}^1 > 0$	$e_t^2 - e_{t-1}^2 = 0$	$E_t - E_{t-1} > 0$
Change in effective demand	$AD_t^1 - AD_{t-1}^1 > 0$	$AD_t^2 - AD_{t-1}^2 = 0$	$AD_t - AD_{t-1} > 0$
Change in debt	$\Delta d_t^1 = 0$	$\Delta d_t^2 = 0$	$\Delta D_t = 0$
Change in net financial assets	$\Delta nfa_t^1 < 0$	$\Delta nfa_t^2 > 0$	$\Delta NFA_t = 0$
Change in means of payment	$\Delta m_t^1 < 0$	$\Delta m_t^2 > 0$	$\Delta M_t = 0$

Case 2

Another possible case is that in which it is group 2 that plans and realises an expenditure surplus, i.e. the precise opposite from the situation depicted in equations (19) and (20). By assumption, group 2 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. Effective demand has increased as well. This result, summarised in table 2, appears to be in line with 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[21]. On the other hand, absolute levels of debt could also increase through purely 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.

[21] Recall that the two groups as we have defined them are not assumed to be in any way homogeneous, so that this possibility is not as unlikely as it may appear.

Table 2			
	Group 1	Group 2	Aggregate Economy
Change in revenues	$r_t^1 - r_{t-1}^1 > 0$	$r_t^2 - r_{t-1}^2 = 0$	$R_t - R_{t-1} > 0$
Change in expenditures	$e_t^1 - e_{t-1}^1 = 0$	$e_t^2 - e_{t-1}^2 > 0$	$E_t - E_{t-1} > 0$
Change in effective demand	$AD_t^1 - AD_{t-1}^1 = 0$	$AD_t^2 - AD_{t-1}^2 > 0$	$AD_t - AD_{t-1} > 0$
Change in debt	$\Delta d_t^1 = 0$	$\Delta d_t^2 > 0$	$\Delta D_t > 0$
Change in net financial assets	$\Delta nfa_t^1 > 0$	$\Delta nfa_t^2 < 0$	$\Delta NFA_t = 0$
Change in means of payment	$\Delta m_t^1 > 0$	$\Delta m_t^2 = 0$	$\Delta M_t > 0$

Implications

The conclusion to be drawn from the analysis above is that in the aggregate, changes in absolute levels of debt bear *no strictly necessary* relationship whatsoever to the level of effective demand. We have identified one case in which Keen's equation does not hold. In the other, it only does so through variations in the velocity variable. However, Keen's paper contains no theory of how this variable is determined. Indeed, it would be surprising if it did since, being a concept similar to the velocity of money, Stützel's criticism of the latter applies to the 'velocity of debt'. It is worth quoting from Stützel's (1978, p. 236) discussion of the velocity of money in a credit economy (own translation)[22]:

> "[...] it is not apparent how one should conceive of a 'velocity' of means of payment under such circumstances - since there is no fixed supply of means of payment which change hands more or less often. The means of payment are there rather created ad hoc, and disappear again soon thereafter. 'Change of hands' or 'frequency of use' – all this presupposes an object which exists in the one hand and still exists in the other, an object which before and after use is identical. [...] [The concept] breaks down precisely in those cases in which we are most in need of clear monetary theoretic foundations, namely when stocks of means of payment change through monetisation and demonetisation of financial assets."

It may be possible to measure the values of the other variables appearing in Keen's equation and to label the residual the "velocity" of debt, but any insight gained therefrom will be minimal. The difficulty is that in contrast to net debt, gross debt can in principle always be reduced through an equal reduction of assets (although note the complications potentially arising from the paradox of liquidity (Lindner and Reissl, 2015; Dow, 1987)) and can also theoretically increase without bounds without directly affecting net debt. The distinction

[22] A worthwhile and more general discussion of what Stützel terms the "naive quantity theory" of money can be found in Stützel (1979, Ch. 4).

