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## **The Macroeconomics and Financial System Requirements for a Sustainable Future**

**Giuseppe Fontana, University of Leeds, UK, and University of Sannio, Italy**

**Malcolm Sawyer, University of Leeds, UK**

The paper develops a macro-economic analysis along broadly defined Post Keynesian and Kaleckian lines, which incorporates ecological constraints on the pace of economic growth. Since growth is viewed as demand-driven, this involves bringing demand into line with the sustainable 'ecological footprint'. A simple model of demand-driven growth is constructed from which some basic conclusions are drawn of the consequences of slower growth and lower investment including those for the rate of interest and the rate of profit. The macroeconomic policy to deliver full employment is indicated. The growth of the effective labour force and the sustainable rate of growth of the 'ecological footprint' are introduced and the relationships between them and the demand-driven rate of growth explored. The macroeconomic analysis has to be embedded with analysis of the monetary and financial system. For this purpose a circuitist analysis is presented. The paper considers the ways in which the monetary and financial systems should be re-structured to be consistent with sustainable growth and low unemployment. The major aims of this re-structuring would be to underpin financial stability, and more importantly to focus the financial sector on the allocation of funds into environmentally friendly investment.

**Key words:** ecological macroeconomics, sustainability, financial systems, ecological footprint

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**JEL Classification:** E00, G20, O11, O44

## 1. **A Post Keynesian cum Kaleckian macroeconomic analysis for a sustainable economy<sup>1</sup>**

This paper seeks to set out a macroeconomic analysis of an environmentally friendly and sustainable economy. There has surprisingly been relatively little attention paid to the macro ecological economics: the pages of *Ecological Economics*, for example, contain rather little on macroeconomics, and with even less from a non-mainstream approach. Texts such as that by Hahnel (2011), entitled *Green Economics*, which provides a pluralist approach makes no reference to macroeconomic and financial issues; similarly Perry (2013), written from a post Keynesian perspective, does not go much beyond a recognition that the separation between monetary and real sectors does not hold. Jackson (2009) does contain some macroeconomic analysis but does not work through the macroeconomic implications of slower growth, nor is money or finance involved in any significant manner. There has been (as there must be) a macroeconomic analysis embedded in the formal modelling as, for example, in the E3MG model which is discussed in Anger and Barker (2014), though often the demand-side is played down and little, if any, attention is given to money and finance. Any macroeconomic analysis of market-based economies must contain (implicit or explicit) views of how such economies work. What are the key factors underlying the growth of economies? What are the determinants of the level of unemployment and are there market tendencies towards full employment? Arestis and González Martínez (2014) consider and then dismiss an approach based on what may be termed the mainstream macroeconomics of the new consensus in macroeconomics and the dynamic stochastic general equilibrium (DSGE) approach.<sup>2</sup> Such approaches incorporating ‘rational expectations’ on the future, ignoring fundamental uncertainty and path dependency and reliance on equilibrium analysis means there are unsuitable for an ecological macroeconomic analysis. In contrast, our analysis offers a post Keynesian-cum-Kaleckian approach (PKK hereafter) to ecological macroeconomics which recognizes the demand-led nature of capitalism and the crucial roles of money and finance. . It responds to

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<sup>1</sup> This paper draws on work undertaken for the EU-funded project Financialisation Economy Society and Sustainable Development (web-site:fessud.eu) project number 266800. The views expressed should not be taken to reflect either the views of the European Union or the partners in the FESSUD project.

<sup>2</sup> We avoid discussion as to whether DSGE warrants the term macroeconomics given its heavy reliance on the ‘representative agent’. Such models are though routinely used in Central Banks and elsewhere.

the recent call of offering new narratives in ecological economics. “Mainstream economics is the main ruler, and thus both pro-growth and no-growth can be considered alternative discourses trying to change the reproduction of meaning exercised in business as usual. For this purpose, strong new narratives are required” (Urhammer and Røpke, 2013, p. 67).

One of the key features of the PKK approach<sup>3</sup> is that the world is characterised by fundamental uncertainty rather than risk. The term ‘uncertainty’ is used here in the Knightian/Keynesian sense. This is readily expressed by Keynes (1937a). “By, uncertain knowledge, let me explain, I do not mean merely to distinguish what is known for certain what is only probable. The game of roulette is not subject, in this sense, to uncertainty; nor is the prospect of a Victory bond being drawn.... The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know” (Keynes, 1937a, pp. 213-214).

This notion of ‘uncertainty’ can be contrasted with that of ‘risk’ where the future is in a sense known up to a probability distribution. The future is then akin to the roll of a die – we know what the range of possible outcomes is (here 1 through 6), what the probability of each outcome is (one-sixth in this example), though we do not know which of one through 6 will result in the roll of a die, though we know that the expected outcome (in a statistical sense) is 3.5, and that a large number of rolls of the die would lead to an average outcome close to 3.5. The ‘fundamental uncertainty’ view of the world has two sets of implications relevant for our analysis. First, it is not relevant to model the decisions and actions of individuals (people, organisations etc.) as though they result from optimisation, whether it is the maximisation of profits, of utility subject to a budget (or other) constraint. Optimisation is not feasible, whether through lack of knowledge, lack of computing power or through the unknowability of the future.

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<sup>3</sup> See Sawyer (2009) for what one of us sees as the core propositions of heterodox macroeconomics, which here is referred to as PKK macroeconomics.

Second, there is path dependency – that is the future path of the economy (and society more generally) builds on decisions made in the present, and there is not some equilibrium path of the economy already set to which the economy is predestined to follow. To state the obvious, the effects of climate change and the degree to which it is resulting from human behaviour are unknown. It is not possible to draw on past experience etc. to fully predict the future for the simple reason that the future will be different from the past. Further, the economy is viewed in terms of path dependency where current actions and decisions lay down the conditions for the future path of the economy.<sup>4</sup>

Another key feature of post Keynesian-cum-Kaleckian macroeconomic analysis is that the level and composition of economic activity, and its growth, are demand-determined (Fontana and Palacio Vera, 2007; Fontana, 2010). There are supply aspects and constraints on the level of economic activity and employment which have to be explored. But the key driver is the aggregate demand for goods and services, and within aggregate demand investment expenditure is the key element. Our approach stands in contrast with most writings on sustainability which are embedded in a purely supply-side approach. “The conceptual framework used by economists to describe long-term growth still refers to the one proposed by Robert Solow in the late 1950s: long-term productivity is sustained by technological progress” (Chancel, Demailly Waisman, Guivarch, 2013, p. 11) is, for example, drawn on in their study of sustainable growth. In our analysis, aggregate demand matters in both the short-run and in the long-run.<sup>5</sup> Unemployment and underemployment of labour have been pervasive features of capitalist economies, and the level of economic activity is not generally constrained by the availability of labour.

However, supply-side considerations are often relevant. First, there are often shortages of productive capacity such that even if there were higher demand there would not be much increase in employment of labour: this may express itself in an inflation barrier (cf. Arestis and Sawyer, 2006). There are sectoral imbalances such that there can be inadequate productive capacity in specific

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<sup>4</sup> See Arestis and Sawyer (2009) for a volume of essays exploring the economics of path dependency, and Sawyer (2011) on significance of path dependency within macroeconomics.

<sup>5</sup> See Setterfield (2002, 2009) for volumes of essays on demand-driven growth.

sectors (as has been highlighted in parts of the structuralist literature, see for example, Palma and Pincus, 1994). It would also be acknowledged that (from path dependency) the state of productive capacity depends on the path of demand: the levels of demand and profitability influence investment, which adds to the capital stock and productive capacity.

Second, and of particular and central relevance here, production draws on 'natural capital' and the depletion of natural resources. Thus output, and more particularly the growth of output, becomes in effect constrained from the supply-side of the economy. However, such constraints do not immediately 'bite' in that output and the growth of output (driven by demand) can exceed what is sustainable in terms of the depletion of 'natural capital' and effects of the 'ecological footprint'. The excessive use of what some would label 'natural capital' will eventually bring growth to a grinding halt. We prefer the formulation in terms of the 'ecological footprint', and the unsustainabilities which arise from the forms, level and rate of growth of economic.

Over the long haul, the growth of demand, the growth of the effective labour force and the growth of the use of natural capital have to be broadly in balance. The absence of balance between the first two growth rates would involve rising or falling unemployment. A lack of balance between the first and third growth rates would spell environmental disaster as the 'ecological footprint' grows in an unsustainable manner. In Fontana and Sawyer (2012) we have explored some aspects of how the balance between the different growth paths could be brought about, stressing that there are market mechanisms cannot be relied upon to do so.

