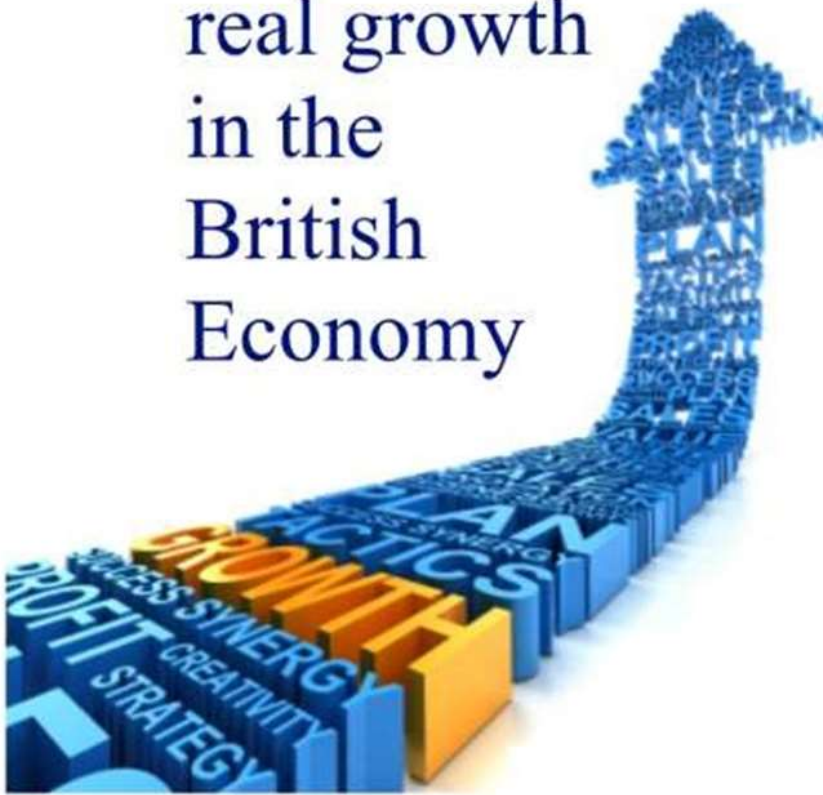


The Real Incomes Approach to Economics

Achieving sustained
real growth
in the
British
Economy



Hector Wetherell McNeill

SEEL-Systems Engineering Economics Lab

THE GEORGE BOOLE FOUNDATION LIMITED

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Achieving sustained real growth in the British Economy

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Preface

This document update¹ contains an economic policy proposition based on the findings of the Real Incomes Approach to Economics and designed to help the United Kingdom recover from the quite dire current economic circumstances we face in 2024.

The author initiated work on the Real Incomes Approach in June 1975 to enquire into why conventional economic policy instruments could not control stagflation without disrupting the economy and prejudicing companies and constituents.

By early 1976 this enquiry identified the stability or the rise in real incomes as the key economic indicator resulting in the subsequent development being named The Real Incomes Approach to Economics, with an initial policy proposal made in 1976.

It was apparent then that Keynesianism and the emerging monetarism could not eliminate inflation and as demonstrated during the whole of the period since 1975 to date (2024) these policies have failed to eliminate inflation.

There are two competing theories of money to explain the relationship between money volumes or aggregate demand and the prices of goods and services. These are the Quantity Theory of Money (QTM) as set out by Irving Fisher in 1911 as an identity which contains just 4 variables. Keynesianism, monetarism and MMT base most of their assumptions relating to inflation on this identity.

The other theory is the Value Theory of Money (VTM)² an identity elaborated by the author more recently and which contains 15 variables. The Real Incomes Approach is based on this identity.

How each of these theories of money is derived is explained in this document.

The QTM indicates that the prices of goods and services are proportional to a given volume of money giving a simplistic explanation of the cause and cure of inflation. In simple terms inflation is stated to be caused by excessive money issuance or aggregate demand. Therefore, by the same logic, inflation can be lowered by reducing money volumes and demand. This theory and the policy instruments used to address inflation are designed to address what is referred to as **demand pull inflation**.

The VTM contains the factors which first of all, determine the amount of money available to goods and services transactions because these factors are all money sinks that reduce the funds available for goods and service transactions.

