Evidence For a Causal Relationship Between Profit and the Economic Cycle

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Abstract

This paper provides evidence from the United Kingdom's national accounts since 1955 for a causal relationship between profit and the economic cycle. It illustrates a correlation between profit, income, expenditure, saving and investment in terms of a simple algebraic equation. This equation demonstrates that the rate of increase of profit relative to the rate of increase of income affects the behaviour of saving relative to investment and income relative to expenditure, thereby affecting the balancing of the economic cycle. The economic cycle is measured in terms of the current account balance and all data is from or derived from the Office for National Statistics. Present macroeconomic theory takes no account of the possibility of this causal relationship. The conclusion drawn from the evidence is that in order for income and expenditure to balance over the economic cycle the rate of profit growth must equal the rate of income growth in an economy.

Key words: profit, gross national income, expenditure, saving, investment, economic cycle, relationship, correlation, imbalances.

Introduction

Evidence for a causal relationship between profit and the economic cycle exists in a correlation between profit, gross national income, expenditure, saving and investment in the UK national accounts. This correlation can best be illustrated mathematically using one of two forms of a simple equation, depending on whether the cycle is measured from peak to peak or trough to trough. The economic cycle is measured in terms of the current account balance, which is the difference between gross national income, adjusted for current transfer payments, and expenditure. The trough of the cycle occurs where expenditure most exceeds income and it is most in deficit; the peak occurs where it is least in deficit or, in the case of a surplus, where income most exceeds expenditure.

$$\frac{\Delta\pi}{\Delta GNI} = \frac{[\frac{\Delta GNI}{\Delta EXP}]}{[\frac{\Delta EXP}{\Delta GNI}]} \div \frac{[\frac{\Delta I}{\Delta S}]}{[\frac{\Delta S}{\Delta I}]}$$

If the economic cycle is measured from peak to peak the above form of the equation is used, if it is measured from trough to trough the below form is used where the above relationships between income and expenditure and investment and saving are inverted. Different permutations of these equations may be used in analysing the economic cycle, but the fundamental relationship between the variables remains the same.

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$$\frac{\Delta\pi}{\Delta GNI} = \frac{[\frac{\Delta EXP}{\Delta GNI}]}{[\frac{\Delta GNI}{\Delta EXP}]} \times \frac{[\frac{\Delta S}{\Delta I}]}{[\frac{\Delta I}{\Delta S}]}$$

π = gross operating surplus (profit)
Δ = rate of change or increase
EXP = expenditure (GDP +/- trade balance, or consumption + I + inventories + valuables)
GNI = gross national income
S = saving (GNI – consumption, or gross saving +/– current transfers payments[i])
I = total gross fixed capital formation (investment)

In the equations the economic cycle is divided into two halves. In the case of the cycle running from peak to peak the first half is measured from peak to trough and the second half from trough to peak. If the cycle runs from trough to trough the first half is measured from trough to peak and the second half from peak to trough. The values for gross national income, expenditure, saving and investment are taken from these turning points of the economic cycle. The relationships between the rate of increase of GNI relative to the rate of increase of expenditure and the rate of increase of investment relative to the rate of increase of saving in the first half are divided by their inverse relationships in the second half.

The top fractions in brackets, the numerators of the larger fractions, represent the first half of the economic cycle, while the bottom fractions, the denominators, represent the second half. Whether the relationship between income and expenditure over the cycle is multiplied or divided by the relationship between saving and investment over the cycle depends on which method will give a value equal to that of the relationship between profit and income during the first half of the cycle (usually greater than one). If the economic cycle were to balance perfectly the value of the relationships between the variables in the first half of the cycle would be equal to the value of their inverse relationships in the second half, in order to give a value of 1.

The rate of change of profit relative to the rate of change of GNI is measured in terms of the profit/GNI cycle, which, under a floating exchange rate system, follows the economic cycle relatively closely. The profit/GNI cycle seems to run between economic slowdowns. As a normal economic cycle under floating exchange rates begins and ends with a slowdown and includes one in the middle, there are usually two corresponding profit cycles. The UK's membership of the European ERM, a fixed exchange rate mechanism, from 1990 – 1992 did not affect this. Under the conditions of fixed exchange rates, such as Bretton-Woods the profit/GNI cycle's relationship with the economic cycle alters and there is a less close correlation between the two.