A further feature of PKK macroeconomic analysis is the explicit acknowledgment of the essential role played by money, banks and financial markets in modern capitalist economies, that is the necessity to replace the so-called 'classical dichotomy' with an analysis of the integration between the monetary and real sides of the economy. It is the study of a monetary production economy in which the creation and use of money plays a vital role. Expenditure cannot be undertaken unless it can be financed, and the ways in which the banking system supplies loans (and thereby creates money) and the ways in which savings are channelled into investment are crucial for the evolution of the economy. Thus we concur with Daly when he writes that "money and finance have rather naturally

been pushed aside by ecological economists' focus on biophysical dimensions. But money is far more than just a 'veil'—an assumption of mainstream economics that ecological economists too often share". (Daly, 2014 in his review of Roberts, 2013, p. 1)

There has been relatively little attention given to macroeconomic environmental issues within explicitly post Keynesian and Kaleckian frameworks, though many of the features of these analyses are consistent with much of the writings under the heading of ecological economics. There are though writings on environmental economics within the post Keynesian framework<sup>6</sup> -- for recent review see Perry (2013), Winnett (2012), Holt and Spash (2009), Holt (2014). As Perry (2013) acknowledges "with its focus on growth, development, and effective demand, post-Keynesian economics has been criticized as being subject to the same 'growthmania' as the neoclassical school" (Daly 2007, p. 26). We would, though, argue that effective demand is an essential component in the analysis of the level of economic activity and growth, and hence it has to be considered and understood. Thus, post-Keynesian environmental economists utilize post-Keynesian principles and models and develop them to account for environmental impact of production, improve the management of environmental resources, and shift economies to more sustainable growth paths while maintaining a focus on full employment, growth, demand management, and income distribution' (Perry, 2013, p. 391). Although post Keynesian and Kaleckian economic analyses have had a strong macroeconomics focus,<sup>7</sup> and within that focus one which stresses the role of demand in the determination of the level of economic activity in the short-run and the long-run, and that the economy is a monetary production one in which there is not a separation between the monetary,

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<sup>6</sup> The term environmental economics is used in for example title of Perry (2013), though Holt, Pressman, and Spash (2009), bring together Post Keynesian and Ecological Economics. Given the distinction which is often drawn between environmental economics and ecological economics (see, for example, Roehrl, 2012), it would be more appropriate to use the term ecological economics.

<sup>7</sup> As a glance through King (2012) and Harcourt and Kriesler (2013) would illustrate, post Keynesian economics covers the full range; nevertheless we would suggest that the point made in the text in terms of relative importance is valid.

financial and real, there has been little writing which has developed the macroeconomic analysis of slower growth nor has placed that analysis within an endogenous money setting in which the analysis of the financial sector and its role are taken seriously.<sup>8</sup>

The paper now proceeds as follows. In section 2, we begin by in effect repeating some well-known post Keynesian cum Kaleckian macroeconomic analysis and drawing out its relevance for a slowly growing economy. It is specifically argued that slower growth has to be accompanied by lower rates of profit and of interest than hitherto during the post-war world. But it is also argued that full employment of labour should be a key objective of economic policy and that is achievable under slower growth with the right fiscal policies. In section 3, we consider the relationship between the evolution of supply and that of demand, and specifically the ways in which eventually there has to be adjustments between demand and supply, but specifically in the context of environmental concerns the growth of demand has to be brought in line with the environmentally sustainable rate of growth which depends on the sustainable use of 'natural capital'. Section 4 provides a portrayal of the financial system from a circuitist perspective. Finally section 5 relates to the design of the financial system which is sustainable and which underpins a sustainable pattern of development.

## **2. The simple macroeconomics of slower growth**

### **2.1 A very basic model**

The macroeconomic analysis, which is worked out here, largely relates to a closed economy. This is not because we consider open economy considerations are in any sense unimportant. But since one country's exports are another country's imports, the net export positions of countries have to average out to zero, and particularly from a demand perspective it is net exports which are relevant, then our analysis could be treated as applying to the 'average' country. An alternative interpretation of what we do is that

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<sup>8</sup> In contrast with, for example, 'For simplicity it is assumed that the Bank of Canada, Canada's central bank regulates the money supply to keep inflation at or near the target level of 2 per cent per year' (Victor, 2008b) (quoted in Jackson, 2009). In modelling it is inevitable that assumptions have to be made which are simplified particularly where they are judged to be rather peripheral to the key aspects to be explored (Victor, 2008b, *Redefining Prosperity*).



our analysis applies to the global economy which is a closed economy, and hence there is no external trade sector. One shortcoming of using a closed economy approach is that no consideration can be given to spill-over effects of one country's pollution and ecological footprints on other countries. For the present paper, this would mean that the difficulties of ensuring that the 'ecological footprint' is at a sustainable level are greater than may be envisaged from the paper in the sense that the 'ecological footprint' is essentially a global rather than national construct.

The analysis relates to the level and growth of a modified version of gross domestic product (GDP). It is modified in that production, which is excluded from the present measures of GDP and which are using (unpaid) labour time, capital equipment and of particular significance here 'natural capital' should be considered as included. Thus household production should be included as part of material GDP.

Gross domestic product must not be viewed as a good proxy for social well-being; and it is not even a particularly good measure of material well-being. Instead GDP should be regarded as a measure of output, which draws on the factors of production including 'natural capital' (or alternatively expressed leaves an 'ecological footprint'), and as such depletes 'natural capital'. The output may be useful or wasteful, and people will have differing views on which output is useful and which wasteful – armaments and military expenditure being notable examples. Other parts of GDP may be necessary for production but not in themselves of benefit – transport to work would be a good example.

The working assumption is that future economic growth (of modified GDP) will need to be lower than in the past decades (notably the period since WWII) for reasons of environmental sustainability. "Throughout the 21st century, climate-change impacts are projected to slow down economic growth, make poverty reduction more difficult, further erode food security, and prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger," the report declared" The report from the UN's intergovernmental panel on climate change (IPPC) <http://www.ipcc.ch/> (Available at: <http://www.nytimes.com/2014/03/31/science/earth/panels-warning-on-climate-risk-worst-is-yet-to->

[come.html?emc=edit th 20140331&nl=todaysheadlines&nid=23626325& r=0:](#) A crucial question here is what the order of magnitude of that reduction in growth rate would be. Some (including IPCC) have viewed output being lower than otherwise in a few decades time, but that translated into lower growth of one or two tenths of a per cent. Others (e.g. Piketty, 2014) view slower growth, perhaps of the order of 1 to 1 ½ per cent per annum for industrialised economies, though this may come more through limits on the speed of technical change. Anger and Barker (2014) suggest a growth rate for the world over the period to 2050 of the order of 2.5 per cent per annum. Others such as those in the Centre for the Advancement of the Steady State Economy, Dietz and O'Neill (2013), Victor (2008a, 2008b) would place the sustainable rate of economic growth at zero (or less). Chancel et al. (2013) postulate a growth rate of between 0 and 1 per cent per annum, and also discuss the general slowdown of economic growth over the past decades in industrialised economies. The severity of the required reduction in the pace of economic growth is, not surprisingly, widely disputed, and here we can only indicate the implication of slower growth in macroeconomic terms, though the quantitative significance is of great importance.

First, let us consider some of the macroeconomic implications of a slower (than in the past few decades) rate of growth. From our PPK perspective, our starting point is the relationship between savings and investment.

We label  $g$  as the rate of growth of capacity output ( $DY^*/Y^*$ ), where  $D$  denotes change and  $Y^*$  is capacity output, and for convenience here treat population growth as zero. Investment is labelled  $I$ , private savings  $S$ , and budget deficit  $BD$  (equal government expenditure minus tax revenue). In a closed economy with a government, the national income accounts identity provides:

$$(1) \quad S = I + BD$$

Investment is treated as related to the growth of capacity output and depreciation, i.e.

$$(2) \quad I = (vDY^* + dK)$$

where  $v$  is capital-capacity output ratio is treated as constant with respect to relative prices and the like though it may shift as technology changes<sup>9</sup>. Depreciation on existing capital stock is given by  $dK$ .