Time lapse analysis of monetary flows and their differential impacts on these factor prices in the VTM results in a contrary view as to the cause and cure of inflation in the prices of goods and services..

In simple terms inflation is mainly caused by corporate price responses to rising input costs. Therefore, by the same logic inflation is raised by a failure to enhance productivity to lower unit costs and thereby reduce inflation. This theory and the

¹ This updates the previous document with the same title of January 2014.

² Originally referred to as the Real Money Theory this name was changed to emphasize it being an alternative to the Quantity Theory of Money.

alternative policy instruments used to address inflation are designed to address what is referred to as ***cost-push inflation***.

The Real Incomes Approach is, therefore, quite distinct from the theories and policy propositions of the conventional aggregate demand or money supply theories of Keynesian and monetarism as well as to the more recently emerging modern monetary theory (MMT).

On the fiscal procedural front, the Real Incomes Approach differs significantly from the fiscal variant known as Supply Side Economics (SSE) which emerged circa 1978 because the achievement of expected policy benefits are uncertain whereas Real Incomes policies only benefit companies that achieve policy objectives.

From this initial statement it will be apparent that the Real Incomes Approach is quite distinct from the conventional money volume/aggregate demand theories and policies.

Because of this fundamental difference in approach, a part of this document describes the impacts of 50 years of Bank of England interest rate cycles from low through high base rates, in order to explain why contrary to the monetary policy decision justifications we have witnessed an inability to eliminate inflation. An ongoing decline in the purchasing power of the pound and wages, a general decline in real incomes and growth, falling investment and a slow advance in productivity, deindustrialization, rising income disparity and poverty has been the result.

Such practical outcomes also point to fundamental errors in economic theory and choice of policy instruments because their application has imposed prejudice on constituents.

This document explains why the commonly accepted Quantity Theory of Money is flawed while introducing a credible substitute and a policy avoiding the logical traps into which the Bank of England has strayed.

I would like to acknowledge collaboration of the staff at the Getúlio Vargas Foundation in Botafogo Bay in Rio de Janeiro who assisted me in the early days (1975/1976) when I initiated some of the initial review of conventional economic theory and policies leading to the Real Incomes Approach to Economics.

I also wish to thank others who provided critical contributions and feedback on the different versions of the central proposal in the form of Price Performance Fiscal Policy (3P). In particular I wish to thank Robin Matthews whose suggestions transformed the policy from a specific counter inflation initiative into a general macroeconomic policy. Lord Harry Renwick arranged presentation meetings for me in London to receive some useful feedback on an early real incomes policy monograph. Richard Wainwright, the economics spokesman for the then Liberal Party called attention to various requirements which have been subsequently addressed.

Hector Wetherell McNeill
The George Boole Foundation Limited

22nd February, 2024.

Introduction

Britain has just 17% of its working population in industry and manufacturing and a trade deficit in manufactured and industrialised produce (goods) of around £220 billion. The rest of the economy employs 80% of the working population in a low wage services sector.

There is much stated concerning a green future involving the design, development and manufacture of new technologies and the creation of higher paying green technology jobs.

These are sound ideas.

However, to realise any of this there is a need for this country to undergo a transformation in economic structure placing more emphasis on appropriate training to develop the capabilities to identify gaps, propose and design solutions and to implement them by manufacturing the components and installing designed systems.

To support this change there is a need for increasing import substitution as well as to begin to develop new lines of manufactured goods and equipment for export.

The first section of this document provides an overview of why at the moment we face difficulties in achieving this needed transition as a result of past and currently applied economic policies.

1945-1965 – The period of rational economics

Robin Matthews, sometime Professor of Economics and Master of Clare College, Cambridge, published a paper in September, 1968 in the *Economics Journal*, entitled, “*Why has Britain had full employment since the war?*” The central point in this paper was that, in spite of the period 1945-1965 quite frequently subsequently being referred to as the “*Golden Age of Keynesianism*”, Matthews pointed out that in fact no Keynesian policies were applied for the very reason that there was full employment throughout that period.

