SEEL-Systems Engineering Economics Lab

George Boole Foundation

SEEL-Telesis Applied Research & Development Programme[1]

Telesis: "An ancient Greek work signifying the steady progress towards an objective through careful planning and the intelligent use of resources."

Theories of Money

A Working Paper

Accompanying the book:

The Bank of England:1975-2025 – The Economic Consequences for the People

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The George Boole Foundation

[1] The SEEL-Telesis AR&D Programme was established in 1983 to concentrate on the development of Decision Analysis and to track and monitor developments in global network applications to identify and design policy administrative management systems in support of Real Incomes Objective Price Performance Policy (RIO3P) distinct counter-inflationary macroeconomic paradigm for the economic development of the British economy.

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Updated: 29th January, 2026: Detail: identity (vi) page 16, changed sign between M and asset, overseas balance and savings objects from addition (+) to subtraction (-). Added the sub-headed section on the associated PPR: "The PPR as a floating, compound, associated global variable".

Executive Summary

This working paper critiques the persistent reliance on the Quantity Theory of Money (QTM) and its Cambridge Equation (CE) variant as inadequate explanations for post-1973 economic realities, particularly the shift from demand-pull to cost-push inflation driven by exogenous shocks (e.g., OPEC price sanctions), quantitative easing (QE)-induced asset inflation, anticipatory pricing, and the massive growth of asset portfolios (now exceeding £20 trillion, nearly 7 times UK GDP).

QTM's assertion that inflation is always a monetary phenomenon (M.V = P.Y) fails to account for productivity pass-through, asset drains on transactional money, savings, and overseas flows.

The Cambridge Equation ((M - s).V = P.Y) improves by subtracting savings but still omits assets as stores and generators of cost-push effects via rents, inputs, and appreciation.

The paper introduces the Value Theory of Money (VTM) as a more comprehensive framework that anchors money's value in real productive capacity rather than money supply quantity. VTM extends the Cambridge Equation by incorporating asset portfolios (A), overseas flows (o), and savings (s) as reductions in circulating transactional money:

$(M – A – o – s).V = P.Y$

Here, assets (land, real estate, commodities, precious metals, art, shares, financial instruments, cryptocurrencies) act as value stores and drains that reduce effective M, drive cost-push inflation through feedback loops, and exacerbate disparity when productivity gains are not passed through to lower unit prices.

The dynamic form further captures changes over time in these components. Central to VTM is the Price Performance Ratio (PPR), defined as:

$PPR = \Delta UP / \Delta AUC$

(where ΔUP is the percentage change in unit output price and ΔAUC is the percentage change in aggregate unit input costs).

PPR measures the extent to which productivity gains are passed through to consumers:

• PPR < 1.00: Prices rise less than (or fall relative to) costs → real incomes rise via benign deflation and enhanced purchasing power.

• PPR = 1.00: Inflation neutral → real incomes decline.

• PPR > 1.00: Prices exceed cost increases → accelerated real income erosion and inflationary pressure.

PPR replaces conventional productivity metrics (e.g., output per hour) because it incorporates inflation effects, anticipatory pricing, and real income impacts under VTM, resolving the "knowledge and calculation" problem through decentralized unit-level responses rather than centralized planning.

Under VTM, money value rises through productivity-driven price stability, enabling debt-free growth and reduced disparity without wage-push or austerity measures.

The Real Incomes Objective Price Performance Policy (RIO3P) operationalizes this by incentivizing PPR < 1.00 via a sliding Price Performance Levy (PPL) that delivers rebates for compliance and surcharges for non-compliance. RIO3P creates a counter-inflationary supply-side environment that aligns

company objectives with national real income growth, stabilizes prices, and counters the failures of Keynesianism and monetarism.

In summary, the Value Theory of Money provides a productivity-anchored alternative to QTM/CE, explaining modern inflation dynamics and offering a coherent path to sustainable real income expansion through RIO3P — a paradigm shift from quantity control to value creation.

Introduction

Because this specific development work on monetary theory, presented in this paper, was not concluded in time, it was not included as a chapter in the book "*The Bank of England: 1975-2025 – The Economic Consequences for the People*" published in 2024.

It was connected to the book via an Internet link as a working paper and the work was completed with regular updates during 2025 under the auspices of the SEEL-Telesis Applied R&D Programme at SEEL-Systems Engineering Economics Lab. SEEL-Telesis ARD Programme is the world centre for the development and dissemination of information on the Real Incomes Approach to Economics.

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The main policy proposal described in the book referred to is Real Incomes Objective Price Performance Policy (RIO3P). This was first proposed by Hector W. McNeill in 1976 after a year of development work to find an effective policy solution to stagflation.

RIO3P is a counter-inflationary supply side solution which promotes economic growth. RIO3P was developed at the same time but is quite distinct from another supply side "solution" developed by Robert Mundell and associated with Arthur Laffer's "Laffer Curve", and lately, Modern monetary theory, because it does not rely on the money volume-related aggregate demand tenets of Keynesianism or monetarism.

RIO3P is a distinct non-monetary paradigm. This, for many economists is counter-intuitive.

Although McNeill completed this proposal almost 50 years ago and reviewed the policy with the main British political parties in 1981, the dominant focus on Keynesianism and monetarism by economic advisers and politicians at that time meant that little progress was made in the consideration, let alone the deployment or acceptance of RIO3P.