Treating gross savings as arising from income with net savings being a proportion  $s$  of income and hence gross savings =  $sY + dK$ , with an autonomous component of consumer expenditure and budget deficit taken as proportional to income, i.e.  $b.Y$ , then

$$(3) \quad sY + d.v.Y^* = vDY^* + d.v.Y^* + b.Y, \text{ and}$$

$$(4) \quad (s-b).u = v.g$$

where  $g$  is the growth of capacity output.

This solves to give  $g = (s - b).u/v$ , which in the absence of a budget deficit and capacity utilisation of 1 would give the result  $g = s/v$ : a well-known formula corresponding to Harrod's warranted rate of growth (and the same formula comes from the Solow neo-classical growth model, albeit with the growth rate equal to the 'natural' rate of growth and  $v$  being a variable which adjusts). Slower growth arising from supply-side constraints would translate into lower rates of capacity utilisation, unless offset by a larger budget deficit. A lower growth rate then implies some combination of lower savings propensity, higher budget deficit, and higher capital-output ratio. This is an algebraic relationship relating to the conditions for steady growth: it does not tell us whether such a growth rate will be achieved, or whether actual investment behaviour, for example, would be consistent with this growth rate. It is also known from the Harrod based literature that the warranted growth rate may be somewhat unstable.<sup>10</sup>

At a point in time, lower investment, lower budget deficit and lower autonomous component of consumption would result in lower level of economic activity, income and thereby employment (when employment is treated as proportional to output). This provides

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<sup>9</sup> The constant capital-output ratio is a reflection of a more general assumption of a 'fixed factor proportions', which means that there is no direct substitutability between the resources used, in clear contrast to the use of production functions such as the Cobb-Douglas function in neo-classical economics. Here we draw on what Kaldor (1956) referred to as one of the 'stylised facts' of modern economies, the relationship between capital stock and capacity output is constant.

<sup>10</sup> Harrod (1939) raised this knife-edge question; see, also, Palley (2012) for a recent discussion on possible resolution of the knife-edge problem.

a first and simple proposition: a lower rate of growth would require some combination of lower savings, higher budget deficit or lower capital-output ratio to maintain a specified level of capacity utilisation. In a similar vein, when employment is directly related with output, then a high rate of employment requires corresponding changes in savings and budget deficit.

There is little reason to think that the changes in savings rate and the capital-output ratio which would be required to maintain employment levels would come about through market processes. It is a somewhat paradoxical result that lower growth could involve a higher ratio of consumer expenditure (lower savings) to output: but the rationale is simply that lower growth involves lower investment ratio and hence higher consumer expenditure. Useful consumption could be higher as resources, which are not recorded as investment but whose use is related with growth, are released for other uses – notably examples being those related to marketing and advertising.

It is being assumed here that the capital-(capacity) output is constant. Specifically it is being asserted that the capital-output ratio is largely technically determined and is not significantly influenced by relative prices (of capital equipment and labour). However, as technology and the composition of output changes, the capital-output ratio would be affected. There are likely competing influences in operation here. Renewable energy may well, for example, be more capital-intensive than non-renewable energy (though of course the latter uses up the resources of oil, gas, coal etc., whereas the former does not). However shift to labour-insensitive services would tend to lower the capital-output ratio.

The implications for budget deficits are straightforward. In the face of ecological concerns, it becomes more imperative for countries to adopt relevant fiscal policies (i.e. substantial budget deficits in most cases) and not seek to lock themselves into the pursuit of balanced budgets. The budget deficit is the overall budget position, i.e. primary budget position and interest payments on the government debt. It is well-known that such a deficit position (relative to GDP) will lead the outstanding debt converging on a ratio to GDP of  $b/(g + p)$  where  $b$  is the budget deficit ratio to GDP,  $g$  (real) growth rate and  $p$  rate of inflation. The budget deficit is, of course, the difference between government expenditure and tax revenues. It could be anticipated that slower growth would lead to

lower requirements for public investment, and in so far as higher budget deficit involves higher expenditure rather than lower tax revenues, this would involve a rise in consumption expenditure albeit undertaken by the government.

In a zero growth case, (assuming no population growth and no inflation), then net national savings would fall to zero along with investment. But private savings  $S =$  budget deficit, and hence  $S + T = G$ . Government expenditure is funded by tax revenue plus savings, and savings can in effect only take the form of purchase of government bonds. The question then arises as to why savings are occurring. From a life-cycle perspective, savings would be undertaken to shift spending over life cycle; but with static growth (and population) then those who are saving (for retirement) would be matched by those who are dissaving. (The alternative is a social security system whereby there are rights to a retirement pension and those rights are gained through payment of social security contributions during working life). The stock of government debt required would equal to the sum of pension obligations.

From the simple equations given above we have to branch out in three directions. The first is to put some 'flesh' on the determinants of investment and as a result we focus on the roles of profits and capacity utilisation, as well as savings and the role of profits. The second (in a subsequent section) is to bring supply into the picture, and specifically the use of 'natural capital'. The third arises from the need to consider the financial sector. In this section we are implicitly assuming that investment can secure finance (in the form of loans), the investment is then undertaken and as a result savings are generated: the savings are (in ways to be examined below<sup>11</sup>) in effect reallocated to fund the investment.

## **2.2 Income distribution and the rate of profit**

The PKK macroeconomic analysis has emphasised the role of the distribution of income between wages and profits for aggregate demand, the significance of profits for investment and developed links between the rate of growth and the rate of profit. We now indicate the significance of that for when growth is slower than hitherto.

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<sup>11</sup> But see Sawyer (2013), Passarella Veronese and Sawyer (2014) further on this.

The basis of the model is that consumer expenditure is treated as rather passive in the sense that it follows the path of wages and profits. In the context of ecological concerns, this may understate the materialistic drives behind consumption, and that lower growth necessarily involves lower growth of consumption, though as indicated above a higher proportion of output going to consumption. Savings are treated in terms of differential savings out of wages and out of profits. This reflects the view that wages and profits have different functions. Wages are a payment for labour, and through various social norms the vast bulk of wages are spent on consumption. At the individual level, there will be savings out of wages for life-cycle reasons, but that turns into pensions which are largely spent, and for the individual worker over their life time wages are largely spent. At the aggregate level, the dissaving by retired workers largely offset saving by active workers, leaving over-all savings out of wages close to zero. Profits accrue to corporations, a high proportion of which is saved (retained earnings). Thus consider the savings out of profits to be substantially greater than savings out of wages.<sup>12</sup> Some rather simple but powerful conclusions can be derived from a model based on these propositions.

In a closed private sector economy, from the savings-investment equation, with differential savings out of wages (W) and out of profits (P):

$$(5) I = s_p P + s_w W,$$

with investment treated as the driving force, the rate of profit would be given by:

$$(6) P/K = [g_K - (s_w u/v)]/[s_p - s_w]$$

where  $g_K$  is growth of capital stock equal to  $I/K$ , and  $u$  is capacity utilisation and  $v$  capital-output ratio (hence  $u/v = Y/K$ ). With the 'classical savings function' of no savings out of wages, this equation reduces to the 'Cambridge equation' of  $g_K = s_p \cdot \text{rate of profit}$ . The particular significance of this type of equation is the implication that a lower growth rate (of capital stock) will be associated with a lower rate of profit. Ecological constraints will lead to lower growth of output and the capital stock, thereby implying a lower rate of

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<sup>12</sup> In Fontana, Rodriguez and Sawyer (2014) we introduce the financial sector as rentier and explore some similar issues.

profit. The rate of profit would though be enhanced through lower savings and through a budget deficit when the model is extended to include government expenditure and tax revenue.

In a slower growth regime, we would argue that full employment should remain a desired objective of economic and social policy (though we should say becomes a key objective as it has not seriously been pursued as an objective for many years). The general notion of full employment would remain, namely a position where the number without work is equal to the number of vacancies (and no significant long-term unemployment). But here work should be interpreted to include work outside the labour market as well as paid work in the labour market. The concepts of what constitutes employment and what unemployment need much greater attention than we can give here. Nevertheless the essential point is that the re-organisation of the economy alongside appropriate macroeconomic policies are required to ensure that sustainable growth at a slower rate does not lead to substantial unemployment and degradation of individuals. Further, the hours worked (in terms of annual hours and length of working life) would be adjusted so that in effect higher labour productivity is taken in terms of working time reduction rather than higher output. This would help with work/life balance and also enable work to be spread more evenly rather than many working long hours and others having no work at all.