On the other hand, it is well established that this period saw unprecedented levels of growth, rising real incomes, declining income disparity and many moving out of poverty. Indeed, since that time, the country has never achieved such rates of growth of around 2%-3% in real terms. The current account throughout the period remained positive while monetary policy remained deflationary.

This was a period when William Beveridge’s proposals on a welfare state called attention to the need to address the five evils of: want, squalor, idleness, ignorance and disease.

In 1966, and aware of the economic success of the previous 20 years, Nicholas Kaldor a Fellow of Kings College Cambridge in his inaugural lecture as Professor of

Economics, explained why Britain needed to maintain a robust industrial and manufacturing sector.

At that time, industry and manufacturing was employing around 38% of the working population. His reasoning was transparent. Designing and making products involves processes of innovation and rising productivity and refinement in gadgets and equipment and these benefits feed into all other sectors in a range of productivity enhancing effects including machine tools and equipment for manufacturing.

In other words, real incomes based on real gains in domestically generated innovation help drive the economy forwards gaining higher income skilled and semiskilled jobs. The additional benefits were that such an innovative industrial and manufacturing sector would also make possible effective import substitution as well as the development of a strong export trade thereby reducing any negative balance with respect to goods.

Where things began to go wrong

1965-1970 – The advent of “*The New Monetarism*”

It is worth commenting on an observation made by Kaldor around 1970, when he exchanged views with Milton Friedman via the Lloyds Bank Review under an article entitled “*The New Monetarism*”. Two things stand out.

1. Friedman had expressed the view in various articles that increasing money volume increased demand and this led to economic growth – one might refer to this as a consumerism approach (aggregate demand)

Kaldor suggested that this was the wrong way around, because it was companies in seeking finance to invest to create a new line of products or to improve a product or make its production more competitively priced, that increased demand in terms of the design, implementation of plant and production. This approach is one of supply side initiatives taking advantage of evolving possibilities to grow.

Therefore, *and this is important to understand*, the origins of demand and real growth come from the initiative of the supply side and not from banks or financial intermediaries. At that time, Kaldor considered banks to do a reasonable job in satisfying these requests for funding.

Real growth in this context, refers to operational changes in production that add incrementally more output for less resources thereby increasing goods and services while consuming fewer physical inputs.

2. More or less as an aside, Kaldor with a deep understanding of the British economy, also noted that up until that date, which I have to assume covers the same period as Matthews’ analysis (1945-1965), most investment finance came from supply side producer’s cash flow. This is something that is important to grasp because this “low finance period” (the inverse of Friedman’s assumptions) was associated with unprecedented levels of growth, rising real incomes, declining income disparity and

many moving out of poverty and a positive current account throughout the period. Monetary policy was deflationary with a base rate varying between 2% and 7%

The only way to explain this is to refer back to the benefits of innovation emanating from the self-financing supply side production industrial and manufacturing sector to support for all other sectors in the economy as Kaldor had explained in his 1966 inaugural lecture.

Matthews tentatively came to the same conclusion without making any reference to any of Kaldor's work.

Throughout this period workforce employment in industry and manufacturing remained reasonably stable at 38% to 40% and in services within the range of 52% to 54%.

The decline

1973-1975 – Towards a period of irrational economics

In 1973 OPEC raised the prices of petroleum as a sanction against petroleum importers because of their support for Israel in a series of military events linked to the question of Palestine.

The price of petroleum was increased sevenfold within a decade up until 1983.

A robust British economy began to falter with stagflation combining rising prices and rising unemployment.

Denis Healey as Labour Chancellor acted in 1975, against the advice of Nicholas Kaldor, to introduce monetarism as the dominant macroeconomic policy.

In arguing against this move Kaldor explained that we would end up losing investment, productivity would decline and falling competitiveness would create an inability of British companies to be able to import substitute and the country would face a rising import bill for goods leading to a rising negative balance of payments for goods. High paid skilled and semiskilled jobs would be lost ending up with a large low wage services sector.

What Kaldor predicted at that time is exactly the state we now find ourselves in.

This situation which continues to deteriorate can be referred to as irrational economics.