Under floating exchange rates the complete profit/GNI cycle which corresponds most closely with the first half of the economic cycle is measured, as this affects the rebalancing of the second half of the economic cycle. In other words, the change in the value of profit relative to the change in the value of GNI is measured from peak to peak over the full profit/GNI cycle, not in halves as in the case of the economic cycle. The fact that the second peak of the profit/GNI cycle is mostly higher than the first means the value of the ratio will be greater than one, meaning that over the cycle profit is increasing faster than income. The 1966 – 1977 and 1973 – 1980 profit/GNI cycles are an exception to this as will be explained below. There is also an anomaly in the peak of

the profit/GNI cycle in 1985 as this does not indicate the end of the cycle. This exception cannot be explained and is hopefully a statistical error.

The above equations do not hold if other measures of income and saving are used. This is possibly because gross national income provides a more accurate figure for a country's income than gross domestic product. The above measure of saving may also be more accurate than gross saving in that it factors in net current transfer payments which could have a distorting effect on a country's savings levels.

All data used in the equations are from, or derived from, Office for National Statistic's data sets for the Blue and Pink Books 2012. They are at current prices and not seasonally adjusted, apart from GDP (YBHA) which is seasonally adjusted.

The UK Economic Cycle From 1981 – 1997

In the UK economic cycle from 1981 – 1997, measured from peak to peak, the current account deficit reached its largest value in 1989, marking the turning-point of the cycle (see column G of the table on pg.14). Between 1981 and 1989 gross national income (GNI) increased 2.0769 times from 250 912 million pounds to 521 130 million pounds, expenditure increased 2.1950 times from 248 426 million pounds to 545 299 million pounds, saving increased 2.1972 times from 41 864 million pounds to 91 985 million pounds and investment increased 2.5940 times from 43 746 million pounds to 113 478 million pounds.

In the second half of the cycle from 1989 – 1997 GNI increased 1.5961 times from 521 130 million pounds to 831 780 million pounds, expenditure increased 1.5217 times from 545 299 million pounds to 829 756 million pounds, saving increased 1.5811 times from 91 985 million pounds to 145 440 million pounds and investment increased 1.2228 times from 113 478 million pounds to 138 765 million pounds (see columns B, C, D, E).

In this case the profit/GNI cycle is measured from 1977 to 1988 (the spike in 1985 appears to be an anomaly). During this period profit increased 3.6193 times from 37 028 million pounds to 134 014 million pounds, and GNI increased 3.2861 times from 144 777 million pounds to 475 754 million pounds (see columns F, A, B). If the above values are entered into the first version of the equation the following answer is obtained.

$$\frac{\Delta\pi}{\Delta GNI} = \frac{\left[\frac{\Delta GNI}{\Delta EXP}\right]}{\left[\frac{\Delta EXP}{\Delta GNI}\right]} \div \frac{\left[\frac{\Delta I}{\Delta S}\right]}{\left[\frac{\Delta S}{\Delta I}\right]}$$

$$\frac{3.6193}{3.2861} = \frac{\left[\frac{2.0769}{2.1950}\right]}{\left[\frac{1.5217}{1.5961}\right]} \div \frac{\left[\frac{2.5940}{2.1972}\right]}{\left[\frac{1.5811}{1.2228}\right]}$$

$$1.1014 = 1.0868$$

As saving and investment are smaller components of income and expenditure respectively, larger changes in the ratios of saving and investment over the cycle have a smaller effect on the ratios of income and expenditure. This relationship is also affected by the ratio of profit to income, as can be seen from the above equation. The value of the imbalances between saving, investment, income and expenditure over the economic cycle is almost equal to the rate at which profit growth has exceeded income growth over the first half of the economic cycle. If the values from the 2011 data sets are

entered into the equation it balances even more closely with 1.0896 = 1.0862. Hopefully, the greater discrepancy in 2012 is the result of statistical error.

The UK Economic Cycle From 1989 – 2006

If the UK economic cycle is measured from trough to trough from 1989 – 2006, with 1997 when the economy was closest to being in surplus marking the turning-point of the cycle, the second version of the equation is used. In the first half of the cycle from 1989 – 1997 GNI increased 1.5961 times from 521 130 million pounds to 831 780 million pounds, expenditure increased 1.5217 times from 545 299 million pounds to 829 756 million pounds, saving increased 1.5811 times from 91 985 million pounds to 145 440 million pounds and investment increased 1.2228 times from 113 478 million pounds to 138 765 million pounds.

