

Saving and Investment in US Economic Growth

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Abstract

Key economic concepts of saving and investment are defined and discussed in this paper. It is shown that the equation “saving=investment” is a fundamental fallacy of macroeconomics due to a confusion between real and financial variables, and also between stock and flow variables. Economic growth is shown to be driven by investment, not by consumption as Keynes would have it or by saving as Hayek would have it. The Keynesian fallacy of “saving=investment” in the national account has masked four decades of “borrowing and spending” in the US, leading to negative saving rates, accumulation of enormous debt, negative productivity and a stagnating economy.

Key words: saving, investment, growth, scientific, macroeconomics

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1. Introduction

In a scientific refutation of Keynesian economics, it was shown in a previous paper (Sy, 2014) through a theoretical and empirical analysis of the US evidence that a high level of consumption does not lead to high economic growth – indeed, just the opposite, a potential for economic collapse. In this paper, saving and investment are analysed more closely for their impact on US economic growth.

The need for a review of basic economic concepts such as saving and investment is evident from the fact that economists do not generally agree even about the current state of the economy, whether it is good or bad, improving or deteriorating, let alone agreeing on the causes of the current crisis. Without a consensus view about the reality, how could there be any justification for directing the economy to a better state? Policy makers use economic propositions to justify their actions, but have admitted (White, 2014) that economics, monetary policy and central banking are not a science.

Modern mainstream economics has replaced some philosophical arguments with mathematical or statistical arguments, but has confused mathematics with science (Hayek, 1974). Fundamental economic propositions, whether mathematical or not, have rarely been tested and validated against economic evidence, as required by science. Unlike physics, economics has few universally valid propositions. The result is endless debate about fundamental economic propositions over many decades, without definitive resolution.

One such important debate is about the impact of saving and investment on economic growth. In a departure from old ways with new thinking, this paper is written completely differently to the standard procedure of citing extensive references upfront, because we are starting afresh, abandoning conventional premises of most published papers. As Keynes (1936, xxi) observed:

For if orthodox economics is at fault, the error is to be found not in superstructure, which has been erected with great care for logical consistency, but in a lack of clearness and of generality in the premises.

Conventional premises of saving and investment are considered, in this paper, to be based on unclear and inconsistent notions. Readers need to abandon their preconceptions. Basic concepts of saving and investment are clarified in this paper by defining them afresh for the modern economy in order to tally with empirical data, to explain economic propositions, to challenge false ones and resolve perennial paradoxes.

Saving and investment are defined and discussed in sections 2 and 3. A classical economy is discussed in section 4 in order to distinguish it from a modern economy in section 5. In section 6, the “saving=investment” fallacy, which is a fundamental assumption of macroeconomics, is explained. In section 7, national account data are used to validate empirically the new definitions of saving and investment. From new clarification of saving and investment, the relationship between saving stock and credit is discussed in section 8. The impact of saving and investment on economic growth is discussed in section 9. Fallacies about saving are discussed in section 10. The consequences of Keynesian fallacies on the US economy are summarised in section 11. The conclusion in section 12 reviews what has been done and summarizes the key findings.

2. Saving

Saving in the modern economy is defined in this paper as the accumulation of either real or financial assets. Real saving in real assets includes, in the private sector, land, residential or commercial

property, commodities, machinery and other real capital. In the public sector, real assets include public buildings, infrastructure of utilities, transport, health, education and other government enterprises. Real wealth is total real saving accumulated over time.

Financial saving in financial assets consists of financial claims which include bank deposits, government or corporate bonds, company shares, derivatives, units of investment funds and pension funds, etc. Financial assets are simultaneously the financial liabilities of someone else. In an economy without an external sector (closed) the financial saving of a nation nets out to zero.

Real assets are “hard” or tangible assets which have intrinsic economic value in the sense that they can be used immediately for real economic production. Financial assets have to be converted to real assets before they can be used for real economic production. Financial assets can fluctuate in value independently of economic production. In particular, financial assets may vanish or become valueless due to revaluation of prospects or due to promises not met, whereas real assets always have some intrinsic economic value because they are not the liabilities of other people.

Saving is a stock or amount of assets and it is not a flow variable in economic terms. Saving is an asset item on the balance sheet statement, and it is not an item on the income or “profit and loss” statement which, however, may account for *changes* in saving. Obviously, the two types of accounting statements interact dynamically over each accounting period, because saving in financial assets can produce income, and earning income may require withdrawal of saving or result in accumulation of saving. It is only the flow of saving which affects the economy in any period, because saving as a stock has generally no direct or immediate impact on economic activity.

In macroeconomics, the use of the term “saving” in the national accounts is therefore inappropriate and confusing. It has led to serious conceptual errors in Keynesian economics, as will be shown in this paper. Because the national accounts are essentially a periodic analysis of economic production, they are statements of the flow of economic activity. Saving being a stock variable has no place in the flow equation of economic variables. The best that one could do to salvage a situation of vague language is to interpret tacitly “saving” as “rate of saving” for clarification. Even so, the adverse consequences for macroeconomic theory do not end here, as they still lead to fundamental fallacies.

3. Investment

Just as there are two types of assets in saving, there are two types of economic activity for investment: real investment and financial investment. Real investment is defined as the allocation and use of capital for economic production: manufacturing goods and providing services. Aggregate economic production of a nation is measured commonly by the gross domestic product (GDP). Financial investment is defined as the purchase and holding of financial assets which are claims on future income of other economic agents. Financial assets are traded in financial markets.

Financial investment may not lead to economic production and certainly may not result directly in economic production. For example, investing in a government bond provides a stream of interest income which comes from future taxation which is not directly related to economic production. Financial investment can appear to grow from valuation changes without any impact on real investment or production. The key distinction between the two types of investments is that only real investment leads directly to economic production and hence to economic growth. Financial investment is synonymous with financial saving.

Real investments depreciate in the course of economic production, as land degrades in agriculture or as machines wear out in manufacturing. The rate of depreciation is often referred to as the rate of consumption of fixed capital. New gross investment is needed to compensate for depreciation just to maintain the same level of real investment to produce the same level of economic output. Additional output measured as economic growth requires a net increase in real investment.

The return on real investment comes from the profit obtained from the sale revenue of production outputs minus the cost of inputs. Since profit depends on many economic variables which are uncertain, the return on real investment is uncertain and therefore “risky”. It is this unmeasurable uncertainty which true entrepreneurs have to deal with and which lies at the heart of capitalism (Knight, 1921).

The return on financial investment depends ultimately on the return on real investments. But the return on financial investment depends also on the evaluation of future prospects, based on the interest rates discounting of uncertain future profits. If financial investments get much higher risk-adjusted returns than real investments, there is little incentive for real investments. Recent monetary policy increased substantially risk-adjusted returns of financial investments relative to real investments, resulting in relatively more financial investment and less real investments. Less real investment may explain slower economic growth.

4. Classical Economy

By not clearly defining the distinction between real and financial in saving and investment – as one tends to do in philosophy rather than science – economists have created many paradoxes and contradictions. There are few paradoxes more basic to economics than those relating to saving and investment, which are already important concepts in classical economics.

In classical and neoclassical economics, the financial sector is absent, so that the notions of saving and investment can only be real. To illustrate the concepts of saving and investment in classical economics, consider a corn economy where only corn is produced, consumed, saved or invested. Suppose the corn economy grew and harvested 100 tons of corn in the previous season. There are only three things the economy can do with the harvest. Some of the corn can be consumed as nourishment (say 85 tons). Some can be invested for producing next season’s harvest, by planting the corn as seeds (say 10 tons). The rest (5 tons) can be saved for future consumption or investment by storing in corn silos.