Coinciding with the introduction of monetarism as the main component of macroeconomic management, the period 1975 through 2024 saw a breakdown in the relationships that prevailed during 1945-1965. Growth rates declined, higher paid skilled jobs in industry and manufacturing have been lost, real incomes for the majority have declined, income disparity has risen with poverty. The balance of payments in goods, currently a deficit of around £220 billion, is the second most negative in the world.

Britain's percentage of the working population in industry and manufacturing dropped from around 39% to 17%, a decline of 54% and the services sector employment has risen from 53% to 80%. or a 50% rise or doubling of this percentage.

These circumstances were predicted by Nicholas Kaldor in 1975. His main reasoning related to the fact that a loss of industry and manufacturing would result in a loss of indigenous innovation putting British production behind the international competition so as to result in loss of higher paying jobs and the ability of British industry to sustain the supply of higher productivity products for the other sectors of the economy.

Danny Dorling, in his book, *"Shattered Nation"*, has introduced extensions to the five evils referred to by Beveridge more appropriate to our current state of affairs as a new set of evils of hunger, precarity, waste, exploitation and fear.

In reality these existed when Beveridge drew up his welfare proposals but Beveridge's headline evils have only been solved in a partial sense as is apparent from Dorling's extensions.

I hope that the following pages will explain how this erosion in Britain's development has taken place by paying attention to the single economic indicator of real incomes.

Real incomes

Real incomes are a measure of the economic power of the state, society, economic units and each individual as expressed in terms of the purchasing power of disposable incomes. Besides any accumulated wealth or assets, real incomes are the sole measure of the ability of any economic actor to access goods and services to meet their needs.

What accompanied the decline of the British economy since 1975 has been a fall in the real incomes of the majority associated with an inability of the monetary policy decisions to eliminate inflation. This has been a constant source of decline in the purchasing power of the currency and in cases where wage adjustments fell below accumulated wage depreciation due to inflation, generating a state of poverty for increasing numbers.

For more information on the significance of real incomes [see Annex 1, "Why real incomes?"](#)

The need to return to rational economics

While purporting to represent distinct approaches, Keynesianism, monetarism, supply side economics, modern monetary theory and fiscal decisions all consider money volume to be a decisive factor in determining demand, prices and economic growth. This belief is based on an acceptance of the logic of the so-called Quantity Theory of Money Identity (QTM).

The Quantity Theory of Money Identity (QTM)

For well over a century the macroeconomic decisions in this country have been increasingly dominated by monetarism which bases the logic of monetary policy decisions on the Quantity Theory of Money (QTM) identity especially in relation to inflation. However, this identity is flawed and this explains why the economy has shifted into irrational territory.

The Irving Fisher version of the QTM was first proposed in 1911 as follows³:

$$M.V = P.Y$$

where the product of Money volume (M) and the velocity of circulation (V) is equal to the product of average prices of goods and services (P) and quantities purchased (Y).

Y is also referred to as real income.

Our research has found that this identity does not adequately account for the relationship between money volumes and the prices of goods and services. This identity is in reality misleading as to the causes of inflation resulting in erroneous policy decisions.

The Real Theory of Money Identity (RTM)

The QTM does not account for the many “money sinks” that in addition to goods and services, absorb money in circulation. As a result, although P.Y might be estimated there is no basis for quantifying M. This is because the QTM lacks some 10 fundamental factors (variables) that act as money sinks.

The missing factors are largely assets including land, buildings, precious metals, commodity positions, rare objects and art, shares, financial instruments, and cryptocurrencies.

Savings and overseas flows are also important money sinks.

As a result, the representation of the relationship between the prices of goods and services and the volume of money is provided in the Real Theory of Money Identity⁴ (RTM) is as follows:

$$(M - (l + r + t + d + a + h + f + c + s + o)).V = P.Y$$

Where l is land, r is buildings, t is precious metals and objects, d is commodity positions, a is rare objects and art, h is shares, f is financial instruments, c is cryptocurrencies, s is savings and o is overseas flows.

³ Fisher, I. & Brown . G., “*Purchasing power on money*”, Macmillan Company, New York, 1911.

⁴ The previous name of this identity was the Real Theory changed to Real Theory of Money Identity to emphasise that it is a replacement of the Quantity Theory of Money Identity.