In the second half of the cycle from 1997 – 2006 GNI increased 1.6106 times from 831 780 million pounds to 1 339 645 million pounds, expenditure increased 1.6488 times from 829 756 million pounds to 1 368 141 million pounds, saving increased 1.4040 times from 145 440 million pounds to 204 193 million pounds and investment increased 1.6362 times from 138 765 million pounds to 227 045 million pounds.

The relevant profit/GNI cycle to the first half of the economic cycle runs from 1988 – 1997. During this period profit increased 1.8943 times from 134 014 million pounds to 253 861 million pounds, and GNI increased 1.7483 times from 475 754 million pounds to 831 780 million pounds. If the above values are entered into the second version of the equation the following answer results.

$$\frac{\Delta\pi}{\Delta GNI} = \frac{[\frac{\Delta EXP}{\Delta GNI}]}{[\frac{\Delta GNI}{\Delta EXP}]} \times \frac{[\frac{\Delta S}{\Delta I}]}{[\frac{\Delta I}{\Delta S}]}$$

$$\frac{1.8943}{1.7483} = \frac{[\frac{1.5217}{1.5961}]}{[\frac{1.6106}{1.6488}]} \times \frac{[\frac{1.5811}{1.2228}]}{[\frac{1.6362}{1.4040}]}$$

$$1.0835 = 1.0829$$

The correlation between the faster increase in profit relative to income over the first half of the economic cycle and the value of the imbalances between saving, investment, income and expenditure over the complete economic cycle is almost exact.

The UK Economic Cycle From 1971 – 1981

The above section deals with the overlapping UK economic cycles from 1981 – 2006, predominantly under floating exchange rates. However, the era of floating exchange rates began in 1971 with the collapse of the Bretton-Woods agreement on fixed exchange rates. The economic cycle from 1971 – 1981 was a ‘false start’ though, in that the imbalances in the UK economy were so great that it was forced to rebalance through recession at the end of the cycle. This meant a decline in investment and consumption related imports rather than an increase in saving related exports. In other words, the recession came before the cycle had finished rather than at its end.

This was partly due to western governments being too lax with the money supply under the conditions of greater monetary freedom, but mainly because of the huge imbalances caused by the oil price shock of the early 1970s. The rapid increase in the price of oil and too low interest rates inflated consumption in the UK, while exaggerating saving and supressing consumption in the surplus economies, especially the oil-producing nations. When the economic cycle turned after 1974 there was not enough foreign demand to ensure sustainable export and investment-led growth in the UK economy, despite the devaluation of the pound in 1976. The economy limped in and out of growth until 1980 when it finally succumbed to outright recession.

In the UK economic cycle from 1971 – 1981, measured from peak to peak with 1974 marking the turning-point, the first form of the equation is used. However, the relationship of income and expenditure with saving and investment is multiplied because the value of the latter over the cycle is greater than one, while the value of the former is less than one. Therefore, to divide the relationship between income and expenditure by the relationship between saving and investment over the cycle would give a value of less than one, the value of the rate of increase of income relative to the rate of increase of profit rather than the other way round.

In the first half of the economic cycle from 1971 – 1974 GNI increased 1.4647 times from 57 926 million pounds to 84 844 million pounds, expenditure increased 1.5559 times from 56 832 million pounds to 88 424 million pounds, saving increased 1.2185 times from 12 211 million pounds to 14 879 million pounds and investment increased 1.6127 times from 11 286 million pounds to 18 201 million pounds.

In the second half of the cycle from 1974 – 1981 GNI increased 2.9573 times from 84 844 million pounds to 250 912 million pounds, expenditure increased 2.8095 times from 88 424 million pounds to 248 426 million pounds, saving increased 2.8136 times from 14 879 million pounds to 41 864 million pounds and investment increased 2.4035 times from 18 201 million pounds to 43 746 million pounds.