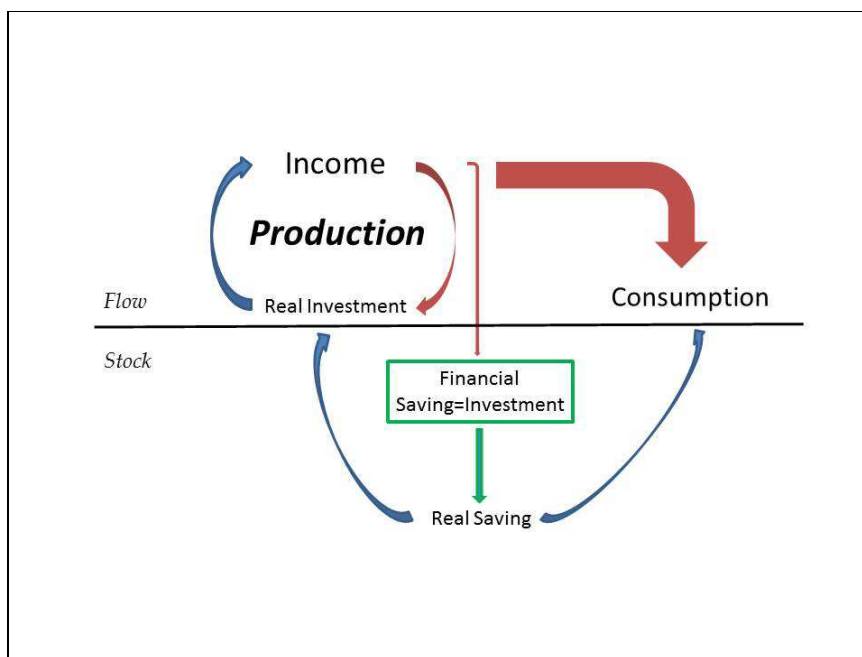
The important point for this simple classical economy is that there are no *a priori* relationships between the three different uses of income, as the proportions of consumption, investment and saving are, at least in principle, arbitrary, distinct and not directly related to one another. Most importantly, saving and investment are autonomous and generally not equal in any period. In fact, in any period, it is sensible to discuss consumption, investment and saving only in terms of their corresponding rates. In most other contexts of common usage, saving is a stock variable, not a flow variable. Furthermore, the stock of saving is exactly equal to the sum of past periodic savings.

In a simple classical economy, the stock of saving can be used in future for consumption or investment. Saving is a store or an inventory of wealth. Saving does not necessarily lead to investment; it may lead to consumption. In the flow of income statement, the values of saving and investment are generally not equal. This simple analysis contradicts one of the most fundamental assumptions in modern macroeconomics: that saving equals investment in a closed economy (without an external sector).

5. Modern Economy

Clearly the financial sector has a strong impact on the modern economy. In fact, as discussed below, the financial sector, for Keynes (1936), is the crux of saving and investment. Before commenting on Keynes, our view of the modern economy is summarised schematically in Figure 1.

Figure 1: Schematics of a Modern Economy



Income generation comes from production, which requires real investment and the use of real capital. The “engine room” of the economy accommodates investment and production and is shown in the top left-hand corner of Figure 1. The purpose of production is eventually consumption, which stimulates investment and production, but consumption is not the sole cause of investment. Typically more than 50 percent of production goes to consumption, represented by the thick red arrow in Figure 1.

What is left over from production after consumption, we call the surplus to consumption, or unconsumed surplus, or simply surplus, which is defined by the accounting tautology:

$$Income = Consumption + Surplus \quad (1)$$

It should be clearly remembered that this is a *flow* statement, an accounting identity for one period of Income analysis. A complementary *flow* statement for Expenditure is given by

$$Expenditure = Consumption + Investment \quad (2)$$

These accounting flows of the *Income Statement* are all represented by arrows above the horizontal line in Figure 1. Below the horizontal line, there are stock items of the *Balance Sheet Statement* of which saving is the key item of interest here.

Saving is generated when Income exceeds Expenditure:

$$Saving = Income - Expenditure \quad (3)$$

In a closed economy with equilibrium flow, where equilibrium is defined by income equalling expenditure, there is no net withdrawal or injection from the stock of saving on the balance sheet. In reality such equilibrium flows rarely exist – there is usually a flow to and from the balance sheet, leading to a non-zero transfer of saving. Combining the above three equations, we have another accounting identity:

$$\text{Surplus} = \text{Saving} + \text{Investment} \quad (4)$$

These simple equations show that income leads to consumption, saving and investment, which are all distinct flow quantities. It is important to emphasize that saving is not an item of expenditure – rather, saving represents a postponement of expenditure. Saving is a withdrawal from economic flow and subtracts from economic activity, as represented by the vertical downward arrow in Figure 1. For the rest of this paper it is important to distinguish precisely between our definition of saving and that of standard Keynesian economics, which we call the “surplus”. Essentially, the unconsumed surplus is the Keynesian definition of saving, but not our distinct definition of saving.

But past saving may be injected back to economic flow, either as consumption or investment, and adds to economic activity, as represented by the bottom two blue arrows in Figure 1. Future saving in the form of borrowing may also be injected into the economy. Saving of the past or future may appear at the present as either consumption or investment. For example, past savings of pension funds may lead to current consumption, whereas past savings (retained profits) of corporations may lead to current real investment.

In the modern economy, much of the saving is in the form of financial saving - or more commonly known as financial investment - which consists of financial claims. Since the financial asset of one person is simultaneously the financial liability of another, the net financial saving for the nation as a whole is practically zero. The financial sector essentially transfers current saving of one person into current expenditure of another person by creating financial asset for one and simultaneously financial liability for another.

The activities of the financial sector, which is represented by the green rectangle in Figure 1, consist mostly of the creation and the trading of financial claims. Such activities have no immediate impact on the real economy. Financial assets have to be liquidated and converted to real assets which are then used in consumption or investment to affect the real economy. For example, retirees who spend their financial assets in everyday living expenses would contribute to consumption of the national income and expenditure.

6. Saving=Investment Fallacy

From the above definitions and discussion on saving and investment, it should be obvious that saving cannot be generally equal to investment. Yet “saving=investment”, as a fundamental assertion or assumption, can be found nearly everywhere, in textbooks (e.g. Mankiw, 2009, p. 582; Blanchard and Sheen, 2009, p.63; Bernanke et al, 2009, p.403) and in research papers (e.g. Kalecki, 1949-1950; Leijonhufvud, 1979).

The fact that “saving=investment” is in introductory textbooks and is the belief of policy makers, government bureaucrats and central bankers, warrants the falsehood being called a fundamental fallacy of macroeconomics.

The “saving=investment” fallacy originated in Keynes (1936, p. 63) where he stated:

Provided it is agreed that income is equal to the value of current output, that current investment is equal to the value of that part of current output which is not consumed, and that saving is equal to the excess of income over consumption – all of which is conformable both to common sense and to the traditional usage of the great majority of economists – the equality of saving and investment necessarily follows.

Keynes called saving “*the excess of income over consumption*”, whereas we call this surplus (left over after consumption) in equation (1). The reason he gave for his appellation is “*common sense*” or “*traditional usage*”, which is considered inadequate justification in this paper (see below) because his nomenclature leads to conceptual confusion for interpreting economic data.

In our terminology, Keynes would have asserted that “surplus=investment”. From equations (1)-(4), Keynes’ assumption would be equivalent to “income=expenditure” and “saving=0” (in our terminology), implying that the income flow of the economy is always in equilibrium. If that is the case, then there can be no accumulation of saving because income always equals expenditure. In our terminology, Keynesian economics cannot have saving, as everything produced is consumed or invested in each period. As the empirical evidence shows in the next section, as it happens in reality, income never equals expenditure, even though in theory equality is possible.