### **2.3 Rate of interest and rate of growth**

The relationship between the rates of interest and of profit with the rate of growth is significant in a range of ways, and the general argument here is that the rates of interest and of profit will be lower when the rate of growth is lower. In a recent book Piketty (2014) has placed central importance on the implications of the excess of the rate of return on wealth over the rate of growth for the evolution of inequality of wealth and the wealth to income ratio. Put simply, wealth can increase at the pace of the rate of return on wealth if the propensity to save out of rentier income is unity; and more generally wealth can increase faster than income if  $s.r > g$  where  $s$  is propensity to save out of rentier income. A substantial gap between growth rate and of return on wealth (Piketty, 2014, uses orders of magnitude of 1 to 1 ½ per cent and 4 to 5 per cent [need to check figures) will lead to rising wealth to income

ratio and rising inequality of wealth (when Piketty, 2014, argues that the rate of return on large wealth will tend to be greater than the rate of return on small wealth). This highlights the possible significance of the rate of return—rate of growth relationship, though we would argue that Piketty (op. cit.) is only examining the savings side and not investment side (see Sawyer, 2014c for further discussion).

An alternative perspective comes from consideration of equation (6) above, where the rate of profit is related with the rate of growth (and the relative propensities to save out of wages and profits). The adjustment of the rate of profit to a lower rate of growth could come through some combination of changes in savings behaviour, in the capital-output ratio, and in average capacity utilisation. But in the event that those variables remain unchanged, lower growth would imply a lower rate of profit. This is an equilibrium condition, and there may be little to think that the adjustment to a new equilibrium would be smooth.

For the rate of interest there are a range of arguments, which suggest that the rate of interest and the rate of growth either should or generally are closely aligned. By the rate of interest here we mean the risk-free lending rate as reflected in the rate of interest on government bonds. Here, unless stated otherwise, it is the real rate of interest which is being discussed. It can be first noted that Taylor's (1993) original rule for setting the interest rate, "the 2-percent 'equilibrium' real rate is close to the assumed steady-state growth rate of 2.2 percent" (p. 202). The 'golden rule of capital accumulation' in the framework of a neoclassical model with the marginal productivity of capital equal to the interest rate generates such an outcome. Another is the 'fair rate of interest' (Pasinetti, 1981), which "in real terms should be equal to the rate of increase in the productivity of the total amount of labor that is required, directly or indirectly, to produce consumption goods and to increase productive capacity" (Lavoie and Seccareccia, 1999, p. 544).

The setting of the interest rate has some clear and obvious implications for fiscal policy. The sustainability of a budget deficit depends on the level of interest rates (and specifically the post-tax interest rate on government bonds,  $rt$ ). If that rate is less than the growth rate, then any primary budget deficit of  $d$  (relative to GDP) would lead to an eventual debt ratio (to GDP) of  $b = d/(g - rt)$  (where  $g$  and  $rt$  are either both in real terms or both in nominal terms). If  $rt > g$  then a primary budget deficit would lead to a growing



debt ratio. In a similar vein, a continuing total budget deficit of  $d$  (including interest payments) leads to the debt to GDP ratio stabilising at  $d'/g$  where here  $g$  is in nominal terms. This implies that  $b + rd = gd$ , i.e.,  $b = (g - r)d$  and hence if  $g$  is less than  $r$  the primary budget deficit is negative (i.e., the primary budget is in surplus). The case where  $g = r$  is of particular interest. Pasinetti (1997, p. 163) remarks that this case represents the 'golden rule' of capital accumulation. In this case, the public budget can be permanently in deficit and the public debt can thereby increase indefinitely, but national income increases at the same rate ( $g$ ) so that the  $D/Y$  ratio remains constant. Another way of looking at this case is to say that the government budget has a deficit, which is wholly due to interest payments.

The implication here is that an aim of monetary policy is to ensure a low rate of interest on government bonds, and specifically one which is at or below the rate of growth: hence a growth rate of 1 per cent should be accompanied by the real rate of interest on government bonds of less than 1 per cent.

#### **2.4 The determinants of investment**

In the PKK approach, investment is the driver of demand, though it is also the link between the present and the future in the sense that investment adds to the capital stock and productive capacity. Investment is then treated as closely related with growth: it is the prospect of growth (and profits) which drives investment – in the absence of growth why would be requirements for additions to the net capital stock? And it is the investment which makes growth possible through an expansion of the capital stock. Consumer expenditure is, of course, a large component of demand (circa 65 per cent), though it is not as volatile as investment; and has a passive element to it – that is consumer expenditure responds to income – an argument, which has to be modified for the rise of consumer debt. But availability of consumer debt may raise the propensity to consume (and hence lower propensity to save by households), but cannot continuously raise that propensity. A lower growth of economic activity would require a lower rate of investment, and the prospects of lower growth help to induce lower rate of investment.

In the post Keynesian cum Kaleckian perspective, investment is strongly influenced by the rate of capacity utilisation (relative to some 'desired' rate of capacity utilisation), changes in capacity (a la accelerator) and profitability (with profits seen as a source of internal funds and future profits as incentive for investment) and a range of factors including the state of 'animal spirits', the impact of technological opportunities, and credit conditions. Investment decisions cannot arise from optimisation in an uncertain path dependent world (as is evident in the quote from Keynes, 1937 given above). Capacity utilisation and profitability are viewed as the type of economic variables which corporations based their investment decisions on. The term 'animal spirits' can be interpreted in a number of ways; in the *General Theory* Keynes apparently uses the term to indicate the unconscious mental action that drives entrepreneurs to make investments in a world of fundamental uncertainty. "Even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than mathematical expectations, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as the result of animal spirits—a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities" (Keynes, 1936, pp. 161-162). Of particular significance here is the general view of the future which corporations take. If, for example, there was a general view that growth in the future was to be lower than previously say through sustainability considerations, then investment will be down; and there is a strong element here of self-fulfilment – lower growth expectations leads to lower investment, leads to lower growth. And as we have indicated before credit conditions (and specifically availability of loans) are significant in the translation of investment decisions into practice. This means that it is also important the general view of the future which banks and financial markets take. In other words, the structure of investment depends on the lending activity of banks and financial institutions as well as on the public policy regulating bank lending and financial activities. All of these factors are affected, among other things, by animal spirits. As a result, some forms of desired

investment may not come into existence. Similarly, some groups of individuals may be favoured over others in terms of direct access to credit and/or differential interest rates.

The neo-classical model of economic growth, which has been maintained in the endogenous growth theory, does not contain an independent investment function, and savings behaviour sets capital formation.<sup>13</sup> Thus it pays little attention to investment, but yet the neo-classical growth model has often been drawn upon in the ecological economics literature. In the PKK literature with investment as the driving force, measures will be needed to not only change the composition of investment in an environmental friendly direction, but also to constrain levels of investment in a way to be consistent with slower growth. It will no longer be “Accumulate, accumulate, that is the law of Moses and the prophets” [Marx, 1887 (orig. 1867), Vol. 1, Ch. 24, p. 412] that is driving the economy. In a number of respects the stress within PKK macroeconomics on the importance of investment provides a range of insights in the context of environmental considerations. Put simply, mechanisms have to be put in place which will lead to lower investment and policies to deal with the consequences.

A stronger statement of this is given by Devine (2014) when he writes that “the argument of this chapter is that the underlying cause of this unhappy and intolerable state of affairs is the capitalist system itself, with its fundamental dynamic of endless growth based on the ruthless exploitation of both labour and non-human nature. Policies to deal with the dysfunctional consequences of capitalism are like to policies to treat the symptoms of illness; they are certainly worth having, but they should not be allowed to divert attention away from the need to get rid of the illness and prevent it from occurring in the first place” (pp. 169-170). Looking at the PKK style investment function could point to the importance of ‘animal spirits’. On the one hand ‘animal spirits’ could be seen in terms of the drive to do something. On the other hand, ‘animal spirits’ could be seen in terms of the ‘state of confidence’ in the future and the state of expectations on future growth. As the prospects for future sustainable growth become less favourable, the drive to invest would diminish.

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<sup>13</sup> The neo-classical model dates from Solow (1956). For text on endogenous growth see Barro and Sala-i-Martin (2004).

In a perspective where growth is viewed as demand-driven, and demand is investment-driven, much depends on the drive to invest. But what would seem clear is that there has to be some reductions in the drive to invest, though how much is a matter of great debate. As an aside here we would argue, as we come back to below, that there has to be redirection of investment as well.