As is evident from the simple QTM, it is not possible to determine the size of M whereas the RTM deducts the funds that flow into some ten money sinks represented by

$$(l + r + t + d + a + h + f + c + s + o).$$

These reduce M to that used solely by goods and services transactions.

The QTM provides no such guidance to the actual amount of money tied up in goods and service transactions.

For more details on this extension see [ANNEX 2 “Theories of money”](#)

What does the RTM help explain?

All of these additional factors drag funds away from goods and services significantly reducing the actual volume involved in goods and services transactions affecting the income, margins, consumption levels (demand) and employment in supply side production and service provision.

The most significant outcomes of the substitution of the QTM by the RTM include the basic explanations as to why monetarism transformed rational economics into irrational economics leading to the decadence in the economy and giving rise to the state of affairs that Nicholas Kaldor predicted in 1975.

The full range of implications of the RTM are extensive but in this document I will only describe the more significant effects.

It is not demand or money volumes, it is costs

The first point is that whereas the QTM indicates that higher money volumes impact the prices of goods and services directly, the actual experience has demonstrated that money volumes do not directly affect the price setting of companies in competition.

At any point in time companies in competition have no incentive to raise prices simply as a result of rises in money volumes in order not to lose market share.

The Interest Rate Cycle-(IRC)

In spite of this reality, monetary policy decisions on interest rates go through a cycle of low interest rates phases followed by high interest rate phases in a process assumed to stabilise the prices of goods and services by varying the volume of money (M) in goods and service transactions.

Price responses under low interest rate phase of the IRC

For example, under the low interest rate phase of quantitative easing (QE – post 2008), the initial impact was to raise the prices of assets such as land, buildings and commodity positions while goods and service prices were not affected.

Inductive pricing

Assets possess a different property to goods and services because they are normally considered to be a store of value or wealth with a resale value that normally exceeds the purchase price.

Unlike most goods and services most assets are not standardised and the objective of sales agents is to obtain the highest price possible.

Although there is a competitive land and housing/building market, unlike the competitive goods and service markets with comparable qualities, each land or building sale involves distinct and different packages where prices are related to location, amenity, existing and prospective development and quality of the product.

Anticipatory pricing

There is a certain degree of reassurance associated with the fact that asset resale values are likely to be higher than the purchase price sometimes within a short period, causing agents to attempt to sell at the highest price feasible and projecting from that price the current upward trends in prices.

In contrast to households facing inflation in goods and service prices, asset buyers actively support the increasing rises in prices because of gains in wealth or income from reselling.

Besides fixed assets such as land and buildings a variant on anticipatory pricing is the holding of commodity positions or futures contracts in food, fibre, feedstocks and energy products based plant-based products (biofuels) and more significantly on hydrocarbons petroleum & gas which are closely related in price terms to some 6,000 derivatives used in most sectors such as plastics and fertilizer.

Significant commodity positions are taken by banks as well as hedge funds acting through subsidiaries or through agents representing very large amounts of commodities influencing the price of these commodities when the main users of these commodities are farmers, forestry, the timber, food, feed users, mills and refineries. Commodity position trading intervenes between sources and usage, causes these industries to face marginally higher input prices.

Structural inflation – Land, buildings & commodity positions

After prices of land and building and commodities have been raised through induced and anticipatory pricing a new costs structure is created as these assets become

inputs to production processes for goods and services and household budget items as rising costs.

This creates a structural inflation less influenced by current monetary flows and requiring companies to respond to these rising costs by increasing output prices to sustain profits and adding to the cost of living for households. Therefore, although the initial rise in asset prices is associated with monetary flow the inflation in goods and services is no longer monetary flow but rather cost-push.

Therefore, any action to reduce money volumes and aggregate demand through higher interest rates or taxation will have no impact on this cost-push inflation but will only serve to squeeze company profits and reduce family real incomes.

This is an important fact because all of the policy instruments available to the Bank of England assume that inflation in goods and services is caused by demand pull or excessive money volumes rendering these instruments to be both inappropriate and ineffective in addressing the structural cost-push inflation created in goods and services.