However, the declining state of the British economy since 1975 following the initial shock of the 1973 OPEC petroleum price sanctions, demonstrated the incapacity of Keynesianism and monetarism to prevent a wholesale deindustrialization of the country, a declining balance of payments for goods, rising income disparity and poverty affecting the wellbeing of an increasing proportion of the constituents of the United Kingdom.

The post 1981 experimentation with Mundell-Laffer supply side economics in the United Kingdom, proved to be unsuccessful with the result of 600,000 home repossessions.

Whereas the book describes the RIO3P policy and how is can be administered, the development of a working theoretical model of how the economy operates under RIO3P is a useful venture.

This is why this document has been produced to share the current state of development of an enhanced money theory, the Value Theory of Money designed to replace Irving Fisher's 1911 Quantity

Theory of Money and Arthur Pigou's, Alfred Marshall's and John Maynard Keynes' Cambridge Equation developed over the period 1917-1923.

Why is this work of importance?

The Value Theory of Money exposes the role of assets in representing, along with savings, a major store of accumulating value which already exceeds around £20 trillion or almost 7 times the GDP of Britain and held by a small number of institutions and constituents. These portfolios of assets as well and interest bearing savings benefit from interest rates, induced asset price rises that accompany monetary policy decision cycles (MPDCs) and from rentier income. Over MPDCs asset prices have increased at a faster rate than the average GDP growth of the country because of over 50 years of falling investment associated with inadequate rises in productivity in the goods and services sectors.

There is, therefore, a structural issue in the British economy which is exacerbating the state of income disparity and at the lower reaches of incomes, creating poverty.

This reality is creating an emerging political problem of a major rising wealth and income disparity which is transferring resources and money away from the real supply side economy where the majority of the population is employed.

The combination of the logic of the Value Theory of Money and of the Real Incomes Objective Price Performance Policy provide a basis for correcting this pernicious structural defect in the British economy to bring the economic management of the country in line with a more constitutional approach to economics.

Building a functional model to create a detailed workbench upon which to analyse such relationships as a basis for the design of improved macroeconomic policies is an essential step in establishing a way forwards for Britain to recover from a process of economic decadence and decline.

Theories of Money

This document sets out descriptions of three steps in an ongoing evolution in the theory of money with the starting point being the Quantity Theory of Money (QTM) elaborated by Irving Fisher of Harvard University, in 1911.

The QTM considered the prices of goods and services to be a direct function of money volume in the economy.

From this simple, and what is now realized to have been a special case identity, this paper describes the combined contributions of Alfred Marshall, John Maynard Keynes and Arthur Pigou, all of Cambridge University, to the elaboration of an alternative version of the QTM in the form of the Cambridge Equation. (CE)

The CE introduced a modification to the QTM by adding the variable for savings to be deducted from the money used in transactions

Savings reduce the quantity of money in circulation and therefore modify the quantitative relationship between money volume and the price of goods and services.

Hector McNeill observed that in 1975 the post-1973 OPEC petroleum price sanctions had three worldwide impacts of:

1. Introducing imported (exogenous) rises in input prices (costs) which had a larger impact on inflation than national money volume;
2. Creating a parallel impact of rising unemployment and rising inflation in the form of stagflation.
3. Business reactions to cost-push inflation led to "anticipatory pricing" which generalised (endogenous) cost-push inflation across the economy

In 2010 McNeill observed two additional effects resulting from Quantitative Easing resulted in:

4. An initial significant rise in asset prices which subsequently created an internal (endogenous) cost-push effect as some key assets became inputs to goods and service production companies.
5. A corporate response in generalising this cost-push inflation through anticipatory pricing

Anticipatory pricing

While observed in 1975, anticipatory pricing was first reported by McNeill in 1976 as a reaction of companies to cost-push inflation where their response is to raise their prices to:

1. Maintain their profits;
2. Guarantee future activity
3. Guarantee future employment
4. Build up cash flow to be able to purchase the next period's inputs which are experiencing rising prices.

Anticipatory pricing has been rediscovered more recently by some economists in the form of "sellers' inflation" or even "greedflation".

The generalization of cost-push inflation

In the book, "*The Bank of England: 1975-2025 – The Economic Consequences for the People*" McNeill shows how these five cases of cost-push inflation nullified the logic of the QTM and the CE as well as the often-quoted statement by Milton Friedman,

"*Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output*."[2]

McNeill traced the global impact of the post-1973 petrodollar, financialization and globalization and, in particular, the case of the United Kingdom in spreading the dominance of exogenous (imported) cost-push inflation feeding an endogenous (domestic) growing services sector, with low productivity potential, as a result of the offshoring of industry. Such service companies having low productivity enhancement capabilities and, by default, resort to anticipatory pricing which is inflationary.

Accordingly, the UK underwent a significant change in its structure transitioning from an industrial export economy to an (IDIS) Import Dependent Inflationary Services economy with low productivity potential.

[2] Friedman, M., "*The Counter-Revolution in Monetary Theory", 1970.*

The evolution of theories of money is presented in the next section.

The Quantity Theory of Money

The Quantity Theory of Money (QTM) attempts to shown the relationship between money volumes in the economy and average prices of goods & services.


Fisher

The commonly used QTM, proposed by Irving Fisher[3] in 1911, is as follows:

$$M.V = P.Y \ldots (i)$$

Where:

M is the volume of money used in goods and service transactions;

V is the velocity of money circulation;

P is the average price of goods & services;

Y is the quantity of goods & services transacted (purchased) or, real income.

As a broad interpretation this infers that a rise in the volume of money (M) results in a rise in the average prices of goods and services.