For Keynesians, saving (actually surplus) is bad because it is assumed (Keynes, 1936) that it subtracts from consumption, which should be as high as possible to stimulate economic growth through the Keynesian multiplier (Sy, 2014). For Austrians, saving is good because it is assumed (Mises, 1949, p. 490-493) that it adds to investment of capital goods, which should increase labour productivity and economic growth. These restrictive views are consequences of “surplus=investment” or the “saving=investment” fallacy.

Saving as a store of wealth is neither always good nor bad for economic growth, because it merely represents a postponement of expenditure and depends on specific circumstances. If saving is a postponement of consumption, then what it subtracts from consumption demand in one period is added back in a later period – its impact on economic flow is neutral over time. The same argument applies to saving as a postponement of investment which merely represents a temporal transfer of current growth to future growth. Obviously, in the midst of a Great Depression, postponement of consumption or investment is unwise. At other times, waiting for better opportunities or circumstances in the future may be rational to provide a better overall economic outcome over a longer period of time. Also, with saving, it is possible for savers to have the leisure to create, discover and invent all that is productive, good and great in human civilization.

A reason why saving, seen as an idle resource, is deprecated by economists, lies in the assumption of most economic theories that the economy is fully predictable or manipulable like a machine. This assumption precludes the idea that economic strength and resilience to shocks are largely dependent on the stock of savings. Disasters - whether man-made (market crashes, financial crisis, wars, etc.) or natural (earthquakes, tsunamis, floods, epidemics, etc.) - lead to disruptions in economic production causing economic depression, famine, death and the destruction of capital or physical assets. The stock of savings can be drawn upon to invest, rebuild and resuscitate a moribund economy. Hence savings represent not only planned postponement to future expenditure, but also an insurance policy against unforeseeable future disasters.

A possible conjectural reason for why Keynes asserted “saving=investment” is that he placed, understandably, a strong emphasis on the financial sector, since most people’s saving goes in the first instance to financial saving, as represented by the green rectangle in Figure 1. In the financial sector, saving or investment is synonymous with the holding of financial claims which are financial

assets of saving. Keynes implicitly assumed that financial saving leads directly to real investment, as he blamed “irrational” investors in the financial markets for real economic outcomes.

In his famous Chapter 12 on “The State of Long-Term Expectation”, when Keynes discussed the “animal spirit” or fickleness of investors, he clearly identified financial investment with investment for production. Keynes (1936, p.159) warned: “*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*”. That is, in his view, surplus equals investment which is the financial saving or financial investment, determining the capital allocation of the economy. Thus, Keynesian economics does not distinguish between real and financial, in saving and investment. This view may now be commonly accepted, but it is a fallacy, as we will demonstrate in this paper.

Other economists such as Wicksell (Leijonhufvud, 1979) contradict the Keynesian assumption that “saving=investment” based on their understanding of the financial sector, including the banking system, household saving, interest rate, etc. However, “saving” for these economists is still taken to be the “surplus” for us - e.g. as Leijonhufvud (1979) stated:

Third, we define “saving” as the household sector’s “desired non-consumption” of current output, and “investment” as the business sector’s desired capital accumulation out of current output. Saving and investment, thus defined, have to be equal at full employment output for the system to be in intertemporal equilibrium.

Further, in this definition, the division of household to save only and business to invest only is unwarranted. There is no reason why household and business cannot both save and invest, even though there may be different propensities to save and invest for those sectors. For example, a household can purchase a residential property to earn rental income, which would then constitute an investment by any reasonable definition of investment.

In summary, for other economists, the denial of “saving=investment” is based on arguments from economic theories (e.g. including full employment), which are usually unproven, whereas for us, the denial of “saving=investment” is based on the conceptual distinction between surplus and saving. As will be shown below, the conceptual distinction between surplus and saving is important for understanding the true meaning of saving. In any case, saving is a *stock* item, a store of wealth, whereas real investment is a *flow* item in the national account; therefore saving should not occur in the *flow* statement of the national account.

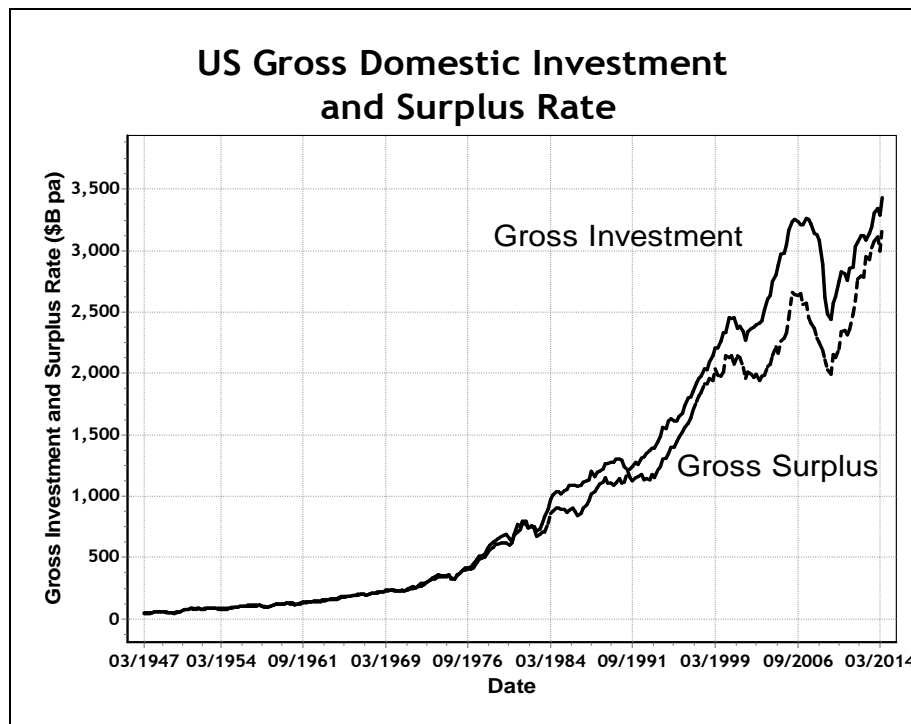
7. National Account

In a scientific approach we cannot have new concepts of saving and investment based solely on theoretical arguments without examining the empirical ramifications. The empirical evidence comes from data on national accounts, of which the US national account has the most extensive data, covering consistently the US economy since the Second World War.

When Simon Kuznets took charge at the National Bureau of Economic Research and published the first official estimate of the US national income in 1937, he was evidently influenced by Keynes (1936) and his macroeconomic theory. As a result, saving in the US national account is what we call surplus in this paper, and “net lending or net borrowing” is what we call saving (or more accurately the saving rate) which is defined as surplus minus investment from equation (4). In other words, we reject the equilibrium assumption underlying the interpretation of the national accounts, by re-interpreting certain “statistical discrepancies” as measures of the extent of disequilibrium.

The historical saving and investment data (since 1947) used in this paper come from Section 5 of the National Income and Product Accounts (NIPA) Tables published quarterly by the Bureau of Economic Analysis (BEA, 2014) for the US economy. Table 5.1 of NIPA provides the data for saving and investment by sector, seasonally adjusted at annual rates. It can be seen from Figure 2 that US gross investment consistently exceeded gross surplus rate since the 1970s. The excess is particularly large since the new millennium, which is often mistakenly considered a “statistical discrepancy”.