## 2.5 Savings and pensions

Savings are undertaken by households and by firms; households saving viewed as geared towards life cycle: note in a zero growth economy, there would no net savings by household as retired population dissave equal to working population savings. In a growing economy, firms have retained earnings for investment purposes (usually). In order to save, households have to acquire financial assets which include equity in companies. How is saving propensity via life cycle hypothesis linked with growth?

The payment of pensions can be viewed in terms of a transfer of spending power from those in employment (and more generally of working age) to those who are now retired. The transfer of spending power can be effected through a variety of routes – the three generally cited would be through support within the family setting for the retired, a (unfunded) social security system which levies taxes and social security contributions on those of working age and pays pensions to the retired, and a funded schemes in which those of working age forego consumption in the present (through contributions to pension funds) enabling those in retirement to dis-save through pension payments.

A crude example: in a steady state (with unchanging demographics) economy growing in per capita terms at  $g$  and a rate of return (interest) on savings of  $r$ . People spend on average  $T_1$  years being of working age, and an average of  $T_2$  years being retired. In a social security system, a balanced pension scheme would require that the tax rate on working age population  $t$  be set such that  $t \cdot y \cdot n_1 = k \cdot y \cdot n_2$ , where  $k$  is the ratio of (average) pension to wage,  $n_1$  proportion of population of working age and  $n_2$  of retirement age, and hence  $n_1/n_2 = T_1/T_2$ . When there is a funded pension arrangement, then the requirement becomes  $y \cdot T_1 \cdot s \cdot (1+r) = p \cdot y \cdot T_2 \cdot (1+g)$ , where  $r$  and  $g$  are interest rate and growth rate over the time period  $T_1/2 + T_2/2$ . We could then argue that  $r$  and  $g$

need to rather close to one another: if the rate of return on savings is substantially above the growth rate, then each retired generation withdraw for the economy more relative to national income than that generation contributed during their working life.

### **3. Aggregate demand, aggregate supply and the sustainable growth**

In earlier papers (Fontana and Sawyer, 2012, 2013) we have maintained that three main resources are used in or up in the production process, namely physical capital, labour services and 'ecological footprint'. It follows that the interaction between aggregate demand and the growth rate of physical capital, labour services and 'ecological footprint' determines the level of output and its growth rate. Furthermore, this paper has assumed that investment is both a component of aggregate demand and the main driver of aggregate supply through changes in the capital stock. Therefore, the growth rate of physical capital is the main determinant of the level of output and its growth rate. Within this framework, there is then the question of how to reconcile the growth rate of labour services and 'ecological footprint' with the growth rate of physical capital. The relationship between growth rate of labour services and the growth of demand and output will clearly set whether unemployment is rising or falling, and the difference between them would involve continuous changes in the unemployment rate. A high rate of growth of demand and capital stock relative to the sustainable 'ecological footprint' brings ecological problems.

The linkages between output (and economic activity more generally) and ecological impacts can be variously formulated. A widely used one is the 'Kaya identity'. 'This identity decomposes the determinants of the impact  $I$  into three factors through the equation  $I=A*e*c$  where:  $A$  is the level of economic activity measured by GDP,  $e$  is the energy intensity of production (i.e. the amount of energy needed to produce one unit of GDP) measured by Primary Energy/GDP,  $mmc$  is the impact intensity of the energy used (i.e. the amount of resources used or the number of CO2 molecules emitted by a unit of consumed energy) measured by Impact/Primary Energy. (Chancel, Demailly, Waisman, and Guivarch, 2013). Our formulation (in Fontana and Sawyer, 2012, 2013) has been to link the 'ecological footprint' to the level of output (current and cumulative) and the growth of that footprint then to level and growth of output. Then, an upper limit on the sustainable 'ecological footprint' leads to an upper limit on the growth rate (which indeed may

be negative, i.e. de-growth). In a demand-led world (which is that of a PPK analysis), there have to be mechanisms, which bring growth of demand into line with the sustainable 'ecological footprint'. In the absence of such mechanisms, output and demand will grow faster than the ecology can sustain, leading to global warming, damages to the ecosystem, which themselves will make growth more difficult.

Three growth rates of output were identified in the papers cited above. These are:

- (i) The growth of capital stock, which arises from the interactions of investment and savings. This is a demand-led growth rate (which is not unlike the 'warranted rate of growth' in the Harrod-Domar model setting). There is then a corresponding (and equal, since the capital-output ratio is treated as constant) growth of output.
- (ii) The growth of the labour resource in 'efficiency units' which would result in a growth of output consistent with a constant rate of employment. This is a supply-led growth rate based on the labour force. Since the analysis assumes a 'fixed factor proportions' production function, this means that the rate of growth of output and of the growth of the labour force in 'efficiency units' would be equal.
- (iii) A growth rate of output, which is consistent with a sustainable growth of the 'ecological footprint'. It is postulated that there is a sustainable growth rate (possibly zero or negative) of the 'ecological footprint'. This is a nature-led growth rate, which is the 'ecological footprint' constrained rate of growth of output.

There would not be any automatic market forces which would bring these three different growths of output into alignment with each other. Overuse (or underuse) of the capital stock, the labour resource in 'efficiency units', or the 'ecological footprint' will not produce an automatic, self-adjusting change in relative prices such that the overuse (or underuse) say of 'ecological footprint' will be eliminated with an increase (decrease) in the use of capital stock or the labour resource in 'efficiency units'. This means that at least in the short run it cannot be excluded that the economy will experience severe environmental problems together with rising levels of unemployment (depending on the growth rate of labour as compared with actual growth) and idle capital stock (also depending

on actual growth rate). In the long run, short of an ecological disaster, overuse of the 'ecological footprint' has to be contained, and possibly eliminated. Therefore, this paper maintains that the long-run growth rate of output is nothing but the sustainable growth rate of output, that is the lowest output growth rate arising from the use of physical capital, labour services and 'ecological footprint'.

In a PKK macroeconomic analysis, the achieved rate of growth is demand-driven. It is postulated that there are ways by which the growth of the labour force is influenced by the achieved rate of growth, for example, productivity may be encouraged, people 'pulled in' or 'pushed out' of the labour force through changes in participation patterns, migration, etc.. Nevertheless there is not complete adjustment and the unemployment rate would change over time depending on the balance between the growth of output and the growth of the labour force (in effectiveness terms). But the eventual constraint on growth of output which would be sustainable comes from the ecological footprint considerations and the effects of growth on that. Continuing growth above that sustainable rate would bring ecological consequences, climate change, effects on food supplies etc., which would feed back to reduce the possible growth of output. In effect our focus here is on mechanisms through which the demand-driven growth rate can be brought into line with the sustainable rate. One element of that is the reduction of the demand-driven growth, and notably to the driver of investment. Another element is the channelling of investment into forms of production which diminish the environmental impacts of economic activity (in a sense that reflected in the  $c$  coefficient in the Kaya identity). It is to some of those issues we now turn with a focus on the role of the financial sector in setting the investment agenda. In order to do so we have to discuss some features of the financial system which we do in the next section through adopting a circuitist perspective.

#### **4. A circuitist view of the financial system**

The circuitist approach (Graziani, 2003) to the financial system is firstly firmly based on a view of credit money and not commodity money, and where banks are the creators of credit money. Banks in that context are institutions whose liabilities are accepted as a

means of payment, and hence count as money: that is bank deposits transferable between individuals are money. Banks here may be publically or privately owned, operated for profit or be non-profit: their key attribute is the ability to create money *ex nihilo*. Central Banks would be included under this heading of banks. The circuitist approach is also based on a simple principle – that expenditure can only occur if the person seeking to undertake the expenditure is in possession of money – expenditure has to be financed. Keynes (1937b) noted the ‘finance motive’ for holding money – prior to expenditure being undertaken. It is remarkable the degree to which this rather obvious requirement is overlooked in mainstream analysis. A particular element of the circuitist approach, fitting in with endogenous money, is the links between the financing of production through loans and the creation of money. An example of a circuit is as follows. A firm is seeking to start or expand production and in order to do so it has to acquire inputs into the production process such as labour, materials. It seeks a loan (makes use of overdraft facilities) for the financing of the purchase of inputs, which thereby creates money (in the form of bank deposit). The firm spends the money which then circulates. Some is received by workers in the form of wages, and which in turn is spent etc., and some is saved.