Even the rise in assets prices such as land and buildings is not solely demand pull but rather this is caused by the common practice of seeing assets as objects for the accumulation of wealth through price rises and therefore the prices are indeed driven by money volumes entering the market and a confidence of the fact that in spite of price rises they can be sold later at the higher prices or be used to earn rental income which can be raised in line with asset prices.

So, in the RTM the assets that generate cost-push inflation (l-land, r-buildings and commodity positions) have been capitalized in the identity below.

$$(M - (L + R + t + D + a + h + f + c + s + o)).V = P.Y$$

Thus, costs are raised and the cost of living rises with respect to goods and services while less money (M) is available for goods and services transactions.

Conclusion: Goods and services inflation is mostly cost-push.

An initial rise in asset prices due to money volumes entering these specific markets is transformed into cost-push inflation as these same assets are used as inputs to goods production or service operations.

Phantom investments in productivity-shares & financial instruments

Concerning the relationship between “growth” investment and productivity and the resulting GDP, there is the reality that around 50% of the rise in stock market turnover that arose during QE was the result of companies purchasing their own shares through buy back operations using cheap finance.

These operations were used to boost wealth and income of executives while this significant growth in the “performance” of the Stock Market had no impact on investment, productivity or real growth marginalising the relevance of price-earnings ratios.

The habit of driving financial instrument prices upwards through bid devices, paid-for ratings and crypto currency meant that during QE, the size of the economy rose significantly but was not the result of either investment or rises in productivity but was purely nominal growth in valuations of specific financial assets encouraged by the notion that they could be sold subsequently at higher prices.

To a large extent this was driven by the “hedging models” that thrive on a constant upward pressure and movement in prices which appeared in the early 1970s such as the Black & Scholes hedging model and which was rapidly used to expand computer-based trading and rapid expansion in derivative creation and trading.

The financial instruments “over the counter” grey market, a virtual black box, involves asset transactions and holdings approaching or exceeding the GDPs of the USA and UK.

So, in the RTM the assets that generate this significant “economic growth” while adding nothing to investment, production or productivity are visible.

GDP Growth? – precious metals, rare objects & art and cryptocurrencies

To the recorded growth in GDP the following can be added: highly priced precious metals, rare items and art, shares, financial instruments and cryptocurrency have also been capitalized in the identity below.

$$(M - (I + r + T + d + A + H + F + C + s + o)).V = P.Y$$

Conclusion: Many investment categories do not constitute investment or productivity enhancement. Much GDP growth is significant growth in the GDP and apparent levels of investment based on financial and other assets did not constitute raised wage-earner incomes, investment or raised productivity.

How monetary policy increases income disparity & poverty

It is also very apparent that the benefits in terms of wealth and income from the asset holding and trading, only affects a limited proportion of the country’s constituents who benefit directly from the impact of monetary policy decisions.

The result is a significant differentiation in incomes resulting in a constant rise in income disparity arising from the more significant impacts of money volumes on the incomes on those holding or trading in the assets capitalised in the following RTM:

$$(M - (L + R + D + T + A + H + F + C + s + o)).V = P.Y$$

Whereas inflation in the prices of assets greatly enhances the wealth, commission income or sales profits or rental incomes on assets the secondary cost-push effects reduce the real incomes of wage-earners as a result of the rise in the prices of goods and services.

Conclusion 1: Monetary policy augments income disparity. The direct boosting of asset prices as a direct result of QTM guided monetary policy decisions has favoured asset holder and trader wealth and incomes more than the wealth and incomes of wage-earners creating a rising income disparity.

Conclusion 2: Monetary policy augments poverty Assets feeding cost push inflation results in lower income wage-earners who do not benefit from fully inflation adjusted wages transitioning into a state of poverty where they cannot access basic essentials

For more information on the mechanics of income disparity and increasing poverty see: [Annex 3 "Income Disparity"](#)

Notice that all of these low base rate inflationary effects remain invisible in the conventional QTM's limited range of factors (M.V+P.Y).

Price responses under high interest rate phase of the IRC

How interest rates and taxation increase inflation

Moving from the low interest phase of the monetary base rate setting cycle to that of attempting to reduce inflation by raising interest rates and taxation it is necessary to understand the procedures used by goods producers and service providers to maintain profits in order to guarantee their future activity and employment.