A qualification to this interpretation is contained in an oft-quoted statement by Milton Friedman,

"*Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output*."[4]

This implies that if M rises at the same rate as Y then prices would remain stable. Looking at the QTM, this make sense. So doubling M and doubling Y would leave P at a fixed level.

The Cambridge Equation

In the period 1917 through the early 1920s, John Maynard Keynes, Arthur Pigou and Alfred Marshall realized money is not simply a medium of exchange but possesses other properties such as enabling the individuals to exercise a "time preference" over the use of money to purchase goods and services by placing money into "savings".

This approach was referred to as the "cash balance approach". The Cambridge equation first appeared in print in 1917 in Pigou's "*Value of Money*"[5]. Keynes contributed added to this theory with his 1923 "*A Tract on Monetary Reform*"[6].
This "*cash-balance*" approach also showed that savings would reduce the amount of money in circulation.

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[3] Fisher, I., & Brown H.G., "*The Purchasing Power of Money - Its determination and relation to credit interest and crises*", Augustus M. Kelley, Publishers, 1911.

[4] Friedman, M., "*The Counter-Revolution in Monetary Theory", 1970*.

[5] Pigou, A. C., "*The Value of Money*" The Quarterly Journal of Economics, Volume 32, Issue 1, November 1917, Pages 38–65.

[6] Keynes, J. M., "*A Tract on Monetary Reform*", Macmillan & Co., 1923.

To account for this reality, they therefore produced what is known as the Cambridge Equation (CE).


Keynes

There are several versions of the CE but to register the basic effect a simple version of this is shown below[7]:

$$(M - s).V = P.Y... (ii)$$

Where: s is savings.


Pigou

As can be seen, increasing the money volume would only increase P if the increase was not directed into savings. Or if the quantity of goods and services fell.

The Cambridge version of the QTM was a foundation for Keynes's criticism of the Quantity Theory and a revival of this theory.


Marshall

In his "*General Theory of Employment, Interest and Money*"[8], Keynes extended this to establish the Keynesian concept of liquidity preference.

One of the interesting observations is that while some emphasis was given to savings linked to the notion of liquidity preference, less attention was paid to the role of savings in investment and productivity.

The Value Theory of Money


McNeill

McNeill considered that neither the QTM or the CE as theories match reality for two reasons:

1. There is no allowance for productivity which is an essential component of production or output and determinant of feasible price setting.

2. There were no known advances in theory or practice to acknowledge or accommodate the changing circumstance created by the OPEC 1973 petroleum price sanctions.

The transition from demand-pull to cost-push

Between 1973 and 1983 the price of petroleum rose seven-fold.

This created a state of affairs where neither the QTM or CE had any relevance to the actual circumstances because inflation was overtly cost-push and bore little relationship to the volume of money in the economy.

Similarly, a paradox appeared during the period of quantitative easing (QE) starting in 2008 and continuing up until 2020, and beyond. QE involved massive influxes of money into the economy associated with close-to-zero interest rates. McNeill observed that both Irving's QTM and the Cambridge Equation would have predicted a significant rise in the prices of goods & services. However, at first this did not happen but real incomes, or purchasing power of wage-earners began to fall (Y).

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[7] This format is used so as to facilitate the understanding of the discussion that follows on an extension to this identity.

[8] Keynes, J. M., "*General Theory of Employment, Interest and Money*", Palgrave Macmillan, 1936.

This was because QE money was not flowing into goods and services investment, wages or goods and services purchases but, rather, most of it was flowing into assets in addition to savings.

Neither the QTM or the Cambridge Equation contain any variables representing assets.

A secondary effect which McNeill had observed in 1975 was that anticipatory pricing occurred during QE generalizing cost-push inflation in particular money flowing into land, real estate and commodities created a cost-push effect in goods and services companies as well as impacting constituents and households.

Asset and savings portfolios

In the case of high income and wealthy individuals who trade and possess assets there is usually an association of a savings or interest-bearing account of some kind with asset holdings.

Savings can become the source of additional funds spent on something which acts as another store or a drain.

However, savings are not the only store of value which removes money from transactions and lowers the variable M. There are, in addition, several classes of assets and flows of money overseas. Therefore, a baseline modified Cambridge Equation which includes these variables can provide a more realistic representation of the factors that influence the relationship between the volume of money and the average prices of goods and services.

This has been set out as a new relationship entitled the Value Theory of Money which includes 8 major asset classes, overseas monetary flow balance, savings, goods andservices.

The Value Theory of Money (VTM) can be represented as follows:

$$(M – A -o -s)).V = P.Y \ldots(iii)$$

M is money used in transactions for goods and services:
M= g + v

A is assets or

$$A = l + r + m + p + a + h + f + c \ldots (iv)$$

This expands to

$$(M - (l + r + m + p + a + h + f + c) – o - s)).V = P.Y \ldots (v)$$

Where:
g is goods;
v is services;
l is land;
r is real estate (buildings);
m is commodities;
p is precious metals;
a is rare objects and art;
h is shares;
f is financial instruments;

c is cryptocurrencies;
o is overseas flow balance;
s is savings

Descriptions of these variable can be found in ANNEX 1.

V, P and Y are the same as in the CE and QTM as money velocity, average prices of goods and services and quantity of goods and services or real incomes respectively.

Value sources, stores and drains

Most of the added asset variables represent value holding positions which on balance can be ***stores*** or subsequent ***sources*** of funds when withdrawn or sold as well as rented out. They can also have the value of zero. In general, regularly purchased goods and services become ***drains*** especially in the case of "consumables" and "perishables" such as food.