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 per period is not sufficiently determined by the size of planned and/or realised expenditure surpluses. In this sense, debt is merely a residual[23], and ex-post changes in the absolute level of debt allow no conclusions about the likely volume or growth of effective demand (and, by extension, aggregate income) or even about whether expenditure or revenue surpluses have occurred and to which extent. This is not to imply that changes in debt cannot have an influence on effective demand or aggregate income. Rather, what it implies is that a 'black box'-type-relation is unable to capture this notion other than, at best, in a tautological fashion. Keen has demonstrated (e.g. Keen, 2014d) that it is perfectly possible to construct models in which there is a stable link between debt and effective demand. However, it was demonstrated above that while changes in debt may well closely correspond to changes in effective demand, this is not necessarily so from a pure accounting perspective. Keen appears to recognise this in section 10 of his paper, but attempts to navigate around the problem in a questionable fashion.

5.2 Keen's inclusion of "speculation" in financial assets

The previous section demonstrated that it is not possible to determine movements in the aggregate level of indebtedness from changes in effective demand alone. 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 [finance, insurance and real estate] sector" (Keen, 2014a, p. 284). He attempts to rectify this problem by claiming that a purchase of financial assets should be classified as an expenditure and be counted as part of effective demand. In section 4 of this article, we set out to define very carefully what is meant by the term "expenditure", as distinct from "payment" and "consumption". It is a transaction which alters the net financial assets of the unit undertaking it. This is surely a reasonable and uncontroversial definition.

Keen's redefinition would mean to effectively eliminate the accounting distinction between financial assets on the one hand and non-financial assets, goods, and services on the other, since the purchase or sale of either would have to be recorded as a current account transaction if it gave rise to revenue/expenditure. This appears to be a rather arbitrary redefinition of terms particularly as it still does not establish a link between debt and *effective demand*, properly defined as a variable which determines aggregate income. This point is also made by Fiebiger (2014), but it is worth elaborating upon. *Aggregate* income would still be equal to aggregate production and a change in the number of purchases and sales of existing financial assets, although under this redefinition giving rise to expenditures and revenues, would not *in and of itself* have any influence on aggregate income. Keen, however, appears to make precisely this claim, given that total expenditure is now taken to include 'expenditures' on financial assets, but that this sum still appears to correspond to effective demand in that the 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 demonstrates is that a debt-financed increase in (redefined) aggregate expenditure gives rise to an equal amount of (redefined) revenue. Indeed, it is claimed that the volume of expenditures per period is *equal* to income during that period, a proposition that is surely not generally true (as is also noted by Stützel,

[23] Which does not mean that debt levels cannot grow to excessive levels.

1979, p.274)[24]. For instance, in a hypothetical economy in which units only produce for their own consumption and investment, or even in one where trade is exclusively conducted through barter, aggregate income would differ from zero, since it would be equal to that economy's production, whilst revenues/expenditures would be nil. In a modern monetary production economy, 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. Keen's redefinition would sever the link between effective demand and aggregate income which is a basic characteristic of post-Keynesian economics. The next section will show that the lack of terminological clarity in Keen's article stems in part from his interpretation of Minsky's work.

5.3 Keen's reading of Minsky

Keen states that several authors held positions similar to his own. He lists Pigou, Schumpeter and Minsky, drawing in particular on the work of the latter to formulate his own argument. For his derivation of the hypothesis from Minsky, Keen mainly relies on the former's earlier work, especially the article *Can "It" Happen Again?* (originally published in 1963 and reprinted as chapter 1 in Minsky, 1982) and the book *John Maynard Keynes* (1975/2008).

He begins by quoting from Minsky (1982, Ch. 1). There, Minsky derives a condition that is equivalent to the one developed above, namely that *realised* sectoral financial balances necessarily have to sum to zero (i.e. $\Delta NFA_t = 0$). However, Minsky goes on to state that this must be the outcome of "market processes" (ibid. p. 6) which ensure that this condition is fulfilled and that "ex-ante saving and investment plans are reconciled" (ibid. p. 6). 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. We shall argue that this notion can be misleading.