A considerable amount of goods are imported to the United Kingdom and therefore there is a dependency on prices set by non-UK producers (exogenous price setting).

Both in the 1970s and now with the Ukraine crisis, the price of the commodities of petroleum, gas and their 6,000 derivatives including plastics and fertilizers rose significantly affecting most primary industrial production, there is a significant cost-push inflation raising production costs which has increased cost-push inflation intensifying income disparity and increased poverty.

Anticipatory pricing in goods & services

The normal business procedure to safeguard profits is to initiate a price setting strategy to ensure that the purchasing power of the company cash flow is sufficient to acquire the required inputs, which face rising prices, for the next production period.

This is another form of anticipatory pricing that differs from that applied to asset transactions. In the case of goods and services it tends to result in price setting being above the actual rise in costs inflation.

It is therefore inflationary and causes a lack of policy traction because this counters the intended impacts of the policy instruments of taxation rises or interest rate rises in impacting inflation.

Indeed, part of anticipatory pricing includes raising prices above actual input inflation so as to avoid high interest rate short term finance and raising the required funds from cash flow.

Conclusion: Anticipatory pricing protects corporate profits but raises inflation.

Anticipatory pricing is a common procedure deployed by companies to protect their profits, future activity and employment levels by raising prices so as to possess a cash flow able to purchase their next period's production inputs which face price increases.

For more information on anticipatory pricing see [Annex 4, "Anticipatory pricing as rational management"](#)

Interest rate and tax rises disrupt corporate operations & raise unemployment

The inappropriate application of policy instruments based on money volume, or aggregate demand based assumptions of demand pull, result in responses that increase costs and inflation and in particular the cost of living for constituents or wage-earners who do not always enjoy adequate counter-inflationary wage adjustments.

The combination of high interest rates and raised taxation to lower inflation has the effect of lowering demand for companies already facing rising costs either from uncontrollable imported inputs and goods or from the impact of the significant rises in prices and rents for assets used as production inputs.

The problem of wage adjustments and settlements

There is a perennial problem associated with the fact that using official inflation figures to adjust wages tends to underestimate the true accumulated depreciation in real

wages because official CPI and other bases tend to underestimate the true level of inflation. In any case the CPI basket contains products that are not weighted to individual family consumption patterns.

The current corporate accountancy and taxation regulations create a tendency for salary and wage rises being the last items to be adjusted while those nearer the corporate decision making levels tend to benefit from both higher incomes and more regular upward adjustments.

For more on the accountancy and taxation disincentive to raise wages see [ANNEX 5 "Accountancy & Taxation"](#)

The disruption of corporate operations and rises in unemployment

As a result, throughput declines as a result of diminished disposable incomes resulting from raised credit and mortgage costs leading to a rise in the overhead costs of companies producing and selling goods and services.

As a result, in association with falling consumer purchasing power, anticipatory pricing loses its ability to safeguard cashflow and profits leading to a policy-induced failure of companies and loss of employment which results in yet a further decline in demand.

In 2022, 20,000 companies closed in excess of registrations. The same occurred in 2023 and it is expected that 2024 will see 30,000 closures an expected total of 70,000.

Conclusion: Monetary policy increases corporate risks of failure

The application of demand-pull instruments on a generalised cost-push inflation disrupts companies by reducing demand and ability of consumers to afford output leading to corporate failure

The Bank of England uses inappropriate policy instruments

The overall result is that Bank of England monetary policy decisions might well result in reduced inflation but this is the result of an imposed damaging depression of economic activities. This is the result of a wholly disruptive and prejudicial approach which threatens corporate survival caused by applying inappropriate policy instruments.

Conclusion: Monetary policy is based on a flawed theory.

There is an erroneous assumption that inflation in goods and service prices is the result of excessive demand or money volume in line with the flawed QTM when in fact the problem is that all of the modes of inflation in the prices of goods and services are created by rising costs monetary policy intensifies this cost-push inflation as better explained by the full set of the variables in the RTM.

Bank of England decisions have radically reduced the purchasing power of the pound

Considering the analysis so far, it is apparent that whether in the low or high base rate phases on the monetary policy interest rate cycle, Bank of England decisions cannot eliminate inflation and end up with the unsatisfactory default target of a 2% inflation.