Transactions involving such stores of value can result in all or some proceeds being transferred to savings or some form of interest-bearing product or account as is often the case in wealth portfolios.

Time-based valuations

Inflation in assets prices constitutes increasing "valuation" of the held assets. There principal objective of asset and savings portfolios is to accumulate value to build-up of increasing wealth.

Each asset class is associated with intermediation services such an estate agents, brokers and traders generating fees and commissions on asset sales. Depending on the asset class, individual broker and commission agent fees can vary for a few hundred pounds to several million pounds per transaction while at the same time these commissions represent a very low percentage of sales values.

Each asset variable in this Value Theory of Money is a tag or identification of the asset involved and which normally acts as a rising store of value. On closing these positions through a sale, a source of money is generated. For example, the purchase of an asset represents the creation of a position as a store of value, usually appreciating in value. On selling the asset or closing that position the monies received, in many cases, are transferred to interest-bearing instruments or forms of saving. Therefore, all of the assets listed to varying degrees represent encapsulated arrangements containing two forms of stores of value as an asset and/or an interest-bearing savings account. This results in a proportional reduction in the volume of money in the consumption goods and services markets (M) as the accumulated value of the asset and savings portfolios rise.

Significance of asset and savings portfolios

Many brokers, company executives and owners maintain wealth portfolios where they allocate the funds, in excess of their normal cost of living outlays, usually to land and building real estate and interest-bearing savings in a bank. The important point to note is that over the last couple of centuries, thousands of brokers, executives and corporate owners have been purchasing assets and leaving funds in interest earning accounts.

No matter what the Bank of England has been doing over the monetary policy decision cycles (MPDC) to "stabilize" the prices of goods and services, there has been an incessant growth in asset prices and interest bearing savings which have risen in value while at the same time pressuring cost-push inflation emanating from the asset price rises and rents and from anticipatory pricing by companies.

Irrespective of monetary policy decisions asset price valuations rise tend to rise at a higher rate than general growth rates within the real economy producing goods and services and paying wages and in the case of land, real estate and commodities exacerbate the cost-push situation through rises in input prices and rents.

As a result, the growth rate of asset portfolio values usually exceeds the growth rate of the economy in real terms creating a significant rise in income disparity between asset holders and traders and wage-earners. This is discussed in greater detail in the associated book.

The net result has been very significant growing concentration of income and wealth in the hands of a very small number of institutions and constituents who are associated with the domain of asset holding and trading.

Productivity - accounting for changes in asset and money values

So far in this discussion, no reference has been made to a central factor in the Real Incomes Approach and Value Theory of Money. This is the significance of productivity in determining output prices, and therefore the purchasing power of value of money. Under inflationary conditions the appropriate measure of productivity is the Price Performance Ratio (PPR).

Productivity is a critical variable in the Value Theory of Money which contributes to the logic of policy propositions such as RIO3P to adjust the goods and services price accessibility by raising real incomes and purchasing power of wage earners.

In the book, "*The Bank of England: 1975-2025 – The Economic Consequences for the People*" McNeill explains the significance of productivity in impacting the prices of goods and services and an annex in the book provides a detailed review of the range of types of productivity.

As explained in the book, productivity changes are a more potent and effective policy instrument to reducing or eliminating inflation that the conventional instruments of interest rates and taxation.

The Price Performance Ratio (PPR)

In 1975 McNeill realizes that the traditional methods of measuring productivity in a highly inflationary economy required a measure that enables physical productivity to be converted into a relevant measure of productivity. Under such circumstances, the measure needed to quantify the extent to which a company influences inflation or money purchasing power or real incomes. Clearly, any such an impact of productivity on output prices and the changes in real incomes needs to compare the changes that occur over specific time periods.

During any selected time period the critical measure to trace what is happening to inflation is the Price Performance Ratio (PPR).[9] The PPR[10] was elaborated by McNeill in1975 and is the percentage change in unit output prices in response to the percentage change in the aggregate unit input costs.

$$PPR=\Delta UP/\Delta AUC$$

[9] McNeill, H. W., "*The Bank of England – The Economic Consequences for the People*", Boolean, 2024

[10] The PPR is a compound variable and the formula presented only refers to inflationary conditions while other formulae are applied to deflationary and stable conditions. In practice algorithms for such calculations are scripted as Boolean decision analysis trees which terminate with the desired formula according to operational policy preferences.

Where:

ΔUP is the percentage change in unit output prices;
ΔAUC is the percentage change in the aggregate unit costs.

The significance of PPR values

Notice that the PPR specifically measures the degree to which productivity impacts cost-push inflation although it can accommodate deflationary and stable cost conditions.

Goods & services

In the case of goods and services or the "cost of living items" or content of M in the Value Theory of Money, the PPR values have three significant breakpoints.

Under inflationary conditions:

1. If the PPR is less than unity (PPR<1.00) productivity has reduced the output unit price below the input rate of inflation. This raises the value of the pound and consumer purchasing power and real incomes.

2. If the PPR is equal to unity (PPR=1.00) productivity has maintained the output rate of inflation in the output price. This maintains to decline in the value of the pound and consumer purchasing power and real incomes continue to decline.

3. If the PPR is greater than unity (PPR>1.0) productivity has resulted in inflation rising above the input rate. This accelerates the decline in the value of the pound and consumer purchasing power and real incomes continue to decline.