When savings are generated, they may initially take the form of bank deposits. But the bank deposits may in turn be used to acquire other financial assets.

From the circuitist perspective, the role of the financial system should be viewed in terms of facilitating the initial finance for investment and for the final funding of investment with the allocation of the savings which have occurred to the funding of investment projects. The initial finance comes from banks in the form of loans, whereas the latter is performed more generally through the financial system including banks. The relationship between investment and savings is a causal one running from investment to savings, though there is in a sense *ex post* allocation of savings to investment projects through portfolio rearrangements.

**Figure 1 near here**



In Figure 1 a representation (for a closed economy without government for simplicity) of a circuit analysis where some features of financialisation have been introduced. A circuit opens with the provision of loans by the clearing banking system, where a bank is here to be seen as an institution some of whose liabilities are a means of payment – that is bank deposits are money. The loans can be provided to firms to finance production, whereas loans provided to households are consumer credit/debt.

The significance of this presentation of the circuitist approach and the summary in Figure 1 arises from the distinction between the *financing* of investment (and production more generally) and the *funding* (final finance) the end of accounting period equality between outgoings and incomings. The banking system with its ability to enable money to be created through loans is essential to the financing of investment: in the absence of finance, expenditure cannot take place. The other parts of the financial system are not involved in the financing of investment in this sense. The circuit represents the role of banks in the provision of initial finance, and the flows of final finance through the financial system. It also seeks to reflect some of the relationship between banks and the rest of the financial system. There are also to be added the sale and resale of existing financial assets which takes place within the financial system.

### **5. Constructing a financial system conducive with sustainability**

The centre of attention here is the requisites of a banking and financial system, which will be consistent with a sustainable environmentally friendly growth path, and one which we postulate will involve lower rates of growth and investment. This involves a banking and financial system, which is itself robust and not subject to crises that lead to recessions and unemployment. It also requires a banking and financial system which does not develop in ways which generate instabilities in other parts of the economy. The interactions of the banking and financial system with the property market are sources of asset price bubbles and subsequent bursting. The development of securitisation and derivatives based on commodities serve to generate instabilities in other parts of the economy: notably recent examples have been food and energy markets in 2007/08.<sup>14</sup>

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<sup>14</sup> On this see Verchelli (2014).

The construction of a banking and financial system in a capitalist economy, which does not involve instabilities, credit and asset price booms and busts and periodic financial crisis is difficult if not impossible. It is an inherent feature of banking and financial systems to involve such instabilities. Minsky, for example, argued that ‘the readily observed empirical aspect is that from time to time capitalist economies exhibit inflations and debt deflations which seem to have the potential to spin out of control’ (Minsky, 1994) in his introduction to a piece of the ‘financial instability hypothesis’. Minsky states (1986: p. 327) that “turbulence –especially financial instability- is normal in capitalist economy; the tranquil era between 1946 and 1966 was an anomaly”. The recent focus on the financial crises of 2007/09 and its global dimensions has tended to overlook the frequency of financial crisis.

The history of capitalist economies is littered with financial crises of which the 2007-09 financial crises were amongst the more global and extensive; but it should not be overlooked that there were other major crises (notably the East Asian 1997). Laeven and Valencia (2012) (from their Figure 4) record 346 financial crises in the period 1970 to 2011, of which 99 were banking crises, 18 sovereign debt crises and 153 currency crises, 11 banking and debt, 28 banking and currency, 29 debt and currency, and 8 combined all three elements. After a lull in the early 2000s, a total of 25 banking crises are recorded for the 2007 to 2011. Their paper also gives estimates of the large scale costs of financial crises.

The period of financial liberalisation since circa 1970 appears to have exacerbated the numbers, though, of course there are many examples of pre-1970 crisis. However, as hinted in the section above on the circuitist approach, there appear to be inherent features of the banking and financial system which tend to generate financial instability, credit booms and busts etc., and that whilst measures of regulation and structure of the financial system can be adopted which reduces those tendencies, nevertheless they remain. ‘The financial instability hypothesis is a model of a capitalist economy which does not rely upon exogenous shocks to generate business cycles of varying severity: the hypothesis contend that business cycles of history are compounded out of the

internal dynamics of capitalist economies as well as out of the system interventions and regulations designed to keep the economy operating within reasonable bounds.’ (Minsky, 1994, p. 157)

In order to think about the robust banking and financial system, it is helpful to consider what the sources of instability can be, and hence what design measures would aid the reduction of such instability.

At a general level, the requirement is for a banking and financial system which serves the rest of the economy rather than the rest of the economy serving the interests of the financial sector. Apart from the provision of a well-functioning payments technology, the key requirements which should be made for a financial system are that:

- (i) it expands in a way which is consistent with the environmentally sustainable rate of growth,
- (ii) it channels savings into the social desirable types of investment.

The first part of that includes seeking to construct a stable banking and financial system. A more significant element is that the financing of investment, initial and final in the terminology of the circuit approach, is channelled towards socially desirable and environmentally friendly investment, and not towards financial asset accumulation speculation. A similar thought applies to the second part. It also though indicates that the thrust of the operations of the banking and financial system should be on the financing and funding of real investment, and not financial investments, rather than be engaged in securitization, derivatives etc..

The relationship between the banking and financial sectors and economic growth has long been debated in terms of the positive effects of what is termed financial development and economic growth. It has generally been argued, theoretically and empirically, that there is a positive relationship between financial development and economic growth, though without agreement on the directions of causation.<sup>15</sup> Financial development has been viewed in terms of the size and structure of the financial sector: the size has meant bank deposits to GDP and the ratio of stock market capitalisation to GDP, and structure has referred to the relative roles

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<sup>15</sup> For recent view of this literature and elaboration of points made in this paragraph see Sawyer (2014a).

of the banking system and the stock market (the contrast being drawn between bank-based and market-based financial systems)<sup>16</sup>. Although the term financial development is used in this literature, it may be a case of the size of the financial sector which is being measured in the empirical work in this literature. The financial sector on those measures and more generally has grown substantially in the past few decades in the era of financialisation.<sup>17</sup> Whilst this growth has involved some rise in measures of size such as that of the stock market, it has also involved growth of derivatives and securitization and trading in those derivatives, and in the scale of financial institutions through expansion of their assets and liabilities, developments which have fed into increased instability of the financial system. Causal observation suggests that in industrialised economies the growth of the financial sector has outpaced the growth of the real economy, and the increased scale of the financial sector has not been associated with faster economic growth. More formally, in some recent papers the positive relationship between financial development and economic development has been found wanting. For example, 'Up to a point, banks and markets both foster economic growth. Beyond that limit, expanded bank lending or market-based financing no longer adds to real growth' (Gambacorta, Yang, Tsatsaronis, 2014, p.21).<sup>18</sup> Others, e.g. Epstein and Crotty (2013), have argued that the financial sector has become too large; and that the ways in which the financial sector has expanded in recent times (through securitisation for example) have aided instability and have engaged in activities which will resource-using do not contribute to the financing and funding of investment.<sup>19</sup> One may be tempted to argue that further growth of the banking and financial sector should be encouraged in order to reduce investment and the growth of the real economy! But we resist that temptation by recognizing that not only could the resources deployed in the banking and financial sector be put to socially

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<sup>16</sup> For critique of the bank-based/market-based typology see Sawyer (2014b).

<sup>17</sup> The FESSUD Studies in Financial Systems (available at [fessud.eu](http://fessud.eu)) provide detailed information on the scale of financialisation for a range of 15 countries.

<sup>18</sup> For some further discussion on this point see Sawyer (2014a)

<sup>19</sup> See Sawyer (2012) for further discussion on this point.

beneficial use, it is also necessary to ensure that the growth which does occur is not environmentally damaging and is ecologically sustainable.

In the context of slower growth, it may well be the case that potential savings are significantly in excess of potential investment requirements.<sup>20</sup> Indeed as indicated above there is likely to be a need for a budget deficit to in effect absorb the excess of potential savings over investment which enables the potential savings to be realised. Thus the major requirement is not likely to be the stimulation in any sense of savings or investment expenditure in total, but rather to ensure that investment is environmentally friendly and is not promoting economic activities which are, for example, carbon-intensive.