Figure 2: US Gross Investment and Surplus



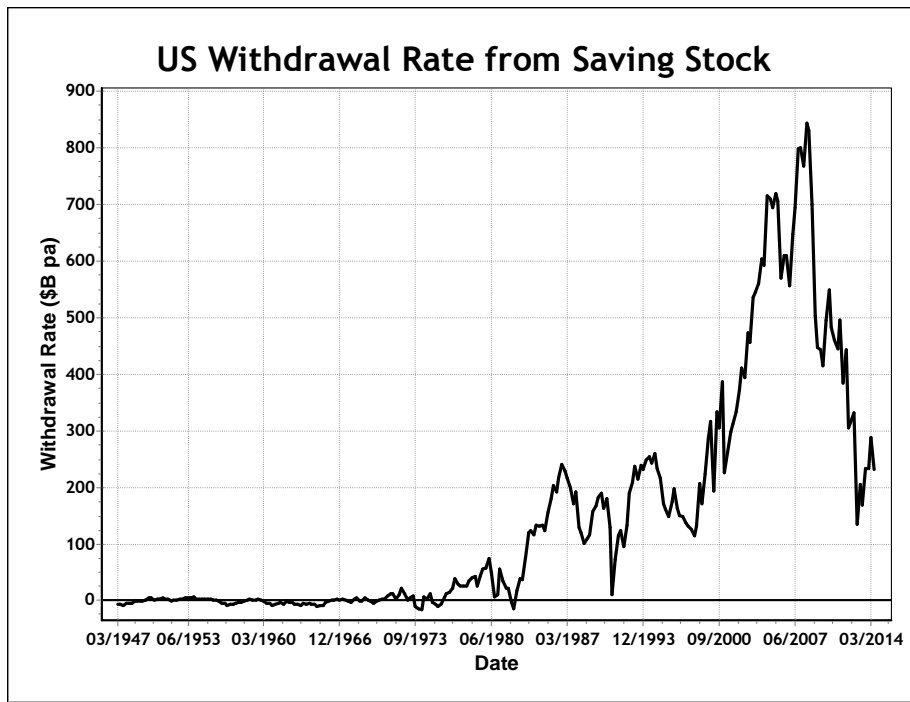
Gross surplus (called gross saving by BEA) minus gross investment in Table 5.1 of NIPA is item 35 labelled “Net lending or net borrowing (-), NIPAs” - which is significantly, what we call the national saving rate. Since gross investment is greater than gross surplus, the US saving rate (in aggregate) has been negative for four decades and is continuing. This is a highly significant fact, because most economists think that the US saving rate is low and falling, but is still positive. In actual fact, the US saving rate has been negative for a long time and has been growing increasingly negative in recent years.

In any given period, there are many households and firms who may be savers, in the sense of making new financial investments out of their income surpluses after consumption, e.g. saving in pension plans. There are these households and also other households, firms and governments who may be borrowers by taking out new loans to supplement their income for consumption or to make new investments. The financial sector intermediates between these savers and borrowers. The net result, aggregated over all savers and borrowers, is the net saving rate for the period, which either adds to or subtracts from the total stock of national saving.

The negative saving rate of the US economy implies a constant withdrawal from the stock of saving, which is seen in Figure 3 to have started in earnest since 1980. The run-up between 2000 and 2007 and subsequent collapse in the withdrawal from the saving stock and injected into economy is likely associated with the US housing bubble inflation and subsequent deflation. The data given in current

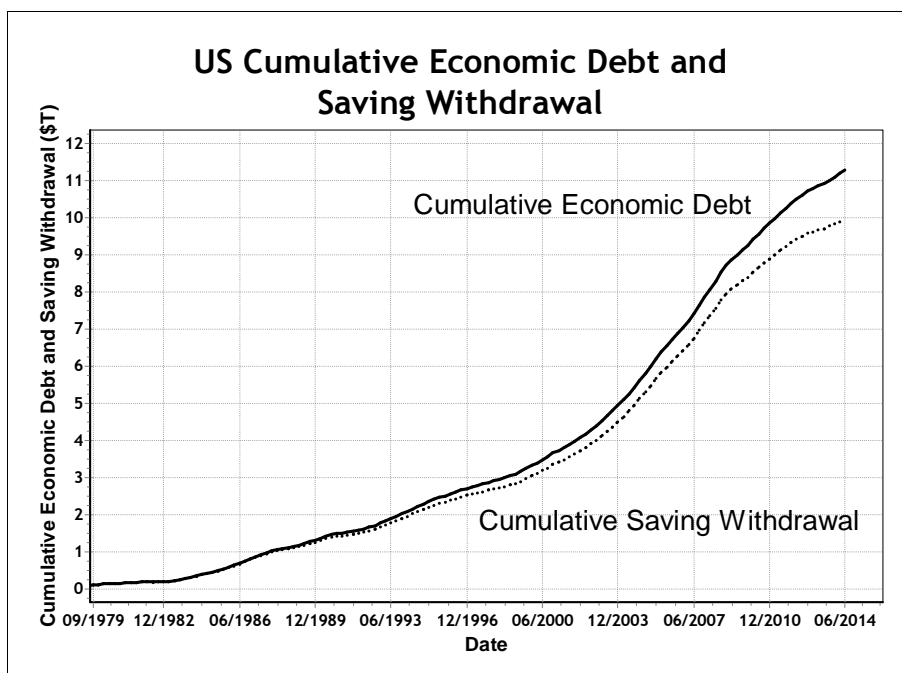
dollars show that up to \$800 billion per annum could be drawn down from past saving or current borrowing and injected into the economy as consumption or investment.

Figure 3: Withdrawal from Saving Stock



The cumulative effect of a negative saving rate is a growing withdrawal of saving now totalling more than \$10 trillion, as seen in Figure 4. Since US debt held by foreign entities is about \$6 trillion, it is likely that much of the saving withdrawal has also come from domestic sources, such as diversion from pension savings. If we assume that this saving injection into the economy leads to debt accumulation, then interest cost needs to be added to the cumulative economic debt.

Figure 4: Cumulative Withdrawal from Saving Stock



In Figure 4, it is assumed that past debt is capitalized at the 10-year Treasury bond rate, which is provided by data series H15/H15/RIFLGFCY10_N.M of the US Federal Reserve and the cumulative economic debt is the upper curve. The reason that the difference between the two curves is not as large as may be expected from compound interest is because the large accumulation of debt occurred since 2000 (see Figure 3), when interest rates had already fallen significantly. The consequence of decades of national expenditure exceeding national income and still having a growing economy is the drawdown of past saving or the accumulation of national debt.

8. Saving and Credit

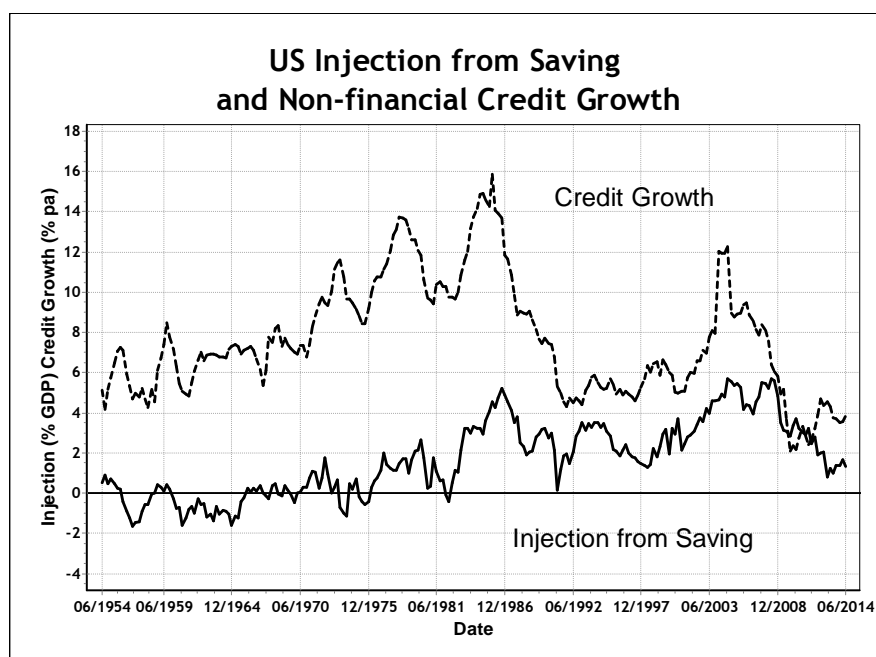
The withdrawal from the saving stock to inject into the economy is expected to be intermediated in the financial sector through debt and equity capital raising which are usually registered and reported. But there is also substantial unregistered (Ivanov and Bauguess, 2013) capital raised (\$1.7 trillion in 2012) by small businesses directly from investors for real investment and production. Hence the details of the types of saving which are injected into the economy are not always clear. However, it is assumed that debt or credit would be a significant component of the saving flow.