PPR value impacts on profits and purchasing power in goods & services production

PPR	Output inflation	Profits	Consumer* purchasing power
> 1.00	Exceeds input inflation rate	Rise	Declines more
= 1.00	Equal to input inflation rate	Stable	Declines
< 1.00	Below input inflation rate	Fall	Rises
*Business to Government (B2G); Business to Business (B2B); Business to Consumer (B2C)			

Assets

Because of the normal delays between asset purchases and sales and in the often very low additional investment or changes introduced to them the nature of PPRs is they all exceed unity (PPR>1.00) which indicates a high and rising inflationary trend.

The common PPR value impact on profits and purchasing power in the asset domain

PPR	Output inflation	Profits	Consumer* purchasing power
> 1.00	Exceeds input inflation rate	Rise	Time-based rise

Why under VTM the PPR replaced conventional productivity measures

The conventional measures of productivity include output per person hour and total factor productivity. At the macroeconomic level the measure applied is Value Added or the GDP divided by hours of labour input. This measure evolved from the US Bureau of Labor Statistics, the ILO and OECD before the significant structural change to the exogenous cost-push and endogenous cost-push anticipatory pricing structure settled in in the UK. As a result, this measure is no more than a

“monetary yield” and has no relationship to productivity because of the multiple variables that make up Value Added or GDP which have no relationship to productivity including price setting, shareholder value and inflation.

However, the Value Theory of Money is interested in money value and therefore also in the impact of change within companies influencing the purchasing power of the currency (pound). The point of interest is, therefore, how companies have transformed levels of input inflation into levels of output inflation.

The PPR measures establish whether or not companies increase, have no effect or reduce inflation and by the same order measure of the change in real incomes of consumers and the workforce.

This is not to deny the importance of physical productivity but its impact cannot be determined using conventional measures of productivity because profits, anticipatory pricing and inflation can alter these measures in an arbitrary manner.

Money Value

Money value is distinct from money volume or quantity and can be expressed as the differential gains in the purchasing power arising from output price reductions attained through a range of attained Price Performance Ratio (PPR) values that impact disposable real incomes assuming a UK Gross Domestic Product of £3.125 trillion

Money value implications of VTM

The significance of VTM is to identify possible beneficial pathways to improving the stability and growth in real incomes or purchasing power of disposable incomes by maintaining or raising the value of the pound.

It is apparent that one definite way to achieve this is to base policy on an incentive scheme to encourage economic units to operate with a PPR of less than unity (PPR<1.00).

If we compare this with the contrasting theory of the Quantity Theory of Money, the assumption is that the money volume M needs to be reduced and in compliance with the Keynesian notion of aggregate demand or QTM notion of money volume such a reduction in M is attempted by raising interest rates or taxation.

Raising interest rates results in higher financial charges which in a cost-push inflationary situation only increases the decline in real incomes caused by inflation. As a result, there is a fall in demand creating a market depression impacting both economic units and constituents, creating austerity.

Raising taxes to lower inflation has a very similar effect in that this lowers the purchasing power of disposable incomes. As a result, there is a fall in demand creating a market depression impacting both economic units and constituents, creating austerity.

In contrast, by securing operational states of PPR<1.00 inflation falls and demand rises while avoiding austerity.

PPR values and growth rate differentials and absolute gains in real income
Assuming a UK GDP of £3.125 trillion

PPR	PP gain	Growth rate	Absolute gain £ billion
0.99	1%	1%	31
0.98	2%	2%	62
0.97	3%	3%	93
0.96	4%	4%	124
0.95	5%	5%	155
0.94	6%	6%	186
0.93	7%	7%	217
0.92	8%	8%	248
0.91	9%	9%	279
0.90	10%	10%	310

Money value implications of QTM

The assumption of Keynesians and Monetarists is that raising money volumes or aggregate demand through bank credit/loans or government borrowing that this leads to raised demand and therefore growth in the economy.

The significant point is that raising money volumes may well raise demand but the problem becomes the differentials introduced into income distribution since this depends upon who receives the increase money. In addition, any such growth is not linked to increases in productivity or price reductions so there is no generalised rise in purchasing power or real incomes. There is however, a generalised loss in real incomes on the part of all constituents.

Indeed, under the current circumstances the prevalence of a cost-push exogenous and endogenous structure and anticipatory pricing would see PPR values exceeding 1.00 and therefore growth in money supplies would be accompanied by inflation.

This signifies that this "Size of the Pie" logic supports a rise in nominal economy wide cash flow but this "growth" is not, by default accompanied by rises in productivity and as a result records a fall in real incomes and real growth.

PPR values and growth rate differentials and absolute gains in real income
Assuming a UK GDP of £3.125 trillion

PPR	PP gain	Growth rate	Absolute loss £ billion
1.05	- 5%	- 5%	- 155
1.04	- 4%	- 4%	- 124
1.03	- 3%	- 3%	- 93
1.02	- 2%	- 2%	- 62
1.01	- 1%	- 1%	- 31
1.00	0%	0%	0

Indeed, between 1945 and 2025 the average rate of inflation under the Bank of England management as both governmental and independent status following the logic of the QTM, was 5% representing a loss in purchasing power equivalent to 40% each decade over 8 decades.

The role of RIO3P

The role of RIO3P is to provide economic incentives for companies to benefit from the maintenance of PPRs below unity, thereby generating real growth based on rising purchasing power to avoid the hidden depression under nominal QTM aggregate demand operations..

Value Theory of Money dynamics

Therefore, the Value Theory of Money (VTM) can be modified to create a dynamic Value Theory of Money formula as follows.