5.3.1 The Saving-Investment Identity

Equation (12) above which is reproduced here shows that the income of the aggregate economy is equal to its production:

$$\sum_{j=1}^{N}(y_j)_t = Y_t = \sum_{j=1}^{N}(c_j)_t + \sum_{j=1}^{N}(i_j)_t + \sum_{j=1}^{N}(\Delta nfa_j)_t = \tag{22}$$

$$C_t + I_t + 0 = C_t + \Delta TA_t$$

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 (equation 11), it follows that:

[24] This is also the reason why our definition of effective demand is more specific than Keen's.

$$C_t + \Delta TA_t = C_t + \Delta NW_t = C_t + S_t \tag{23}$$

$$S_t = \Delta TA_t = I_t \tag{24}$$

These relations imply that, in a macroeconomic sense, investment *is* saving, but also that saving *is* investment. The quantities appearing on the two sides of the S = I equation are two different ways of denoting what is in fact one and the same variable, 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. 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. It also holds regardless of how agents behave, and regardless of whether or not expectations are fulfilled (see also Lindner, 2015). 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[25]. The preceding discussion shows why it is vital to define precisely what is meant by the term 'saving' in any particular context (see also Stützel and Grass, 1988, p. 365). One can easily construct cases in which the *financial saving* of a group is arbitrarily large whilst investment equals zero, or *vice-versa* (Lindner, 2015). This terminological issue in turn besets Keen's interpretation of Minsky's *John Maynard Keynes*.

5.3.2 Transcending Keynes?

In the passage from *John Maynard Keynes* (Minsky, 1975/2008, pp. 131-134) quoted by Keen, Minsky constructs "the bare bones of a model" (ibid. p. 133) showing how investment is financed. The formulation, however, is terminologically imprecise. Minsky constructs "budget constraint[s]" (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, that is, presumably, they can be borrowed by firms or acquired through share issues[26]. According to Minsky, 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, i.e. by an increase in velocity" (Minsky, 1975/2008, p.132)[27]. "Money holdings in porfolios", however, is an imprecise or too general term in this context. It does not become clear what the conceptual distinction between these and financial savings in the form of m is meant to be. The former would comprise *any* money balances held by units, *including* the financial savings in the form of m of *all* sectors, as well as any other money balances acquired through purely financial

[25] Behavioural assumptions are needed to theorise about how units are likely to react to incongruent plans/expectations but these are independent of accounting identities which will hold even if these assumptions do not contain any equilibrating mechanisms.
[26] Keen (2014a, p. 274) notes that any investment exceeding this amount has to be "debt-financed". Why borrowing from households does not create debt he does not say. This is another instance where 'debt' and 'bank debt' are not distinguished.
[27] Note the distinction between Keen's conclusion that bank lending, i.e. an increase in the money supply, is strictly required and Minsky's more nuanced position.

transactions[28]. Minsky uses the concepts of "saving", "money holdings", "household saving", and what would correspond to financial saving in the terminology introduced above without sufficient differentiation.

That the terms "saving" and "household saving" are also treated interchangeably by Keen is shown when he interprets Minsky's statement that "the externally financed investment must exceed the savings of households" (Minsky, 1975/2008, p.133) to mean that "investment therefore [has] to exceed savings" (Keen, 2014a, p. 274), appearing to suggest that the recognition that the volume of aggregate investment can differ from the value of household financial saving in some way contradicts the S = I identity. This becomes clear when he claims that Minsky's work

> "[t]ranscends Keynes on both 'income equals expenditure' and 'savings equal investment', with Keynes's 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 saving-investment identity as an equilibrium condition. In addition, he asserts that an economy in equilibrium cannot be growing. However, it is easily seen that the "circular flow equilibrium" presented above does not imply stationarity as Stützel (1978) demonstrates at length in his critique of Walrasian general equilibrium. Even although the economy is unlikely to ever actually be in such an equilibrium, in principle it could be, 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 of any description, and regardless of whether or not it is stationary. It says nothing about how investment is financed. Keen may sometimes over interpret the works he utilises as a foundation for his own argument, while these works themselves suffer from terminological imprecisions. These imprecisions can, as demonstrated above, consequently also be found in Keen's own argument.