The US Federal Reserve provides data on financial accounts which include Z.1 dataset for many credit aggregates. Many researchers (e.g. Biggs et al, 2010) use total credit which may not be the most relevant for linking credit to the real economy. For example, some small countries such as Iceland have very large amount of credit relative to their GDP, because they have disproportionately large financial sectors which could create speculative credit unrelated to the real economy. To avoid the possible distortion from the financial sector, we consider only non-financial credit given by Series LA384104005.Q, which is the aggregate data for all non-financial sectors:

$$\text{Non-financial Credit} = \text{Household Credit} + \text{Business Credit} + \text{State and Federal Government Credit} \quad (5)$$

The data for withdrawal from the saving stock and injection into the economy used in Figure 3 is normalized to GDP and compared with the growth rate of non-financial credit in Figure 5.

Figure 5: Injection of Saving and Non-financial Credit Growth



The apparent correlation is remarkable because it shows empirically the interaction between the real and financial sectors, with data collected from different agencies as they come from those entirely different sectors. It is interesting to note that the US economy had added substantially to the national saving stock between 1954 and 1964, and between 1965 and 1975 there was little net saving nationally. Even though withdrawal from economic flow in the period from 1954 to 1964 subtracted at times nearly two percent from GDP growth, it was a period of high economic growth, albeit with high volatility (see Figure 8 below).

In contrast, since financialization from about 1975, the financial sector has channelled substantial amounts of domestic saving to inject into economic flow adding at times nearly six percent to nominal GDP growth. Yet the period since financialization has seen a secular decline in economic growth, albeit with low volatility (see below). In this period, the decline in economic production was masked by spending the stock of saving, or to express differently, by bringing forward future expenditure.

Credit growth rate may not accurately reflect the actions of the borrowers, because credit could grow simply due to interest costs even when no one is taking on new debt. To observe the true action of the participants, it is necessary to compute the new credit which is created in each period by taking into account the debt-service interest payment. The aggregate non-financial credit has an interest cost which is the average of a range of interest rates for all relevant individual loans. Without knowing the details of all those loans, we assume the average interest rate of the pool of non-financial credit is the 10-Year Treasury bond rate, in order to provide some indication of actual new credit creation over time.

A net new credit creation rate μ may be defined as the rate of additional credit created over and above that due to debt servicing at the rate r (say). The total credit increment over one period from time t to $t + 1$ is given by

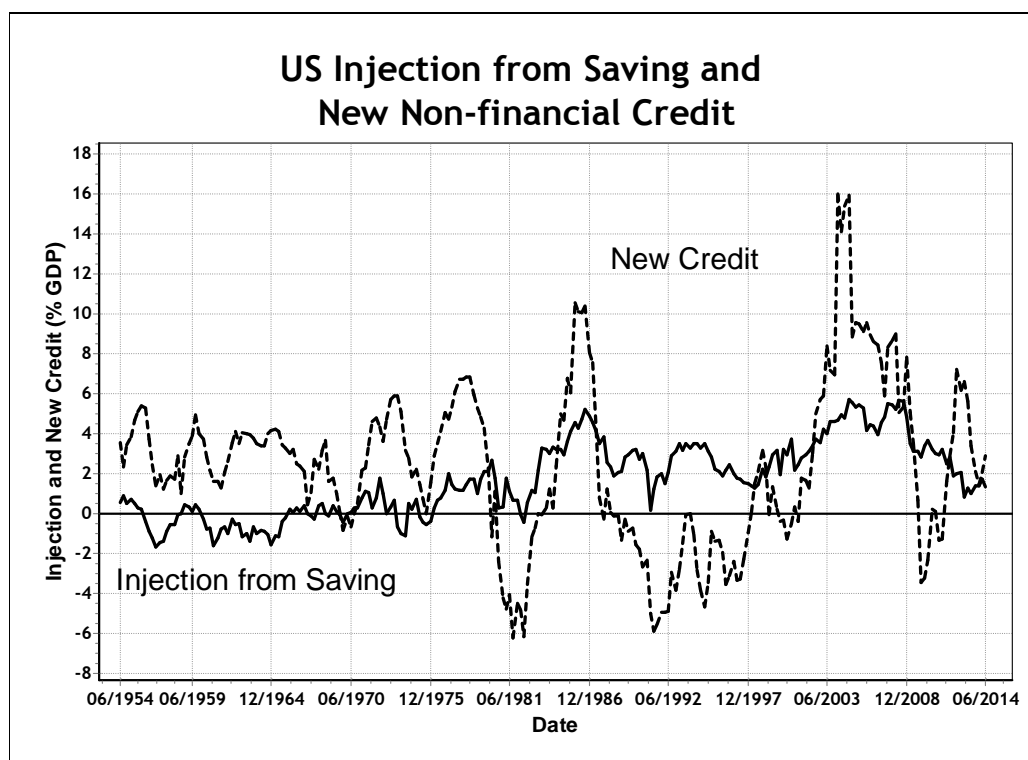
$$D_{t+1} - D_t = rD_t + \mu D_t \quad (6)$$

where D_t is the level of debt or credit at the end of period t . On rearranging,

$$\mu = \frac{D_{t+1} - D_t}{D_t} - r \quad (7)$$

where it is seen that the rate of new credit creation is equal to the rate of credit creation minus the interest rate for debt servicing. The new non-financial credit created, normalized to GDP per annum, is shown by the dotted curve in Figure 6.

Figure 6: Injection of Saving and New Non-financial Credit Growth



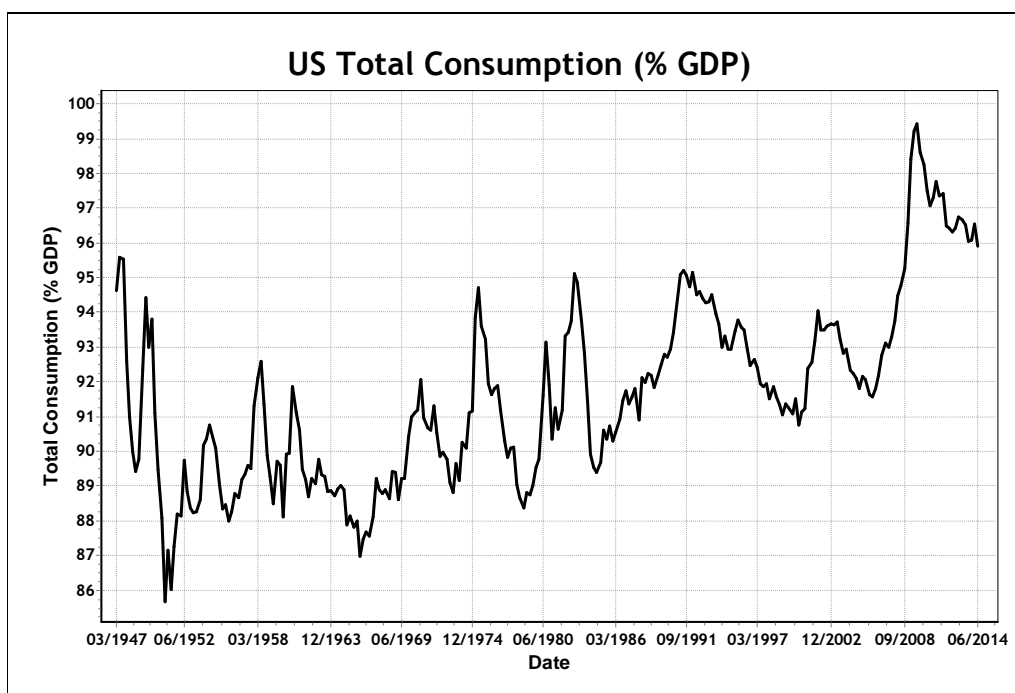
In the 1990s, the saving injected into economic flow came predominantly from equity capital raisings to fuel the technology boom and there was new credit contraction. But new credit creation to fuel the US housing bubble is evident between 2000 and 2005. This credit injection into the real economy, at times, accounted for up to nearly six percent of nominal GDP. New credit creation moderated substantially since 2005 and reached outright contraction by 2009, when the US housing bubble deflated significantly.