((M'+M) - ((l'+ l) + (r'+ r) + (p'+ p) + (m'+ m) + (a'+ a) + (h' + h) +(f '+ f) + (c'+ c) + (o'+ o) + (s'+ s))).(V' + V) = ((P' + P)).(Y' + Y)) .... (vi)

Where the M variables include goods (g) and services (s) or cost of living factors.

Where the prime " ' " indicates the change in value of the money store at the end of the period and the non-prime variables are the values of the money store in each case at the beginning of the period. The changes can be positive, negative or zero.

The PPR as a floating, compound, associated global variable

For the same period of the registration of these changes will be a specific PPR as a floating, compound and global variable recording the changes in prices of goods and services (ΔUP) in response to the change in aggregate unit costs (ΔAUC)

The significance of income-price and elasticity of demand

Therefore, as a result of changes in corporate productivity and flows of money to stores of value in each asset class, overseas flow balance and savings will undergo changes in relative values according to the change in value of M or M'+M and decisions by those transacting in assets this will be accompanied by a change in average prices according to the cross sector PPR value.

According to the movement in relative prices, the income-price elasticity of consumption or demand (ipEd) will determine the change in Y or real incomes.

The "income-price" link is simply to register the fact that the actual price elasticity observed varies with the disposable income level. This determines budgets and the propensity to react to the prices of specific items declining.

PPR and ipEd dynamics

The interaction of the PPR changes, especially those with the less than unity range (PPR < 1.00), with the ipEd determines the positive growth rates and market penetration volumes of lower priced goods

and services disseminating rising real incomes as well as the amounts of any additional funds flowing into savings or other stores of value such as assets.

Indeed, the workforce can experience a rise in their real purchasing power or consumption at the same time as producing more lower priced output as a result of increased productivity increasing the purchasing power of the pound and their real incomes.

Th rise in growth and purchasing power becomes a generalised condition for constituents even without wage bargaining.

Associating periodic PPR estimates with the asset portfolio changes in the VTM

It is likely that different sectors deploying different technologies will end up with different feasible PPRs but the measurement is straightforward and can either be based on surveys or data can be collected directly from companies by using the Operations Management System (OMS) proposed for the management and support of RIO3P.

A simple summation of PPRs to create a weighted average would be sufficient to assess the degree to which productivity and anticipatory pricing under the 3P regime is reducing inflation, raising the purchasing power of the pound and real incomes of consumers and workforces alike.

Resolving the "knowledge and calculation" problem through unit response and policy coherence

Friedrich Hayek and Ludwig von Mises pointed to the difficulty of centralised policy making to dimension the size of policy instrument values such as prices, interest rates and taxation to a highly heterogeneous population of economic units and constituents across the economy. The result, they correctly predicted would be arbitrary impacts on just about all agents.

The role of the PPR in the VTM environment is to enable economic units to respond to conditions by setting their own prices to maximise profits while ensuring that their allocations comply with policy objective of maintaining or raising real incomes. In this way the policy managers do not have to set policy instrument dimensions such as interest rates or taxation but allow firms to set their own prices to optimise their allocations while observing the PPR<1.00 constraint.

The policy solution to achieving this is through RIO3P's use of a sliding levy (Price Performance Levy – PPL) which provides rebates or imposes surcharges across the PPR<1.00to PPR>1.00 range.

The growth in money supplies

So far no reference has been made to the "management" of money supplies or M for goods, services and asset transactions.

Most discussion on this subject defaults to the quantity of money as opposed to the value of money and tends to end up in loan theory involving the operation of banks.

The underlying presumption is that economic growth requires that companies need to raise loans or credit and get into debt to achieve growth.

In this context there are three main approaches known as “fractional reserve lending”, “loanable funds lending” and the “money creation approach”.

VTM & QTM Growth

There is a distinct difference between the VTM and the QTM in what constitutes growth.

The QTM approach and Keynesianism assume that a rise in the volume of money creates a rise in demand which generates growth. Therefore, growth is related to money volume. This is often associated with a “size of the pie” theory of growth. Because this is not associated with any reference to unit prices or productivity it conveys nothing with respect to purchasing power and real incomes, in short, real growth. Indeed, the conventional use of interest rates and taxation as counter-inflationary instruments create austerity because of their direct augmentation of financial charges (costs) or direct reduction in disposable incomes (demand).

Under the VTM growth signifies specifically rises in real disposable income purchasing power arising from falling goods and service prices generated by rises in productivity to lower unit costs and output prices. The ipEd levers price reductions into rises in consumption volumes and disseminates lower-prices goods and services thereby spreading the rise in purchasing power and real incomes. Therefore, growth is counter-austerity in nature but pro-demand by creating real growth.

Loan theory under QTM

The association of money volumes with demand and growth under the QTM regime causes it to be worth reviewing the QTM-related loan theories which explain how money volumes are increased by the banking system. There are three basic theories of lending or issuance of credit or debt, known as:

- Fractional reserve
- Loanable funds
- Money creation

Fractional Reserve

Fractional reserve lending involves bank lending out a proportion of funds held while maintaining a reserve to handle unexpected calls on deposits. The fact that a proportion of lent out and the process can be repeated by banks, this effect is considered to possess a “multiplier effect”.

Loanable Funds

Loanable funds lending is simply banks collecting funds from savers paying a specific interest rate and lending out the same funds at a higher rate to borrowers. In the UK today some 30% of mortgages are loanable funds provided through mutual Building Societies, the rest are provided by banks using money creation.

Money Creation

Money creation is simply a bank crediting a borrower’s account with the value of a purchased asset such as a house which acts as the guarantee of repayment in the event of the borrower not being able to repay the “loan”.