In light of the financial crisis, its long-lasting impacts on economic prosperity and employment and the costs of that crisis (in terms of 'bail-outs' and of lost output), there has been much discussion of reforms of the financial system and its regulation. Although there has not, in general, been much discussion of the links between sustainable environmental growth and reforms of the financial sector, those discussions can be drawn on here. The purposes of such reforms of the banking and financial system would be to construct a system less prone to instability and crisis. If reforms were carried through, and their purposes achieved, that would be over-all beneficial for economic performance. But how to ensure that beneficial economic performance takes the form of sustainable growth (and also we would argue full employment).

Here we argue for a range of changes in the banking and financial sector which would aid reducing financial instability and contributing towards the channelling investment into environmental friendly activities.

The key role of the financial sector is viewed here in terms of the relationship between savings and investment and, more specifically, to ensure that the socially desirable investments are undertaken.

Credit rationing is a pervasive feature of the behaviour of banks and other financial institutions in the sense that banks have to assess the risks of non-payment and default of loans, and the interest rate charged and the other conditions of any loan will reflect

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<sup>20</sup> The stress should be on *potential* savings as savings can only be realised if there is prior investment, government net spending and net exports.

that risk assessment. There will be credit rationing in the sense that potential borrowers are not able to borrow all they wish at the loan rate, and indeed the loan rate charged by banks increases with the scale of borrowing as the perception of default increases. The credit allocation processes depend on risk assessments which in an uncertain world can only be perceptions of frequency of default etc., rather than based on well-established probability distributions. There have been many large literatures on how banks and other financial institutions approach lending to different social, ethnic groups and gender, and in effect discriminate against some and practice financial exclusion. The structure of the financial system and the legal framework must be such as to ensure that credit rationing practices do not operate against 'green investment', and more generally environmentally friendly investment.

There are many activities undertaken by the financial sector which do not bear directly on the functions of financing and funding of investment expenditures. The trading of existing financial assets, the growth of 'fictitious capital', and the rise of assets and liabilities (relative to GDP) contribute little to that key role. A particular recent example has been the development of high frequency trading (HFT), which relies on computer algorithms in the context of trading strategies carried out by computers to move in and out of positions in seconds or fractions of a second. High frequency trading exacerbates the issues raised by Keynes in the 1930s, when he wrote that '[S]peculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done. ... The introduction of a substantial government transfer tax on all transactions might prove the most serviceable reform available, with a view to mitigating the predominance of speculation over enterprise in the United States' (Keynes, 1936, pp. 159-160). The casino analogy should also be viewed in terms of who profits from HFT – in the case of the casino we know it is the 'bank': for HFT those operating the system appear to find it highly profitable, but at whose expense? In the present context, the development of derivatives, securitisation and high frequency trading raises two issues. The first relate to the resources devoted to such trading, and whether that is a useful use of resources, whether that be the highly educated people deployed in such activities or the development of high speed communications to facilitate such trading. The second is a long

standing concern over the volatility of prices in financial markets, and whether volatility of prices is exacerbated by the frequency of trading. These concerns had been expressed particularly with regard to foreign exchange markets (influencing Tobin, 1978 to propose a tax on foreign exchange transactions which became much associated with his name) and to stock markets (for example, Baker, Pollin and Schaberg, 2003). However, the development of financial assets which are based on commodities, whether food, minerals and oil, have raised similar questions with regard to the effects which trading in such assets have on prices and their volatility.

The essential rationale for a financial transactions tax remains and is indeed re-inforced by financialisation, by which we mean the growth of the financial sector in its economic activities, power and influence, and the specific direction which financialisation has taken in the past three decades with the growth of securitisation and derivatives. The advocacy of a financial transactions tax is not to preclude other taxes on the financial sector such as financial activity taxes. The advantages of a financial transaction tax would not only dampen down the resources deployed in the buying and selling of existing financial assets which are of little social benefit, but also serve as a source of tax revenues which can be deployed for the funding of public green investment, for example.

## **6. Structure of the banking sector**

The structure of the banking sector can be viewed in terms of what would be conducive for financial stability, and indeed much of the discussion on the structure and regulation of the banking sector has focused on that issue. The focus here is somewhat different directly on the structure of the banking system which would aid industrial policy and strategy, though financial stability would generally aid the passage to sustainable growth.

One element of a change in the structure of the banking sector is the idea of the separation of 'narrow banking' from 'casino banking'; less pejoratively expressed as separation between commercial banks and investment banking/securities trading. Such a separation was embodied in the American Glass–Steagall Act, the final repeal of which in the 1999 Gramm–Leach–Bliley Act has been attributed a role in the generation of the financial crisis of 2007/09. The response of the UK Independent Banking Commission (2011) was 'ring fencing' – that is while a financial institution could engage in both commercial banking and investment banking

there would be internal separation between the activities, with the intention of ‘insulating UK retail banking from external shocks and of diminishing problems (including for resolvability) of financial interconnectedness’. They proposed that a ‘wide range of services should not be permitted in the ring-fence’. The ‘activities [which] should not be carried on inside the ring-fence: services to non-EEA customers, services (other than payments services) resulting in exposure to financial customers, ‘trading book’ activities, services relating to secondary markets activity (including the purchases of loans or securities), and derivatives trading (except as necessary for the retail bank prudently to manage its own risk).’ (Executive summary Independent Banking Commission, 2011, p.11). The essential arguments for ‘ring fencing’ relate to the stability of the financial system. The concern here is somewhat different, namely for the focus of the financial sector on the savings—investment linkages and not on trading in existing assets.

The proposals here would run along three lines.

The first comes from banks concentrating on ‘channelling savings to productive investment’, to which we would add the role of the initial provisions of loans for investment. The other side of that is the discouragement of dealings in derivatives and other financial assets. This can come from the ‘legally enforceable separation between retail and speculative banking. This would help to contain the toxic effects of future crises. However, merely separating the banking arms is not enough because speculators would continue to be funded by monies from savers, pension funds and insurance companies to finance their gambling habits’ (Sikka, 2014, pp.21-2). Policies such as this are generally proposed with regard to lessening financial fragility and proneness to credit bubbles. From the perspective here they are viewed in terms of the linkages between savings and investment.

The second is diversity of the banking system. Although building societies were technically not banks for many years, and their key function was the provision of housing funding and a vehicle for household savings, they were mutual organisations providing specialised services. The German banking system stands in some contrast to the UK system with a range of different ownership forms (private, public and mutual) and the local and regional focus of much of the banking system with *landersbanken*, savings and



co-operative banks.<sup>21</sup> Without eulogising the German system it does seem to have been rather more adept at funding small and medium sized enterprises and less prone to financial instability.

“All of this suggests that government can and should play a central role in structuring the financial system to achieve sustainable long-term economic growth. And in contrast to the current system, which centralizes power in mega-firms and directs capital in just a handful of channels, an ideal system would be more decentralized and create more diverse channels for capital investment” (Block, 2014, p. 12).

The third is to reduce the degree of concentration in the banking sector, some of which could be achieved through more diverse organisations, and the application of competition policy more stringently to the financial sector. The reduction of concentration could go alongside a more regionally based banking system. But this raises the losses of economies of scale. Davies, Richardson, Katinaite and Manning (2010) conclude that ‘the majority of academic studies, on the other hand, do not find positive evidence for economies of scale and scope beyond a relatively small size’ and that ‘the bulk of the empirical literature to date has failed to identify material economies of scale in commercial banking beyond a relatively modest size.’ (Davies, Richardson, Katinaite, Manning, 2010, p.325). Davies and Tracey (2014, pp.243-4) argue that after allowance for the costs of ‘too big to fail’ syndrome, they ‘no longer find evidence of scale economies’ for a sample of large banks.

An important difference between the allocation of funds through banks and through financial markets is that it is less difficult to inject requirements on the ways in which decisions are made in banks as compared with financial markets<sup>22</sup>. Indeed we would see a significant reason for putting more weight on banks than on financial markets arises from that very point<sup>23</sup>. An important element of the financing and funding of a sustainable growth strategy is to seek to ensure that funds flow in the direction which is compatible

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<sup>21</sup> See Detzer, Dodig, Evans, Hein, and Herr (2013) for detailed survey of the German financial system.

<sup>22</sup> The general idea has been stimulated by Pollin (1995).