Since 2009, the US Federal Reserve has created nearly \$4 trillion of base money, which represents about 25 percent of nominal GDP. The monetary stimulus revived new credit creation into 2013, but has fallen since. The injection of expenditure into the economy, from withdrawal of the saving stock or from new credit creation, accounted for nearly two percent of nominal GDP growth in the recent quarters.

9. Economic Growth

In the previous paper (Sy, 2014), saving withdrawal or injection into the economic flow was neglected under the assumption of equilibrium economic flow. Under the equilibrium flow model, which applies to classical corn economy, the US economy would have collapsed in 2009, undergoing substantial economic contraction, due to over-consumption, which had then a total propensity (including private, public and capital consumption) approaching 100 percent of GDP, as seen in Figure 7.

Figure 7: Total Consumption as Propensity to Consume



If all of economic production is consumed, there would be nothing left over for investment to create new output for the next period, and the economy would contract. However, this collapse would not occur if there is sufficient injection into the economic flow from the saving stock. The economic growth rate γ would be modified (Sy, 2014) by including saving flow to read

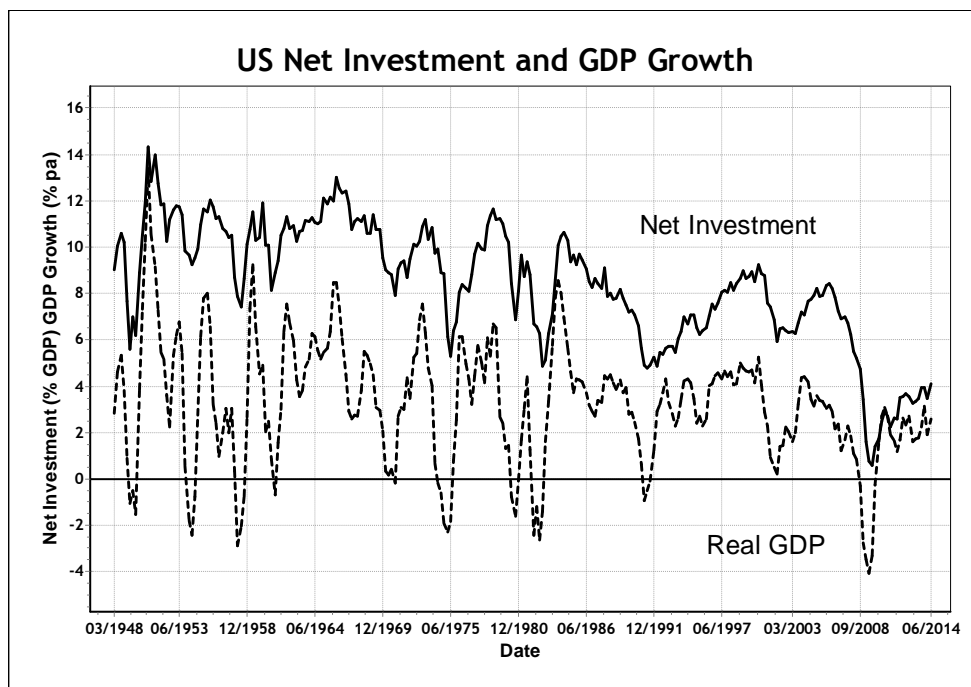
$$\gamma = \pi(1 - c) - 1 - s \quad (8)$$

where π is the investment multiplier, c is the propensity to consume and s is the propensity to save. It is seen that saving as a withdrawal from economic flow would reduce economic growth. But dis-saving or depleting the saving stock would increase economic growth. This is, of course, a simple illustration of the paradox of saving which is a rather shallow view of single-period economic management, as will be discussed below.

Note that in the equilibrium flow model ($s = 0$) the economy would be static ($\gamma = 0$) if the investment multiplier π is equal to the Keynesian multiplier: $k = 1 / (1 - c)$. The economy can also be in a dynamic stationary equilibrium of constant growth ($\gamma > 0$) provided the investment multiplier π exceeds the Keynesian multiplier k . Hence the common government policy of increasing the Keynesian multiplier k to stimulate economic growth is counter-productive, which increases the hurdle for investment efficiency to have growth (Sy, 2014).

Keynesian policies of increasing consumption and running down saving, which we will discuss further below, has led to a secular decline in investment and production, while consumption and GDP are maintained through injections from saving or borrowing. The result is a secular decline in the US economic growth, as show in Figure 8.

Figure 8: Investment and Economic Growth



The reason for US secular decline is that boosting short-term economic growth with consumption has little, if any, lasting effect from the economic multiplier, whereas investment spending has a high multiplier effect. It has been shown in the previous paper (Sy, 2014) that the so-called Keynesian multiplier effect, by increasing the propensity to consume, is not only a fallacy and counter-productive but a cause of potential economic collapse, because the Keynesian multiplier is actually a hurdle to economic growth.

10. Saving Fallacies

There are statements by economists and others which are fallacies, arising from making unwarranted assumptions and having misconceptions about saving. Wealth, by definition, is the accumulation of saving in real and financial assets. It is therefore difficult to accept how saving, at least in the sense commonly understood, could be bad for an economy.

Keynes thought saving is bad for the economy (in the Paradox of Thrift) because withdrawal of saving from economic flow reduces growth in the short-term, which is what matters most to Keynes because "in the long run we are all dead". This belief depends on how long is the "long run".

Most employees who save toward their retirement at age 65 believe that they are saving for the "long run" and, in the long run when they retire, they expect to be alive. There is a global pension crisis today, where many countries with demographically aging populations are concerned that there will be insufficient saving, either individually or collectively, to provide for the spending of those in retirement.

Yet Keynes (1936, p.376) thought savers should be "euthanized" as "capitalist rentiers", who are "functionless investors" because they invest in financial instruments usually through intermediaries:

... I am advocating, the euthanasia of the rentier, of the functionless investor, will be nothing sudden, merely a gradual but prolonged continuance of what we have seen recently in Great Britain, and will need no revolution.

The method of euthanasia Keynes was advocating was low interest rates or negative real interest rates, which is called “economic repression” in recent times, because to discourage saving and encourage investment, Keynes (1936, p.375) observed:

... a moderately high rate of interest has been found hitherto in the necessity of providing a sufficient inducement to save. But we have shown that the extent of effective saving is necessarily determined by the scale of investment and that scale of investment is promoted by a low rate of interest, provided that we do not attempt to stimulate it in this way beyond the point which corresponds to full employment.

So saving requires high interest rates while investment requires low interest rates, so Keynes advocated low interest rates. But it is inconsistent to discourage saving and encourage investment while believing “saving=investment”. In the absence of saving and therefore investment, aggregate demand can only come from consumption (see below).