It is important to clarify a point of confusion that arose from a paper published in the Bank of England Quarterly Bulletin Q1 2014 article, "*Money creation in the modern economy*"[11].

This article explains that in order to credit a customer account with a loan the bank credits the customer account with an entry to the amount of the loan using a keyboard.

Because the subsequent operations which turn this entry into an operational loan, whereby the customer can use those funds, was missing from this paper, the impression was given to some that banks conjure up loans from "thin air".

Money creation from a frozen asset

Although the phrase "money creation" sound somewhat exotic the reality is that any funds advanced are creating a liquid or cash resource by removing the agency value of an asset (the guarantee collateral) and advancing a value liquidity roughly equal in value to the frozen asset. The funds therefore stand in to represent the value of a legacy asset which was previously in liquid format but which, as a result of legal charges operationalized under the loan cannot be used by the borrower for other purposes.

Collateral liquidity equivalence

In reality, all bank loans are advances of "collateral liquidity (money) equivalence" or the advance of funds against the guarantee of immediate repayment in the event of the borrower being unable to repay the loan.

This, in reality signifies that banks exercise an intermediation function between the collateral guarantee provided as collateral by the borrower and the bank's risk criteria.

Banks as intermediaries

Intermediation is simply the process whereby an agreement is reached on the conditions of a loan as well as bringing about the arrangements to make any loan functional in the sense that the borrower can actually gain access to and make use of the funds provided through the act of "lending".

Formally, intermediation is defined as completing a connection between two objects, in this case a bank and a potential borrower to arrive at an agreement on the maintenance of defined existing states and obligations as the conditions of a loan contract.

Under VTM the approach to loans is traditional

The first step in this intermediation in the case of all loan theories is for the bank representative (manager) to determine:

1. the size of loan required
2. the current income of the potential borrower
3. the type and value of the collateral the borrower can provide to guarantee the loan.

Based on this information the bank representative can propose the:

4. interest rate that they would charge

[11] McLeay, M, Radia, A., & Thomas, R., "*Money creation in the modern economy*" Bank of England Quarterly Bulletin Q1 2014

5. the appropriate period of the loan.

Arriving at an agreement on this basis can result in the loan being registered on the basis of all of the above factors having been agreed upon.

From the standpoint of VTM all such loan theories are of little relevance to the question of money value established as a result of productivity and unit price reduction. In all cases no loans would be advanced without the existence of a guarantee of some kind as collateral.

Thus, in the case of a mortgagee the house being mortgaged is the guarantee of repayment of the bank and in the cases of, for example, investment, usually some form of asset of value exceeding the size of the loan is required before the loan would be made.

Credit, Debt and economic instability

Most of the economic instability faced by the economy has been the result of excessive private and government debt and in particular where assets and loan collateral markets have declined meaning banks no longer have “cover” of their loan exposure..

The VTM providing the logic for a growth model based on PPR<1.00 means economic units and the country can secure economic growth and rises in real incomes without incurring excessive debt and in many cases having no debt.

The size of asset portfolios

The principal assets in these portfolios are land and property and these alone in 2024 in the UK, constitute an estimated value of around £11 trillion. This is based on a SDAG projection of 2022 ONS data. That is almost five times the current national GDP of around £2.3 trillion.

Of this £11 trillion about 50% of that is land (£5.5 trillion) and roughly 20% of that is dwellings

(£2.2 trillion) and 16% of that is other buildings and structures (£1.75 trillion).

There is about 15% held in other forms of wealth. This does not include the associated savings within the portfolios concerned. The associated national 2024) debt is £2.7 trillion which exceeds the GDP.

Land and structures valuations are an evolving field. Of late, the Office of National Statistics produced estimates both in 2017 and 2022 by applying what is known as the residuals approach. Since land is not a manufactured product the science of valuation is limited to essentially average market valuations. There are two other bases for valuation, the investment value and feasibility value but these are not applied. In reality they would render land values to be lower.

The Value Theory of Money in context

Price Performance Policy operates on the basis of encouraging management to make use of specific business rules to invest in unit costs reducing productivity so as to project forwards estimated feasible drops in unit costs. On that basis it is possible to calculate a target adjusted price and therefore the Price Performance Ratio (PPR). The expected percentage decline in unit price associated with the estimated fall in unit costs is then used to calculate the expected rise in numbers of units sold based on the income-Price elasticity of Demand (ipEd). Depending upon the difference in inflation of aggregate unit costs and the projected price rises or falls, the corporate tax is calculated (referred to

as Price Performance Levy) providing increasing rebate levels according to the degree the inflation rate is lowered or inverted.

Therefore, a Value Theory of Money identity would serve to stabilize prices and secure a rise in real incomes when the economy is managed under a RIO3P environment. However, without the RIO3P incentives PPRs are likely to be typical of that of a state of affairs of anticipatory pricing and a difficult-to-control state of inflation.

An important message

The Quantity Theory of Money and the Cambridge Equation provide very little guidance on where the prices of goods and services will end up in the absence of information on the policy instruments to be used to "control" inflation. This is also the case with the Value Theory of Money. However, the movement of prices of goods and services become predictable when the PPR managed within a policy environment based on RIO3P.

The important message is that all money theory identities convey little without knowledge of the specific policy environment and policy instruments applied under which they operate.

ANNEX 1 The added variables of assets, overseas flows and savings

Going through the new variables added to the Cambridge Equation to create the Value Theory of Money the following section provides a more detailed description of each one.

Looking at the first three variables of land (l), real estate (r) and commodities (m).