Keen presents some empirical data to support his argument. Fiebiger (2014) provides an adequate critique of this and all that remains to note is that the evidence cannot resolve the problems raised here, since they are not foremost of an empirical nature. One further issue is that Keen sees his analysis as closely related to the "credit impulse", a concept developed by Michael Biggs (see also Keen, 2011c). This is defined as "the change in new credit issued as a percentage of GDP" (Davies, 2008), and is found to be closely correlated with growth in demand and GDP in many instances (Biggs, Mayer, and Pick, 2010). It should be noted, however, that this concept is developed in the context of a *model* and no claim is made to the effect that it reflects a relationship which necessarily holds or that it contradicts existing economic accounting identities. In this respect, it must be clearly distinguished from Keen's analysis. Keen has since written a rejoinder in which he replies to Palley, Lavoie, and Fiebiger (Keen, forthcoming). This will be published in the October 2015 issue of the *ROKE*.

[28] It is true, however, that a given amount of financial savings in the form of *m* can finance a potentially infinite volume of transactions, provided that the "velocity of circulation" becomes large enough (Lindner, 2015; Stützel, 1979; Wicksell, 1936).

6. Summary and conclusion

This article has provided a critique of Steve Keen's argument that effective demand equals income plus the change in debt, drawing upon a framework of analysis derived from the work of Wolfgang Stützel. The framework was applied for the first time to this issue, in the context of an in-depth discussion of Keen's most recent restatement of this proposition (Keen, 2014a).

With regard to the substantive part of Keen's argument, we provided a balance mechanical analysis of the relationship between effective demand and changes in debt, arguing that there is no necessary relationship whatsoever between these variables. Specifically, we made a novel contribution in showing that Professor Keen's proposed relation does not hold under all circumstances, and that it holds in others mainly through the introduction of and variations in the 'velocity of debt'-variable. What is presented in Keen's paper hence does not prove his proposition, in that he does not succeed in deriving a relation which necessarily holds.

Professor Keen's velocity of debt variable, although necessary to (in most cases) prevent his equations from returning an incorrect result, lacks theoretical underpinning and thus its predictive and explanatory value is questionable. We also argued that Keen's redefinition of effective demand to include the purchase of financial assets does not appear fruitful since it severs the link between effective demand and aggregate income which is a key element of post-Keynesian economic analysis.

The debate around Keen's hypothesis has nevertheless raised interesting points. In particular, it would be desirable to obtain empirical evidence on the extent to which (if at all) different types of lending (for instance bank credit on the one hand and non-bank credit on the other, say for consumption or investment purposes) differ in their impacts upon demand and growth. Stockhammer and Wildauer (2015) also note a lack of empirical literature on such issues. However, the existing theoretical framework as well as existing economic accounting identities appear sufficient to accommodate any such evidence. In addition, the debate also serves as a reminder of the importance of definitional clarity in economic arguments and thus recommends the balance mechanics framework as a method to examine both existing and new theories to ensure internal consistency.

References

Albert, H. (2012): "Model Platonism: Neoclassical economic thought in critical light," *Journal of Institutional Economics*, 8(3), 295–323.

Allain, O., J. Hartwig, and M. Hayes (2013): "Effective Demand: Securing the Foundations - A Symposium," *Post-Keynesian Economics Study Group Working Paper No. 1302*.

Biggs, M., T. Mayer, and A. Pick (2010): "Credit and Economic Recovery: Demystifying Phoenix Miracles," *Working Paper*, available online:
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1595980

Davies, P. J. (2008): "'Impulse' measure of new credit is as a percentage of GDP," *Financial Times Online, 27th November*, available online:
www.ft.com/cms/s/0/6361b1d6-bc26-11dd-80e9-0000779fd18c.html

Dow, S. C. (1987): "Money and Regional Development," *Studies in Political Economy*, 23, 73–94.