The euthanasia of savers is not a cyclical process, but “a prolonged continuance”, as Summers (2011) debunked the common idea that Keynes supported counter-cyclical policy:

... a deep Keynes conviction, is that macroeconomics policy is about filling in the gaps, not smoothing the cycle. Prevailing economic theories employed in the '80s and '90s held that policy could aspire to smoothing out the cycle, but for every trough in output that was avoided you would shave off a peak level of output. The belief was that macroeconomics was about reducing the variability of output over time, not raising its average level. Keynes on the other hand focused on raising the average level of output through time by raising demand. Our current predicament makes the relevance of his ideas apparent.

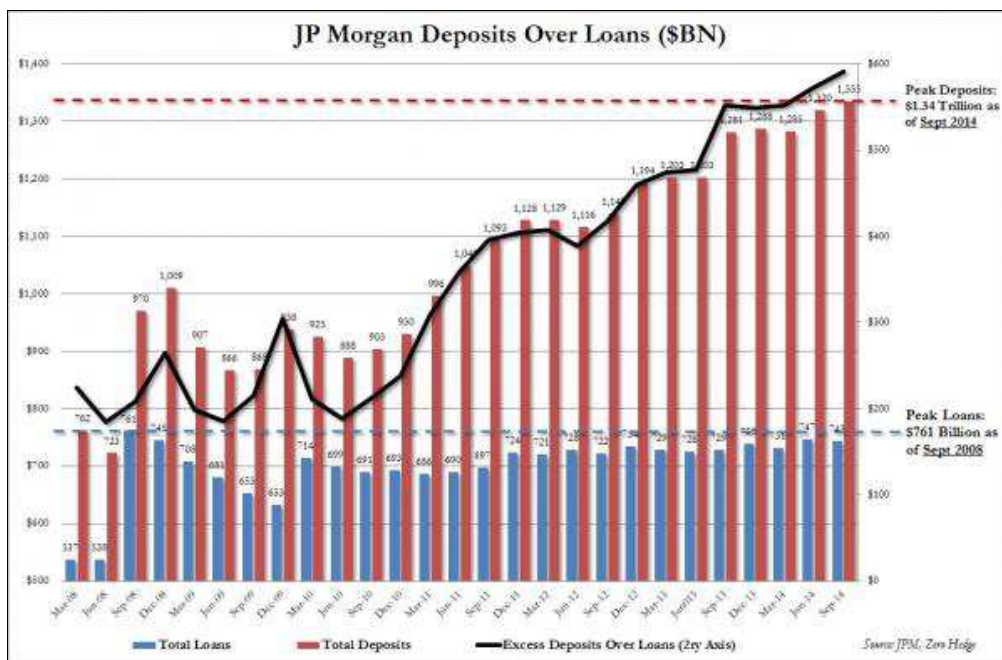
The affirmation of the idea of perpetual monetary stimulus comes from the master himself (Keynes, 1936, p.322):

Thus the remedy for the boom is not a higher rate of interest but a lower rate of interest! For that may enable the so-called boom to last. The right remedy for the trade cycle is not to be found in abolishing booms, and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keep us permanently in a quasi-boom.

Recent experience in developed countries, and globally, proves clearly that low interest rates are not sufficient to abolish slumps or maintain booms. The reason is: although low interest rates, by central bank fiat, increase artificially the value of financial claims and make the financing of real investment easier to justify, other conditions have to be satisfied such as the existence of market opportunities, risk assessment and the prospects for business profit, before economic production can pick up.

Low interest rates may make speculative profits from trading in financial instruments more attractive and more certain than making lending profits from financing business activities. The result is liquidity being trapped in the financial sector (the green rectangle in Figure 1), creating asset bubbles and resulting in a stagnant economy. Figure 9 shows (Durdan, 2014) the specific case of JP Morgan, which has made few new loans in the past several years relative to its expanding balance sheet. This specific example is consistent with the general macroeconomic data (Figure 6) showing sluggish increases in new non-financial credit creation.

Figure 9: Excess Deposits Over Loans



Hence increase in the value of financial investments (with the US stock market near all-time highs) - also known as the “wealth effect” - does not necessarily result in an increase in the amount of real investments. Low interest rates lead to under-estimation of the risk of financing real business investments and make short-term financial speculation relatively more attractive. Under such circumstances, low interest rates have been the cause, not the solution, of the liquidity trap.

If lower interest rates do not bring forth increased investment (since saving=investment), then the remedy is consumption, according to Keynes (1936, p.325):

If it is impracticable materially to increase investment, obviously there is no means of securing a higher level of employment except by increasing consumption.

After the oil supply shock of the 1970s, the US official interest rate was lowered from 19 percent in the early 1980s to near zero percent which has been kept there for the past several years. Net domestic investment fell from around nine percent of GDP to about three percent in recent years (see Figure 8). The propensity to consume total output increased from under 90 percent to nearly 100 percent (see Figure 7). At the same time, running down the stock of saving to stimulate economic growth has resulted in \$17 trillion national debt, not counting unfunded liabilities to US citizens. These developments in the US economy are substantially consistent with Keynesian recommendations.

11.The US Economy

The history of the US economy proves that the “Paradox of Thrift” is a theoretical and empirical fallacy because, in the modern economy, the financial sector (the green rectangle in Figure 1), under the influence of government policies, is more than capable of channelling all savings from individuals, corporations and pension funds back into the economic flow, as represented by the two arrows at the bottom of Figure 1.

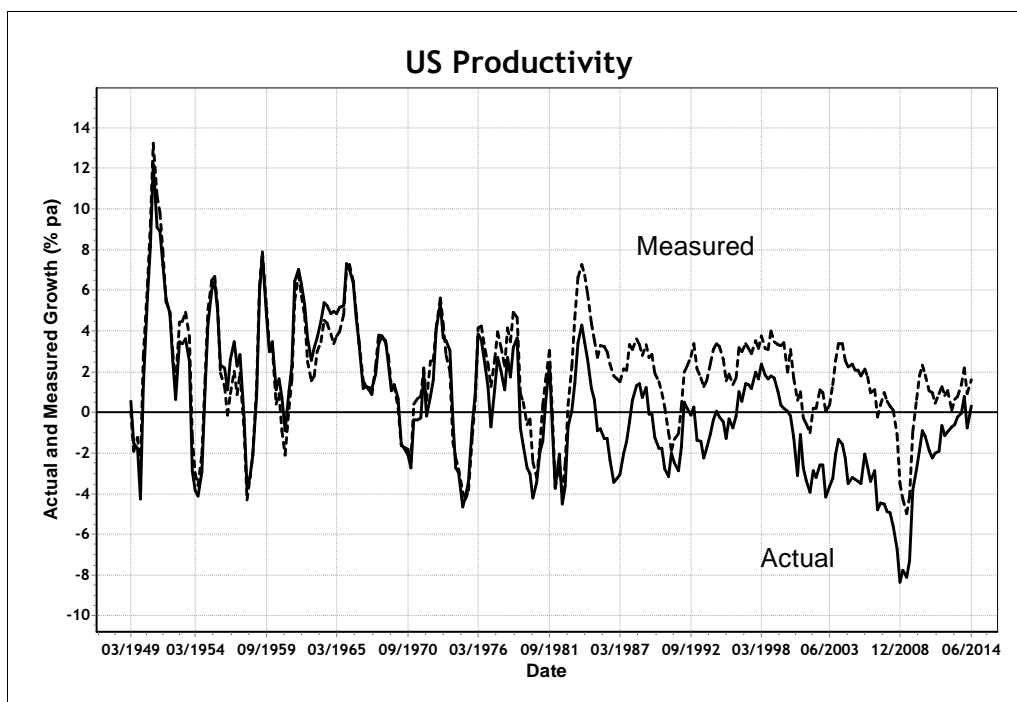
The theoretical assumption of Keynesian economics that saving (surplus) equals investment or income equals expenditure in the economic flow, is falsified by the realities of the financial sector, which has the ability to inject saving into, or to withdraw saving from, the economic flow at any time. Under government policies, the financial sector has been running down the saving stock, as well as borrowing from foreign entities, to stimulate US economic flow for the past few decades.