<sup>23</sup> For critical assessment of the role of stock markets see the work of Ajit Singh, e.g. Singh (2009)

with that strategy. This can involve some degree of guided lending for banks – that is requirements that a specified proportion of their lending are to those sectors identified for development and growth. In the current circumstances, we would advocate that the key focus here should be on green and environmentally friendly investment. This could draw on the US experience of the Community Reinvestment Act (CRA), introduced in 1977 and revised in 1995, whereby banks and other financial institutions are legally required to direct a portion of funds to lending to the local community. ‘The Community Reinvestment Act is intended to encourage depository institutions to help meet the credit needs of the communities in which they operate, including low- and moderate-income neighbourhoods, consistent with safe and sound operations. The CRA requires that each depository institution’s record in helping meet the credit needs of its entire community be evaluated by the appropriate Federal financial supervisory agency periodically. Members of the public may submit comments on a bank’s performance. Comments will be taken into consideration during the next CRA examination. A bank’s CRA performance record is taken into account in considering an institution’s application for deposit facilities’ ([http://www.federalreserve.gov/communitydev/cra\\_about.htm](http://www.federalreserve.gov/communitydev/cra_about.htm); accessed March 2014).

This should not be taken to underestimate the practical difficulties involved here, of which the most obvious one would be the specification of the forms of investment which would qualify and which would not. It is though possible to point to banks and many organisations which adopt ethical and environmental factors into their decisions on lending and financial investments. An ethical bank such as Triodos ([triodos.co.uk](http://triodos.co.uk)), financial institutions seeking Sharia compliant investments etc. have to draw up codes of conduct for their investment behaviour. The ‘guided investment’ approach would be along similar lines, though recognising that mistakes will be made, and the monitoring of such an approach should not be understated.

The underlying philosophy is that banks are making credit allocation decisions all the time, and the decisions which come out are not necessarily socially desirable. The purpose here would be to seek to ensure that sufficient credit is channelled in the directions consistent with the overall sustainable strategy.

A further arm in policies designed to strengthen a sustainable strategy which has to be put on the table is the establishment of a State sponsored development bank along the lines of the European Investment Bank to generate funds in the financial markets for onward lending to environmentally sustainable projects: the UK Green Investment Bank would be one example of this.

Insofar as a State sponsored development bank was drawing on government funds (as the Green Investment Bank does) it would run into the objection that it adds to budget deficit and to the public debt. Our response to that would be that borrowing for investment also adds to the assets of the public sector (whether through infrastructure investment or through onward lending to the private sector), and that the concern should be that the funds are well used, adding to the desired direction of investment, and aiding the achievement of full employment. There is no 'tipping point' for the national debt to GDP ratio which threatens growth<sup>24</sup>.

But also note that as with the European Investment Bank any lending by governments can be leveraged through direct borrowing by the development bank, and that such borrowing (as is the case with the European Investment Bank) does not appear on the balance sheets of any national or EU organisation.

## **7. Concluding remarks**

An ecologically sustainable growth path for the economy will likely entail a lower rate of growth of (modified) GDP and lower investment requirements. This is not to say that at the present time there is not a need for the re-building of productive capacity and a shift towards greener and more environmentally friendly investment. But in the longer term the implications of lower investment have to be examined. From a simple macroeconomics perspective, lower investment (relative to GDP potential) will involve lower rates of capacity utilisation and unemployment, unless there is compensating changes to the budget deficit. Employment is regarded as a human right, and we would place high levels of employment (paid and unpaid) as a key target of macroeconomic policy. The reduction of inequality (of income, wealth and economic well-being) would be added to that agenda, in

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<sup>24</sup> See Harndon, Ash and Pollin (2014) for critical assessment of work, which purported to show that there was a 'tipping point'. Arestis and Sawyer (2014) provide an extensive discussion of the points mentioned in the text.

its own right, but also as a means of aiding the reduction of unemployment, aiding economic and social well-being without faster growth. Securing high rates of employment would likely require a significant budget deficit. It would also be noted that in our analysis a budget deficit would help to maintain profits, and to enable savings to be realised.

The focus in the first part of this paper has been on the demand-side with the post-Keynesian-cum-Kaleckian view that the level of economic activity is demand-driven in the short-run and in the long-run. But of course the growth path which would be demand-driven could well be environmentally unsustainable. Policies on the demand side which are a combination of restraining the overall rate of investment and re-structuring investment in a much 'greener' direction are required.

A circuitist framework of the banking and financial system has been presented. This framework highlights the role of banks in the provision of loans to finance investment (and production more generally) and the role of the financial system in the funding links between savings and investment. It led us to argue that the banking and financial system should focus on those roles. The approach which we have adopted with regard to the financing and funding of investment involves the idea that potential savings are more than sufficient for a level of investment which is compatible with environmental sustainability. Some ways in which the financial system could be restructured to better serve the economy, society and more significantly here sustainability.

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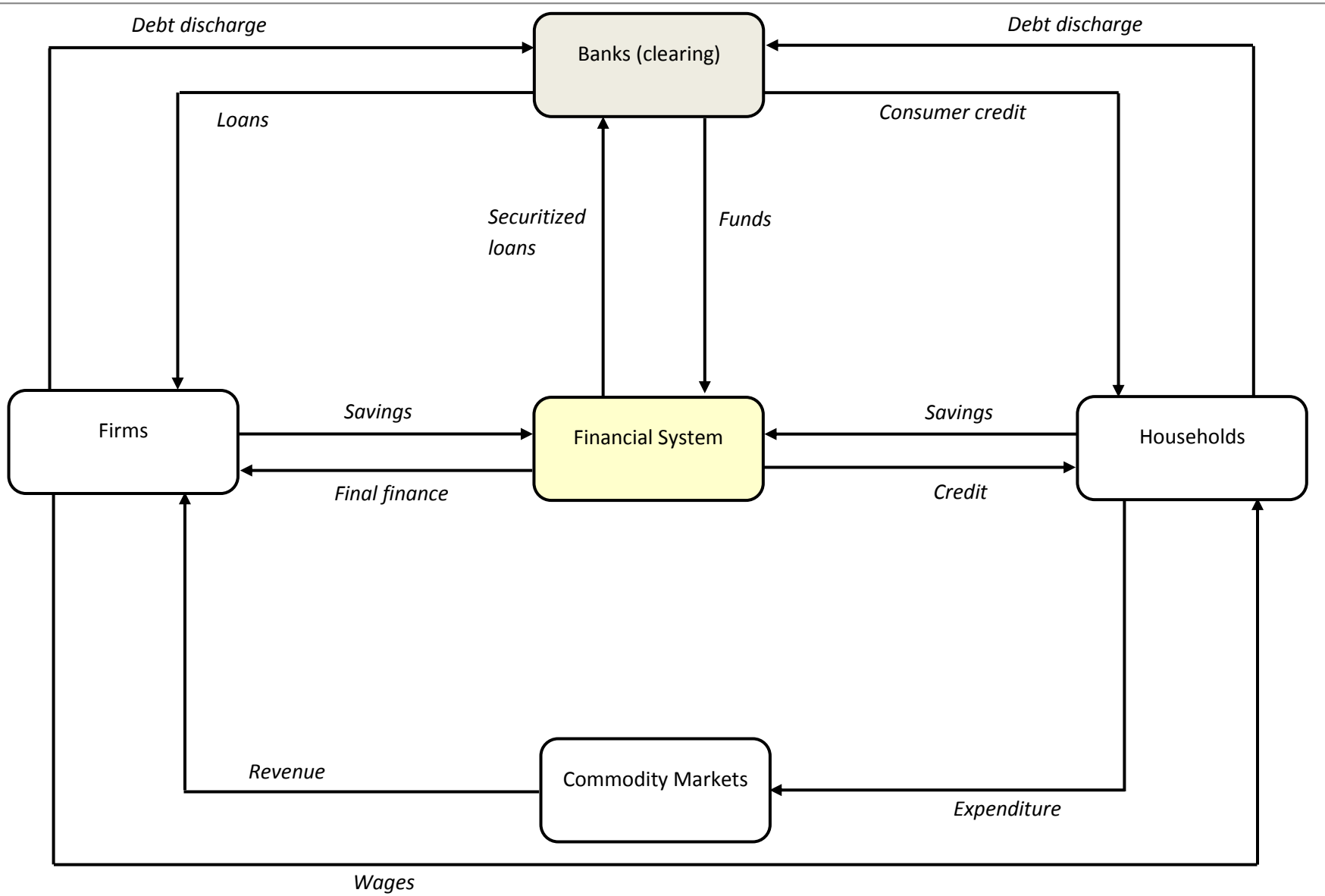
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Figure 1. Financialisation in the monetary circuit scheme.



Source: Passarella Veronese and Sawyer (2014).