Dow, S. C. (2006): "Endogenous Money: structuralist," in *A Handbook of Alternative Monetary Economics*, ed. by P. Arestis, and M. Sawyer, pp. 35–51. Edward Elgar, Cheltenham.

Edmonds, N. (2014a): "Palley on Keen, Demand and Debt," *Reflections on Monetary Economics*, Available online:
http://monetaryreflections.blogspot.co.uk/2014/04/palley-on-keen-demand-and-debt.html

Edmonds, N. (2014b): "Steve Keen Continues in the Wrong Direction," *Reflections on Monetary Economics*, Available online:
http://monetaryreflections.blogspot.co.uk/2014/02/steve-keen-continues-in-wrong-direction.html

Eurostat (2013): *European System of Accounts - ESA 2010*. Publications Office of the European Union, Luxembourg.

Fiebiger, B. (2014): "Bank credit, financial intermediation and the distribution of national income all matter to macroeconomics," *Review of Keynesian Economics*, 2(3), 292–311.

Flassbeck, H. (2001): "Gesamtwirtschaftliche Paradoxa und moderne Wirtschaftspolitik - Wolfgang Stützels Beitrag zu einer rationalen Ökonomie," in *Wolfgang Stützel: Moderne Konzepte für Finanzmärkte, Beschäftigung und Wirtschaftsverfassung*, ed. by H. Schmidt, E. Ketzel, and S. Prigge, pp. 409–426. Mohr Siebeck, Tübingen.

Flassbeck, H., and F. Spiecker (2011): "Der Staat als Schuldner - Quadratur des Bösen?," *Wirtschaftsdienst*, (7), 472–480.

Gardiner, G. W. (2004): "The Primacy of Trade Debts in the Development of Money," in *Credit and State Theories of Money - The Contributions of A. Mitchell Innes*, ed. by L. R. Wray, pp. 128–172. Edward Elgar, Cheltenham.

Godley, W. (1999): "Seven Unsustainable Processes - Medium-Term Prospects and Policies for the United States and the World," *Special Report, Levy Economics Institute*.

Godley, W., and M. Lavoie (2012): *Monetary Economics. An Integrated Approach to Credit, Money, Income, Production and Wealth. Second Edition*. Palgrave Macmillan, Basingstoke.

Hartwig, J. (2002): "Trying to Make Sense of the Principle of Effective Demand," *Conference Paper, 7th Annual CFEPS Post Keynesian Workshop*, available online:
http://www.cfeps.org/events/pk2002/confpapers/hartwig.pdf

Horn, G., and F. Lindner (2011): "Kein Kapitalabfluss aus Deutschland," *IMK Policy Brief*, May.

Kapeller, J., and B. Schütz (2012): "Debt, Boom, Bust: A Theory of Minsky-Veblen Cycles," *Johannes Kepler University of Linz - Department of Economics Working Paper No. 1214*.

Keen, S. (2009a): "Bailing out the Titanic with a Thimble," *Economic Analysis & Policy*, 39(1), 3–24.

Keen, S. (2009b): "The 'credit tsunami': explaining the inexplicable with debt and deleveraging," in *The Economic Crisis Reader*, ed. by G. Friedman, F. Moseley, and C. Sturr, pp. 44–51. Dollars & Sense, Boston, MA.

Keen, S. (2009c): "The Global Financial Crisis, Credit Crunches and Deleveraging," *Journal of Australian Political Economy*, 64, 22–36.

Keen, S. (2011a): *Debunking Economics - Revised and Expanded Edition: The Naked Emperor Dethroned?* Zed Books, London.

Keen, S. (2011b): "Debunking Macroeconomics," *Economic Analysis & Policy*, 41(3), 147–167.

Keen, S. (2011c): "Economic growth, asset markets and the credit accelerator," *Real-World Economics Review*, 57, 25–40.