The profit/GNI cycle relevant to the first half of the economic cycle runs from 1966 – 1977. Over this period profit increased 4.2318 times from 8 750 million pounds to 37 028 million pounds, and GNI increased 3.7685 times from 38 418 million pounds to 144 777 million pounds. The profit/GNI cycle is measured here from trough to peak, rather than from peak to peak, because the previous cycle had run from trough to trough due to the different nature of the profit/GNI cycle under a fixed exchange rate mechanism. The effects on the profit cycle of Bretton-Woods, which only ended in 1971, are discussed in more detail below. If the above values are entered into the first form of the equation the following answer results.

$$\frac{\Delta\pi}{\Delta GNI} = \frac{\left[\frac{\Delta GNI}{\Delta EXP}\right]}{\left[\frac{\Delta EXP}{\Delta GNI}\right]} \times \frac{\left[\frac{\Delta I}{\Delta S}\right]}{\left[\frac{\Delta S}{\Delta I}\right]}$$

$$\frac{4.2318}{3.7685} = \frac{\left[\frac{1.4647}{1.5559}\right]}{\left[\frac{2.8095}{2.9573}\right]} \times \frac{\left[\frac{1.6127}{1.2185}\right]}{\left[\frac{2.8136}{2.4035}\right]}$$

$$1.1229 = \left[\frac{0.9414}{0.9500}\right] \times \left[\frac{1.3235}{1.1706}\right]$$

$$1.1229 = 0.9909 \times 1.1306$$

$$1.1229 = 1.1203$$

Over the cycle the only way for saving to balance with investment, and therefore income with expenditure, without a decrease in consumption or investment expenditure was for saving related exports to increase faster than consumption related imports. The ratio of the increase of saving relative to the increase of investment in the second half of the cycle must therefore be at least equal to the ratio of the increase of investment relative to the increase of saving in the first half. This was not the case, as the former was 1.1706 compared to the latter which was 1.3235. This gives a ratio of 1.1306 to the relationship between the two over the cycle. In order for the UK economy to have escaped rebalancing through recession the ratio would have had to have been at least one or less than one. This belies the fact that gross saving was greater than investment due to income exceeding expenditure and the trade and current account balances being in surplus. However, saving, as measured here by GNI minus consumption and used in the above equation, was not greater than investment due to the negative influence of current transfer payments on gross saving. This indicates that the economy had only nominally rebalanced and proper liquidity had not been restored.

There is a danger that the UK economy is in a similar position today. The extreme global imbalances at present suggest there will not be enough foreign demand to provide sustainable export-driven growth for the UK economy, causing it to fall back into recession prematurely. However, the scale of the imbalances and levels of debt in the global economy are far greater than in the 1970s.

The UK Economic Cycle From 1974 – 1989

The UK economic cycle from 1974 – 1989 is the most difficult to explain, this is possibly because of the unusual behaviour of the first half of the cycle from 1974 – 1981. This half of the cycle did not experience export-driven growth of sufficient strength to sustain the recovery after the 1976 devaluation of the pound, as should have occurred. The economy was therefore forced to rebalance through a double-dip recession, with a recessionary decline in expenditure and investment growth rather than an export-related increase in income and saving. To reflect this change in the behaviour of income and saving relative to expenditure and investment the form of the equation used is the same as if the cycle was measured from peak to peak rather than from trough to trough.

The fact that the UK economy was forced to rebalance through recession also affects the measurement of the profit/GNI cycle. It is not measured from peak to peak as is usual under floating exchange rate conditions, as the peak in 1977 is not regarded as delineating the end of the cycle due to the following recession. Instead it is measured from the first peak after 1966, which is 1973, to the recessionary trough in 1980 which is taken as the end of the profit/GNI cycle.

If the UK economic cycle is measured from trough to trough from 1974 – 1989, with 1981 when the economy was most in surplus marking the turning point, the first version of the equation is used. In the first half of the cycle from 1974 – 1981 GNI increased 2.9573 times from 84 844 million pounds to 250 912 million pounds, expenditure increased 2.8095 times from 88 424 million pounds to 248 426 million pounds, saving increased 2.8136 times from 14 879 million pounds to 41 864 million pounds and investment increased 2.4035 times from 18 201 million pounds to 43 746 million pounds.

In the second half of the cycle from 1981 – 1989 GNI increased 2.0769 times from 250 912 million pounds to 521 130 million pounds, expenditure increased 2.1950

times from 248 426 million pounds to 545 299 million pounds, saving increased 2.1972 times from 41 864 million pounds to 91 985 million pounds and investment increased 2.5940 times from 43 746 million pounds to 113 478 million pounds.