If saving is bad according to the “Paradox of Thrift”, then perhaps dis-saving is good – in which case the US economy should be in rude health. Not only is there a large national debt, representing high risks from mutual obligations, but the rate of US economic growth is in secular decline (see Figure 8). There is little prospect that past stimulus from dis-saving will suddenly burst out into vigorous economic growth to replenish the depleted stock of US saving. Against such optimism are indicators such as wealth inequality, the level of poverty, demographic trends of aging population, reduced educational attainment, poor public health, etc.

Over the past few decades, the US government has been spending regularly past and future saving of its citizens to provide for short-term consumption boost to the economy when it shows signs of faltering. The result is to mask the declining productivity of the US economy. The result of the pursuit of Keynesian policy is the long-term declines both in net domestic investment and in the productivity of labour. Such declines have not been widely recognized because of the rise of information technology which “obviously must” add to productivity (to be discussed elsewhere) – and because the confusion in terminology such as “saving=investment” leads to a misunderstanding in the true nature of economic growth in the US.

Since the global financial crisis (GFC) there has been heightened concern about growing wealth and income inequalities in the US and other countries. All sorts of usual suspects have been rounded up as culprits, including the inherent unfairness of capitalism, corruptness of corporatism, innovation fatigue and declining productivity. Most economists accept that measured productivity, as seen in Figure 10, is falling but still mostly positive, averaging around two percent per year. They are puzzled and perplexed to find reasons for why this has not led to higher wages and salaries.

Figure 10: Productivity Growth



Wages and salaries fell from 59 percent of gross national income (GNI) in 1970 to 49 percent recently. Yet disposable income has increased from 77 percent of GNI in 1970 to over 91 percent in 2009, due to sources other than paid work, such as transfer payments, capital income and asset income. Therefore the composition of income has shifted from production in the real economy which requires the payment of wages of salaries to employees, to the income distribution from government welfare and corporate profits in the financial sector.

Measured productivity growth rate is defined standardly as the real GDP growth rate minus the population growth rate. It has been shown in this paper that in the past few decades GDP has been increased, over and above production, by the consumption of past and future savings. This source of GDP growth does not require the hiring of workers or the payment of wages of salaries, particularly if much of the consumption is imported. Hence the measured productivity is an inflated measure of actual production, which should reflect only that part of the measured GDP related to actual production.

The actual productivity growth rate, adjusted for borrowing and spending (based on income rather than expenditure), is substantially lower as seen in the lower curve in Figure 10, showing little net productivity growth from 1970 to 2000 and significantly negative productivity growth since 2000. Negative productivity means the economy is actually producing less with more people. That is, there has been economic growth fuelled by borrowing and spending without productivity growth. Under such circumstances the standard of living should fall as there is no economic rationale for wages and salaries to increase broadly across the economy.

The financial sector - which intermediates and transfers the savings of individuals and pension funds to be borrowed and spent into the economy - earns very high fees for its efforts and accounts for most of the richest one percent of the economy. These financial capitalists are merely exploiting the economic conditions created by the US government and the US Federal Reserve. This is the main cause for the wealth and income inequality which has been accelerating in the US since 2000.

It is Keynesian economics, with its saving and investment fallacies, which has enabled the US government and the Federal Reserve to pursue harmful policies without recognizing or confronting contrary empirical evidence. The current cheerleaders of Keynesian economics, such as Kocherlakota, Summers and Krugman either have been in charge of policy or have influenced the US government to follow their advice. They find an enigma in the economic stagnation resulting from their policies and yet continue doing the same thing over and over again, expecting different results.

Having seen Fed Funds Rate lowered from 19 percent in 1980 to near zero since 2009, the President of the Federal Reserve Bank Minneapolis, Kocherlakota (2014) declared *"interest rates are not low enough"* relative to the target of two percent inflation and full employment. Summers (2011) had repeated on several occasions that *"the central irony of financial crises is that they're caused by too much borrowing, too much confidence and too much spending and they're solved by more confidence, more borrowing and more spending."*

Krugman famously said (2002), *"To fight this recession the Fed needs more than a snapback; it needs soaring household spending to offset moribund business investment. And to do that, as Paul McCulley of Pimco put it, Alan Greenspan needs to create a housing bubble to replace the NASDAQ bubble"*. Twelve years later, after the housing bubble had burst causing the current economic crisis, Krugman (2013) is joining Summers (2013) in calling for negative nominal interest rates, stating:

...we are an economy in which monetary policy is de facto constrained by the zero lower bound (even if you think central banks could be doing more), and that this corresponds to a situation in which the “natural” rate of interest – the rate at which desired savings and desired investment would be equal at full employment – is negative.

Some European countries have already implemented negative nominal interest rate policies, though not yet in the US. It is beyond the scope of this paper to discuss monetary policy, which is a subject for the future. But when you find yourself in a Keynesian hole, it would seem that the sensible thing to do is to stop digging, rather than dig more furiously as the zealots have been doing or for the past few decades. Established trends are likely to continue until policy is forced to change by the catastrophic circumstances which could occur anytime.

12. Conclusion

Let us review what has been achieved and summarize the key findings. Within the basic macroeconomic framework of equilibrium flow created by Keynes (1936), so-called “saving” has been redefined as unconsumed surplus in this paper. A new, different and accurate meaning of saving has been introduced and defined as income minus expenditure in an economy with disequilibrium flow. Greater distinction has been introduced between real and financial and between flow and stock, to interpret the empirical data.

But our modifications to the existing framework do not constitute a new economic theory requiring any new assumptions about how the economy works. New economic theory has not been the intention of this paper. Instead, the aim achieved in this paper is to obtain a coherent understanding of the available macroeconomic data of the United States. Understanding the facts of observation is a pre-condition in science to the building of a useful theory - which may be a future undertaking.

The newly clarified concepts of saving and investment have led to a number of startling stylized facts of observation. The Keynesian fallacy of “saving=investment” originated from confounding meanings within an equilibrium assumption, which is not an actual state supported by the facts of observation. Once the equilibrium assumption is abandoned, it has been possible to observe several disequilibrium trends developing in the US economy over the past few decades.

The US aggregate saving rate has been substantially negative (not just low) for over three decades leading to a depletion of the national saving stock. Even Greenspan has admitted recently, “We are eating our seed corn” (Long, 2014). The propensity to consume has trended higher to near 100 percent at times in recent years while net domestic investment has trended lower, leading to a secular decline in US economic growth despite continual injection of saving or new credit to stimulate the economic flow. Productivity growth has been substantially negative (not just low) since the start of the millennium, possibly explaining the problems of wealth inequality, low employment, and stagnant wages and salaries.

These facts of observation constitute a vision of the US economy which is at great variance to the commonly held view of a weak US economy recovering rather than a stagnating or even a collapsing one. Our refutation of Keynesian economics is not based on differences of theory or opinion as other critics have voiced (Hazlitt, 1977). Rather, it is based on a different view of the facts. These differences can be resolved, with our view being either verified or refuted by other independent analyses of the data. This is needed, because agreement to the facts is essential to the foundation

of a scientific economic theory – as we need to agree on what to explain. Readers are therefore urged to take up this task.

Government fiscal policy should have a significant impact on total consumption, while monetary policy strongly influences the financial sector in its intermediation of saving. These topics deserve a more detailed investigation in the future. Similar macroeconomic developments may have been occurring in other countries, particularly in Japan and in Europe, because they appear to have followed similar Keynesian policies. Macroeconomic data of these countries should be investigated under our newly modified framework to establish any general empirical pattern.

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