Keen, S. (2011d): "Movement at the Station: Canadian Central Bank Governor Carney on the Age of Deleveraging," *Steve Keen's Debtwatch*, Available online:
http://www.debtdeflation.com/blogs/2011/12/19/

Keen, S. (2012a): "A Primer on Minsky," *EconoMonitor.com*, Available online: http://www.economonitor.com/blog/2012/03/a-primer-on-minsky/

Keen, S. (2012b): "Instability in Financial Markets: Sources and Remedies," *Institute for New Economic Thinking Berlin Conference Paper*, Available online: http://ineteconomics.org/conference/berlin/instability-financial-markets-sources-and-remedies

Keen, S. (2012c): "The Fiscal Cliff - Lessons from the 1930s," *Real-World Economics Review*, 62, 98–111.

Keen, S. (2013): "Predicting the 'Global Financial Crisis': Post-Keynesian Macroeconmics," *Economic Record*, 89(285), 228–254.

Keen, S. (2014a): "Endogenous money and effective demand," *Review of Keynesian Economics*, 2(3), 271–291.

Keen, S. (2014b): "How not to win an economic argument," *Real-World Economics Review Blog*, Available online: http://rwer.wordpress.com/2014/04/07/how-not-to-win-an-economic-argument/

Keen, S. (2014c): "Modeling Financial Instability," *Working Paper*, Available online: http://www.debtdeflation.com/blogs/wp-content/uploads/2014/02/Keen2014ModelingFinancialInstability.pdf

Keen, S. (2014d): "Some sample Minsky Models," Available online: http://www.debtdeflation.com/blogs/2014/01/15/

Keen, S. (forthcoming): "The Macroeconomics of Endogenous Money: A Reply to Fiebiger, Palley & Lavoie," *Review of Keynesian Economics*, 3(4).

Keynes, J. M. (1973): "A Monetary Theory of Production," in *The Collected Writings of John Maynard Keynes, Vol. XIII: The General Theory and After, Part I - Preparation*, ed. by D. Moggridge, pp. 408–411. Macmillan, Basingstoke.

Lavoie, M. (2006): "Endogenous Money: accommodationist," in *A Handbook of Alternative Monetary Economics*, ed. by P. Arestis, and M. Sawyer, pp. 17–34. Edward Elgar, Cheltenham.

Lavoie, M. (2009): "Towards a post-Keynesian consensus in macroeconomics: Reconciling the Cambridge and Wall Street views," in *Macroeconomic Policies on Shaky Foundations – Whither Mainstream Economics?*, ed. by E. Hein, T. Niechoj, and E. Stockhammer, pp. 75–99. Metropolis, Marburg.

Lavoie, M. (2014a): "A comment on 'Endogenous money and effective demand': a revolution or a step backwards?," *Review of Keynesian Economics*, 2(3), 321–332.

Lavoie, M. (2014b): *Post-Keynesian Economics - New Foundations*. Edward Elgar, Cheltenham.

Lindner, F. (2012): "Saving Does not Finance Investment: Accounting as an Indispensable Guide to Economic Theory," *IMK Working Paper*, (100).

Lindner, F. (2014): "Haben die knappen Weltersparnisse die US-Immobilienblase finanziert? Bemerkungen zur "Global Saving Glut"-These aus saldenmechanischer Sicht," *Wirtschaft und Gesellschaft*, 40(1), 27–54.

Lindner, F. (2015): "Does Saving Increase the Supply of Credit? A Critique of Loanable Funds Theory," *World Economic Review*, 4, 1–26.

Lindner, F., and S. Reissl (2015): "Balance Mechanics and Macroeconomic Paradoxes," *Manuscript*, to be presented at the 19th fmm-conference in Berlin, October 2015.

Mason, J. W. (2012): "The Case of Keen," *The Slack Wire*, Available online: http://slackwire.blogspot.de/2012/04/case-of-keen.html

McLeay, M., A. Radia, and T. Ryland (2014): "Money Creation in the Modern Economy," *Bank of England Quarterly Bulletin*, Q1.