The profit/GNI cycle relevant to the first half of the economic cycle runs from the peak in 1973 to the trough in 1980, for the reason given above. During this period profit increased by 3.0474 times from 18 135 million pounds to 55 265 million pounds, and GNI increased by 3.0437 times from 74 926 million pounds to 228 055 million pounds. If the above values are entered into the first form of the equation the following answer results.

$$\frac{\Delta\pi}{\Delta GNI} = \frac{\left[\frac{\Delta GNI}{\Delta EXP}\right]}{\left[\frac{\Delta EXP}{\Delta GNI}\right]} \times \frac{\left[\frac{\Delta I}{\Delta S}\right]}{\left[\frac{\Delta S}{\Delta I}\right]}$$

$$\frac{3.0474}{3.0437} = \frac{\left[\frac{2.9573}{2.8095}\right]}{\left[\frac{2.1950}{2.0769}\right]} \times \frac{\left[\frac{2.4035}{2.8136}\right]}{\left[\frac{2.1972}{2.5940}\right]}$$

$$1.0012 = \left[\frac{1.0526}{1.0569}\right] \times \left[\frac{0.8542}{0.8470}\right]$$

$$1.0012 = 1.0044$$

The relationship between profit and income growth once again almost exactly mirrors the value of the relationships between income, expenditure, saving and investment over the economic cycle.

The UK Economic Cycles From 1955 – 1967 Under the Fixed Exchange Rate Mechanism of Bretton Woods

Under the fixed exchange rate system of Bretton-Woods the relationship between the economic cycle and the profit cycle differed in that there was much less of a close correlation between the two. The economic cycle is measured from trough to trough from 1955 onwards, and there are two (possibly three) full cycles between then and 1967, which marks the devaluation of the pound. The trough in 1964 is not treated as delineating a separate cycle, as will be explained later. These cycles are relatively short compared to the relevant profit/GNI cycle which ran from trough to trough from 1950 – 1966, reaching its peak and turning-point in 1960. The lesser peak and trough of 1954 and 1957 respectively are regarded as ‘blips’ in this longer cycle.

Instead of shorter profit/GNI cycles being subsumed by longer economic cycles, as occurs under the conditions of floating exchange rates, the maximisation of profit under a fixed exchange rate system has the opposite effect, creating a longer profit/GNI cycle which subsumes both smaller economic cycles. Under a fixed exchange rate system profit cycles seem to run between currency devaluations, and here it runs from trough to trough between the devaluations of 1949 and 1967. This is because the Bretton-Woods system was supposed to ensure greater economic stability – no serious imbalances, ‘booms’ or ‘busts’ were allowed. After the devaluation of 1949 the fixed exchange rate mechanism managed to keep serious recession and imbalances at bay for most of its duration, although there were slight recessions in 1956, 1957 and 1961. Surprisingly there does not appear to have been a recession in 1967. The first recession in the UK after the collapse of Bretton-Woods in 1971 came at the end of 1973.[ii]

However, the fact that the rates of growth of income and expenditure were more balanced during this period belied the growing dislocation between saving and investment, which finally came to a head between 1962 and 1967. This dislocation was most likely caused by the increasing divergence between the rates of profit and income growth between 1950 and 1960, which stretched the system to breaking point. It is likely that if the rate of profit growth had been equal to the rate of income growth the relationship between saving and investment would have been far more balanced.

In the UK economic cycle from 1955 – 1960, measured from trough to trough, 1958 marks the turning-point as the current account balance was most in surplus. In the first half of the cycle from 1955 – 1958 GNI increased 1.1869 times from 19 612 million pounds to 23 277 million pounds, expenditure increased 1.1586 times from 19 763 million pounds to 22 897 million pounds, saving increased 1.2928 times from 3 231 million pounds to 4 177 million pounds and investment increased 1.2307 times from 3 026 million pounds to 3 724 million pounds.

In the second half of the cycle from 1958 – 1960 GNI increased 1.1230 times from 23 277 million pounds to 26 140 million pounds, expenditure increased 1.1503 times from 22 897 million pounds to 26 338 million pounds, saving increased 1.1915 times from 4 177 million pounds to 4 977 million pounds and investment increased 1.1729 times from 3 724 million pounds to 4 368 million pounds. If the above values are entered into the second form of the equation, without reference to the rate of profit/GNI growth for the time being, the following result is obtained showing the product of the imbalances between saving, investment, income and expenditure.