Land (l)

Land is agricultural land and land used for infrastructural and building site land projects. Land is normally considered to be appreciating store of value.

Real estate (r)

Real estate is commercial retail units and offices, industrial units, storage and warehouse units as well as housing. Real estate, like land is normally considered to be appreciating store of value.

Transactions in land and properties generate a constant flow of sales commissions and conveyancing fees supporting a constant growth in prices as well as wealth portfolios containing land and properties and interest-bearing funds in a "savings" category.

Commodities (m)

Commodities are those commodity positions that take up temporary roles as assets or stores of value as futures contracts and arbitrage including food, fibre and feedstocks, hydrocarbons as natural gas and petroleum and petroleum products in the form of fuel oil, diesel, gasoline, aviation fuel and lubricants and an additional 6,000 petrochemical derivatives including products entering all sectors such as plastics and fertilizer. Commodities include minerals, ores, rare earths, aggregate and sands.

Commodities include industrial metals such as tin, silver and copper.

So when, for example, under quantitative easing combining a large injection of funds into the economy at very low interest rates induces a flooding of these markets which induces price rises which becomes a spiral in that, the simple act of purchasing and a slight delay on reselling, results in a profit.

Transactions in commodities generate a constant flow of sales commissions and fees which can be extremely high in the petroleum and gas domain supporting growing wealth portfolios containing fixed assets such as land and properties and interest bearing funds in a "savings" category.

However, as the assets of land, property and commodities become inputs to the production or servicing of goods and services this creates what was a demand-pull-like impact on assets to become a cost-push impact on goods and services production.

The response of most companies to rising costs is to operate in an anticipatory pricing mode to increase prices to secure their profits. This is a logical act to guarantee future activity, employment and build up cash flow to be able to afford the input requirements for the next operational period, that are facing rising prices. Anticipatory pricing has a sound financial justification but it has the effect of disseminating cost-push inflationary pressure throughout the economy.

Because most land and building pricing and rentals are subject to rising valuations and are adjusted through contracts, these asset price impacts are delayed until contracts are renewed so there is a delay in this rise in cost-push inflation by around 18 months to two years on average.

Monetary policy, because of an application of the flawed basic theory of the QTM as policy and as a basis for policy decision making, is the main contributing cause of this phenomenon.

The goods & services feedback loops from land, real estate and commodities

The inducted prices in land, real estate and commodities naturally have a feedback loop into the prices of goods and services as a result on rising prices or rentals and as process inputs. These impacts tend to be delayed by around 18-24 months as a result of contract renewal or adjustment clauses in land, real estate rentals and commodity supplies.

Precious metals (p)

So, in the precious metal categories (variable p) there are some industrial metals that include copper and tin as well as silver also can act as assets which along with gold, platinum and palladium that are considered to be assets as good stores of appreciating value to hold when economic circumstances become precarious.

Rare objects and art (a)

Rare objects and art (variable a) is a select market normally used by high income investors considered to be appreciating stores of value.

Shares (h)

Shares (variable h) are essentially a financial asset which under quantitative easing attracted funds under buy back schemes leading to rises in the stock market's nominal value. Under normal

circumstances shares reflect the evolving performance and prospects of a company. However, some 50% of the stock market rises under the first phase of quantitative easing were related to share buy backs. These share price rises did not reflect improved prospects, investment or good p/e ratios but generated a form of a misleading investment image.

During the quantitative easing period banks sometimes lent companies money at low interest rates to buy back their shares and paid back from the significant rises in share value.

Financial instruments (f)

Financial instruments (variable f) include derivatives and other financial products largely located in the grey market which has a massive value reaching the dimension of national economies. Naturally most people earning their incomes from wages are not involved in this domain. It is dominated by banks and hedge funds. Therefore, although circulating money is not the source of derivatives purchases the results of closing derivative positions, or trades, can result in addition flows entering the money volume via individual bonuses and receipts, ending up in wealth portfolios. This is a convenient location to place trading covering all bank transactions and positions where traders can earn very high bonuses leading to the same sort of growth in asset holdings.

Cryptocurrencies (c)

Cryptocurrencies are digital or virtual currencies that use cryptography for security and operate on decentralized networks based on blockchain technology (similar to SEEL-Telesis Accumulogs). Unlike traditional money, they are not issued or controlled by any central authority (such as a government or bank). Instead, transactions are verified and recorded by a distributed network of computers (nodes).The first and most well-known cryptocurrency is Bitcoin, created in 2009. The current value of existing Bitcoins is around £1.34 trillion.

Thousands of others (often called altcoins) now exist, such as Ethereum, Ripple (XRP), Cardano, and Solana. Cryptocurrencies enable peer-to-peer transfers without intermediaries, offer global accessibility, and provide varying degrees of privacy and transparency depending on the specific coin. They can be used for payments, investments, decentralized finance (DeFi), smart contracts, and more. Their value is determined by market supply and demand with most holding cryptocurrencies as a valuating assets as opposed to a medium of exchange..

Overseas flows (o)

Overseas flows are the interesting case (variable o) because after 1975 this became a virtual black hole where investment funds flowed abroad acting as a drain rather than remain within the country, the associated result was the initiation of a major deindustrialization, declining rates of productivity rises and the circulation of profits outside the country often routed to avoid taxation in the UK.

Savings (s)

Sources of overseas investment funds

A considerable amount of invested funds come from corporate cash flows or equity and then offshore, cash flows generated can be used to reinvest in the offshore activity.

On the other hand, some investment would come from bank loans which brings us to the issue of how banks provide loans.