Minsky, H. P. (1975/2008): *John Maynard Keynes*. McGraw Hill, New York.

Minsky, H. P. (1982): *Can "It" Happen Again? Essays on Instability and Finance*. M. E. Sharpe, New York.

Minsky, H. P. (1986/2008): *Stabilizing an Unstable Economy*. McGraw Hill, New York, NY.

Myrdal, G. (2005): *The Essential Gunnar Myrdal*. The New Press, New York.

Palley, T. I. (1992): "Beyond Endogenous Money, Toward Endogenous Finance," *Working Paper*, Available online: http://www.thomaspalley.com/docs/articles/macro_theory/endogenous_finance.pdf

Palley, T. I. (2014): "Effective demand, endogenous money, and debt: a Keynesian critique of Keen and an alternative theoretical framework," *Review of Keynesian Economics*, 2(3), 312–320.

Patinkin, D. (1958): "Liquidity Preference and Loanable Funds," *Economica*, 25(100), 300–318.

Schmidt, J. (2009): "Die Bedeutung der Saldenmechanik für die makroökonomische Theoriebildung," in *Keynes 2.0 - Perspektiven einer modernen keynesianischen Wirtschaftstheorie und Wirtschaftspolitik*, ed. by H. Hagemann, and H. Krämer, pp. 111–148. Metropolis, Marburg.

Schmidt, J. (2012): "Sparen - Fluch oder Segen? Anmerkungen zu einem alten Problem aus Sicht der Saldenmechanik," in *Normative und institutionelle Grundfragen der Ökonomik*, ed. By M. Held, G. Kubon-Gilke, and R. Sturn, pp. 61–85. Metropolis, Marburg.

Shackle, G. L. S. (1965): *A Scheme of Economic Theory*. Cambridge University Press, London.

Stockhammer, E., and J. Michell (2014): "Pseudo-Goodwin Cycles in a Minsky Model," *Post-Keynesian Economics Study Group Working Paper No. 1405*.

Stockhammer, E., and R. Wildauer (2015): "Debt-driven Growth? Wealth, Distribution and Demand in OECD Countries," *Kingston University London Economics Discussion Papers*, 2.

Stützel, W. (1978): *Volkswirtschaftliche Saldenmechanik*. Mohr Siebeck, Tübingen, 2nd edn.

Stützel, W. (1979): *Paradoxa der Geld- und Konkurrenzwirtschaft*. Scientia Verlag, Aalen.

Stützel, W., and W. D. Grass (1988): *Volkswirtschaftslehre. Eine Einführung für Fachfremde*. Franz Vahlen, Munich, 2nd edn.

Tymoigne, E., and L. R. Wray (2006): "Money: an alternative story," in *A Handbook of Alternative Monetary Economics*, ed. by P. Arestis, and M. Sawyer, pp. 1–16. Edward Elgar, Cheltenham.

Vijayaraghavan Ramanan (2012): "Income ≠ Expenditure?," *The Case for Concerted Action*, Available online: http://www.concertedaction.com/2012/10/06/is-income-not-equal-to-expenditure/

Vijayaraghavan Ramanan (2014): "Keen's Reply To Palley," *The Case for Concerted Action*, Available online: http://www.concertedaction.com/2014/04/08/keens-reply-to-palley/

Wicksell, K. (1936): *Interest and Prices*. MacMillan, London.

Wray, L. R. (1999): "The Development and Reform of the Modern International Monetary System," in *Foundations of International Economics: Post-Keynesian Perspectives*, ed. by J. Deprez, and J. T. Harvey, pp. 171–199. Routledge, London.

Author contact: severin.reissl@googlemail.com

SUGGESTED CITATION:

Severin Reissl, "A critique of Keen on effective demand and changes in debt", *real-world economics review*, issue no. 72, 30 September 2015, pp. 96-117, http://www.paecon.net/PAEReview/issue72/Reissl72.pdf