$$\frac{[\frac{\Delta EXP}{\Delta GNI}]}{[\frac{\Delta GNI}{\Delta EXP}]} \times \frac{[\frac{\Delta S}{\Delta I}]}{[\frac{\Delta I}{\Delta S}]}$$

$$= \frac{[\frac{1.1586}{1.1869}]}{[\frac{1.1230}{1.1503}]} \times \frac{[\frac{1.2928}{1.2307}]}{[\frac{1.1729}{1.1915}]}$$

$$= \frac{0.9762}{0.9763} \times \frac{1.0505}{0.9844}$$

$$= 1.0670$$

The consecutive cycle ran from 1960 – 1967, also measured from trough to trough, with the turning-point being 1962. The trough in 1964 can be treated as dividing this cycle into two smaller separate cycles, running respectively from 1960 – 1964 and 1964 – 1967. If this is done the values of their respective imbalances between income, expenditure, saving and investment are 1.0679 and 1.0625 – the product of which equals 1.1346. This is almost exactly equal to the value of the relationship between the imbalances if the period from 1960 – 1967 is measured as a single cycle. For reasons of simplicity these two smaller cycles have been measured cumulatively.

In the first half of the cycle from 1960 – 1962 GNI increased 1.1077 times from 26 140 million pounds to 28 955 million pounds, expenditure increased 1.0920 times from 26 338 million pounds to 28 761 million pounds, saving increased 1.0653 times from 4 977 million pounds to 5 302 million pounds and investment increased 1.1559 times from 4 368 million pounds to 5 049 million pounds.

In the second half of the cycle from 1962 – 1967 GNI increased 1.3989 times from 28 955 million pounds to 40 506 million pounds, expenditure increased 1.4158 times from 28 761 million pounds to 40 720 million pounds, saving increased 1.5041

times from 5 302 million pounds to 7 975 million pounds and investment increased 1.5736 times from 5 049 million pounds to 7 945 million pounds.

As stated above the profit/GNI cycle ran from 1950 – 1966, but it is only measured from its trough in 1950 to its peak in 1960 during which profit increased faster than income. It is this discrepancy between profit and income which appears to affect the growing imbalance between saving and investment which came to a head in 1967, despite the close balance between income and expenditure. Ironically, the relationship between the divergence of both profit and income and saving and investment appears to have had a moderating influence on income and expenditure allowing them to remain relatively balanced. The imbalance between saving and investment only became significant after the profit/GNI cycle had peaked in 1960 and was in decline. Between 1950 and 1960 profit increased 2.1714 times from 3 208 million pounds to 6 966 million pounds, while GNI increased 1.9129 times from 13 665 million pounds to 26 140 million pounds. If the above values are entered into the second form of the equation the following result is obtained.

$$\frac{\Delta\pi}{\Delta GNI} = \frac{\left[\frac{\Delta EXP}{\Delta GNI}\right]}{\left[\frac{\Delta GNI}{\Delta EXP}\right]} \div \frac{\left[\frac{\Delta S}{\Delta I}\right]}{\left[\frac{\Delta I}{\Delta S}\right]}$$

$$\frac{2.1714}{1.9129} = \frac{\left[\frac{1.0920}{1.1077}\right]}{\left[\frac{1.3989}{1.4158}\right]} \div \frac{\left[\frac{1.0653}{1.1559}\right]}{\left[\frac{1.5736}{1.5041}\right]}$$

$$1.1351 = \left[\frac{0.9858}{0.9881}\right] \div \left[\frac{0.9216}{1.0462}\right]$$

$$1.1351 = 1.1326$$

The value of the imbalances between saving, investment, income and expenditure of the second economic cycle has increased from that of the first cycle to almost precisely equal the imbalance between profit and income growth from 1950 – 1960. The fact that the increase in saving was too slow relative to the increase in investment between 1960 and 1962, the first half of the second cycle, meant that saving levels were not high enough to meet the demand for investment in the second half of the cycle from 1962 to 1967. This is despite saving having increased as a proportion of income from 1955 to 1967. The increase in saving relative to the increase in investment had fallen from a ratio of 1.0505 in the first half of the first cycle to a ratio of 0.9216 in the first half of the second cycle. These were the export-led parts of the cycle when saving should have been increasing faster than investment. Between 1960 and 1962, the first half of the second cycle, saving fell counter-cyclically as a proportion of income from 19.04% to 18.31%, while consumption and investment both rose.

When the cycle turned after 1962 it was not possible under the fixed exchange rate mechanism to borrow any more money from abroad. Neither was it possible to lower interest rates to compensate for the shortfall in saving without transgressing the terms of Bretton-Woods. There was only one way out and in November 1967 the pound devalued by 14%.[iii] Possibly a similar situation in 1971 in the United States led to the devaluation of the dollar, which finally brought an end to the Bretton-Woods agreement. The devaluation of the pound in 1967 occurred when the current account deficit was actually slightly lower than it had been in 1964. This is possibly because it had more to do with the relative size of the changes of the variables involved, principally saving and investment, rather than their actual values.

Conclusion

Hopefully, the above equations, as applied to the UK economy from 1955 to 2006, go some way to providing sufficient empirical evidence to establish a causal relationship between the rates of profit and income growth and the imbalances between saving, investment, income and expenditure over the economic cycle. The almost precise correlation of the divergence between the growth of profit and income and these imbalances implies that for saving to balance with investment, and therefore income with expenditure, the rate of profit growth must equal the rate of income growth. This would give the ratio of profit to gross national income a constant value of one, thereby nullifying the profit/GNI cycle and preventing it from having a distorting effect on the other variables involved.

Instead of interest rates and government fiscal measures being used to influence factors such as output, investment, saving, consumption and profit, it seems that the former would be better regulated by improved understanding of the latter, in particular the rate of profit. If each firm in a national economy were to equalise their respective rates of profit and income growth, thereby equalising the two across the whole economy, consumption, saving and investment levels would no longer be distorted and debt bubbles would be prevented. This would mean a more balanced economic cycle without ‘booms’ or ‘busts’, meaning no net decline in interest rate levels and growing structural government budget deficits.

Appendix

The figures in the table below are from or derived from the Office for National statistics Blue and Pink Books' 2012 datasets.

A) ABNF – Gross Operating Surplus (profit): Total: £m CP NSA
B) ABMX – Gross National Income: £m CP NSA
C) EXP – Expenditure (YBHA +/- KTMY)
D) SAV – Saving (ABMX - ABKW)
E) NPQX – Total Gross Fixed Capital Formation (investment): £m CP NSA
F) π/GNI % – (ABNF/ABMX)
G) HBOG – B o P Current Account Balance: £m NSA
H) ABKW – Total Final Consumption Expenditure: £m CP NSA
I) KTMY – B o P Total Trade in Goods and Services: Balance: £m CP NSA
J) YBHA – Gross Domestic Product at market prices: £m CP SA

	A)ABNF	B)ABMX	C)EXP	D)SAV	E)NPQX	F)π/GNI %	G)HBOG	H)ABKW	I)KTMY	J)YBHA
1946							-153	2316	-375	
1947							-311	1783	-555	
1948	2913	12177	12189	1731	1502	23.9221	83	10446	-216	11973
1949	3179	12912	12903	1876	1662	24.6205	35	11036	-180	12723
1950	3208	13665	13361	2049	1799	23.4760	338	11616	-58	13303
1951	3583	15085	15437	2338	2011	23.7521	-330	12747	-660	14777
1952	4135	16192	16131	2427	2265	25.5373	229	13765	-149	15982
1953	4479	17302	17247	2713	2540	25.8872	204	14589	-121	17126
1954	4778	18324	18224	2968	2741	26.0751	160	15356	-95	18129
1955	4919	19612	19763	3231	3026	25.0816	-108	16381	-273	19490
1956	5121	21129	20879	3804	3315	24.2368	251	17325	76	20955
1957	5383	22296	22014	4064	3600	24.1433	278	18232	92	22106
1958	5731	23277	22897	4177	3724	24.6209	384	19100	153	23050

1959	6203	24542	24346	4397	3980	25.2750	198	20145	2	24348
1960	6966	26140	26338	4977	4368	26.6488	-205	21163	-365	25973
1961	7012	27592	27499	5283	4889	25.4132	86	22309	-93	27406
1962	7291	28955	28761	5302	5049	25.1805	196	23653	-54	28707
1963	7376	30692	30528	5671	5295	24.0323	170	25021	-119	30409
1964	8073	33494	33806	6778	6279	24.1028	-327	26716	-585	33221
1965	8600	36173	36211	7390	6804	23.7746	-33	28783	-329	35882
1966	8750	38418	38252	7808	7261	22.7758	161	30610	-67	38185
1967	9320	40506	40720	7975	7945	23.0089	-247	32531	-444	40276
1968	10135	43785	44015	8830	8728	23.1472	-231	34955	-367	43648
1969	11033	47304	46839	10296	9066	23.3236	490	37008	178	47017
1970	11613	52025	51258	11385	10067	22.3220	819	40640	437	51695
1971	13454	57926	56832	12211	11286	23.2262	1123	45715	822	57654
1972	15358	64740	64616	12851	12389	23.7226	142	51889	-14	64602
1973	18135	74926	76173	15379	15285	24.2039	-1100	59547	-1666	74507
1974	18365	84844	88424	14879	18201	21.6456	-3333	69965	-3949	84475
1975	21951	106322	108254	17789	21935	20.6458	-1695	88533	-1537	106717
1976	27729	125991	127395	22806	25640	22.0087	-972	103185	-1058	126337
1977	37028	144777	145635	28289	28351	25.5759	-286	116488	1433	147068
1978	42781	167431	166772	33871	32387	25.5514	821	133560	2681	169453
1979	48863	196181	198004	38656	38548	24.9071	-1002	157525	1247	199251
1980	55265	228055	227441	41001	43612	24.2332	1740	187054	5743	233184
198	61229	250912	24842	41864	43746	24.4026	4846	209048	8014	256440

1			6							
1982	71679	274261	275110	45508	47935	26.1353	2233	228753	6140	281250
1983	83470	301840	303637	51547	52099	27.6537	1258	250293	3788	307425
	A)ABNF	B)ABMX	C)EXP	D)SAV	E)NPQX	F)π/GNI%	G)HBOG	H)ABKW	I)KTMY	J)YBHA
1984	88697	324597	329334	56407	59278	27.3253	-1294	268190	692	330026
1985	101250	352563	356675	61503	65181	28.7183	-570	291060	5083	361758
1986	104311	381383	390584	61039	69581	27.3507	-3614	320344	-1435	389149
1987	118804	424694	432148	73988	80344	27.9740	-7001	350706	-2535	429613
1988	134014	475754	494453	83632	97956	28.1688	-18842	392122	-14047	480406
1989	146077	521130	545299	91985	113478	28.0308	-24230	429145	-17181	528118
1990	153921	563740	583902	94937	117027	27.3035	-19825	468803	-9828	574074
1991	155990	593561	604519	91856	107838	26.2804	-8445	501705	-1117	603402
1992	162167	621678	631110	92561	103913	26.0854	-10407	529117	-3344	627766
1993	181788	652935	661810	95422	103997	27.8417	-9421	557513	-980	660830
1994	202186	697858	699063	114239	111623	28.9724	-3328	583619	1506	700569
1995	217086	734953	737674	123084	121364	29.5374	-5156	611869	4172	741846
1996	237772	782131	784859	129281	130346	30.4005	-4413	652850	3527	788386
1997	253861	831780	829756	145440	138765	30.5202	-788	686340	5879	835635
1998	255210	889593	888156	163206	156472	28.6884	-3327	726387	-5438	882718
1999	258979	922360	942955	147549	161857	28.0779	-24818	774811	-13486	929469
2000	258320	971234	993246	150441	167076	26.5971	-28024	820793	-17952	975294
2001	264124	1022352	1043017	157765	171749	25.8349	-23843	864587	-23179	1019838
2002	280293	1081795	1097705	167859	180616	25.9100	-22411	913936	-29106	1068599

2003	306749	1150765	1162373	179370	186913	26.6561	-19439	971395	-25777	1136596
2004	331802	1216857	1232873	189480	200432	27.2671	-25652	1027377	-32992	1199881
2005	355262	1283217	1298148	199007	209689	27.6853	-25928	1084210	-35438	1262710
2006	379291	1339645	1368141	204193	227045	28.3128	-39098	1135452	-34984	1333157
2007	406961	1429346	1449739	238124	250025	28.4718	-32159	1191222	-37620	1412119
2008	416343	1471480	1473985	244091	242042	28.2942	-14413	1227389	-33054	1440931
2009	388788	1419028	1422465	194872	208688	27.3982	-17737	1224156	-20602	1401863
2010	405536	1479043	1498071	202465	218631	27.4188	-37284	1276578	-31502	1466569
2011	422514	1531327	1540116	218076	215467	27.5914	-29046	1313251	-23963	1516153

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[i] Current transfer payments equal total current transfer payments adjusted for subsidies (receipts) less taxes (payments) on products from/to the rest of the world plus other subsidies on production from/to the rest of the world.

[ii] Office for National Statistics GDP quarterly chained volume measures, seasonally adjusted (ABMI).

[iii] A Marr, 'A History of Modern Britain', pp. 298 (Pan Macmillan, 2007)