Over the last 50 years this policy target alone will have depreciated the purchasing power of the currency by 64% whereas the failure of monetary policy decisions has resulted in the average inflation having been of the order of 5% signifying a depreciation of 93%

Given that asset holders and traders saw their valuations exceed these inflation figures it is self-evident that monetary policy has and continues to favour asset holders and traders.

In an environment of a constant currency depreciation, those on lower seldom adjusted wages transition into a state of inadequacy to poverty to the degree of not being able to purchase bare essentials.

Therefore, monetary policy tackles real income declines caused by inflation by replacing this with real income declines due to policy-induced depression of nominal disposable incomes. This erroneous trade-off simply maintains the state of declining real incomes.

Conclusion 1: The result of 50 years of monetary policy has been a constant depreciation in the purchasing power of the pound and real wages.

Conclusion 2: Monetary policy creates a trade-off between real incomes decline from inflation and real incomes decline caused by policy-induced depression.

I will not dwell of the other “missing variables” of savings and overseas flows which, in reality, are significant and somewhat more involved.

But savings as has been seen were liquidated by QE for most greatly impacting pension funds in a prejudicial manner and under higher interest rates contribute to a reduction in demand.

Overseas monetary flows helped set up a vast array of offshore investments in countries with low wage levels which have contributed to the competitive decline in domestic industry and manufacturing production in the UK.

Conclusions

The period 1975 through 2024 has witnessed, as a direct outcome of monetary policies, as a prolonged period of:

- low investment
- lower than potential productivity
- an inability to eliminate inflation
- deindustrialization
- declining innovation and international competitiveness
- declining exports of goods
- inability to increase import substitution
- rising balance of payment deficit in goods
- loss of better paid jobs in industry & manufacturing
- rising income disparity
- increasing poverty
- The second most negative balance of payments for goods on the planet

This had the effect of depreciating a promising launch of a welfare state during the period 1945-1965 aiming to rid the country of the Beveridge's scourges of: want, squalor, idleness, ignorance and disease with a slow unwinding of these advances under 50 years of declining purchasing power we have ended up with Dorling's scourges of: hunger, precarity, waste, exploitation and fear.

In both cases the fundamental cause of a rising general lack of wellbeing was and is the development of increasing income disparity and poverty fuelled by the incessant march of a declining purchasing power of the pound.

Returning to rational economics

In order to reverse this state of affairs there is a need to recover industry and manufacturing so as to initiate a recovery of domestic production, expanding innovation, import substitution and a rise in the export of goods, to reconstitute employment with higher real incomes, it is worth dwelling on a statement made by Nicholas Kaldor on the topic of industrial recovery.

He stated quite clearly (paraphrasing) that in order for a sector to grow to become competitive companies would need to be subsidised and imagining that this was not the case is illusionary.

Given the reduced scale of industry and manufacturing in this country compared with the current industrial and manufacturing giants such as China and Germany both with larger internal markets, now operating for some time at a larger scale following many years of descent of their learning curves, as well as other global centres rising, most companies in Britain contemplating starting up or expanding will need some sort of assistance.

There is a need to only support what will become successful ventures that end up contributing to productivity enhancing investment and which as a result of such developments including more-for-less performance.

This cannot be achieved on the basis of grants, subsidised loans, or super-deductions, no matter how convincing investment proposals might be.

On the other hand, relying on government or committees to select “winners” has seldom turned out to be successful.

There is a need for the introduction of a less targeted policy which sustains a general drive towards increased productivity as the foundation for increasingly competitive pricing including price reductions in those activities where the technology makes this possible. At the same time, this transition needs to maintain a level of profitability in companies so as to guarantee future activities and employment.

It is necessary to bake into this solution the elimination of inflation which has been a scourge and fundamental cause of economic weakness in this country for over 50 years.

The existing monetary policy instruments cannot eliminate inflation and therefore need to be abandoned.

Towards a rational economics for national recovery

A general difficult to resolve problem under current policies is different forms of anticipatory pricing commonly applied under conditions of inflation, applied to the sales of assets, goods and services. This is justified as a rational financial management response to sustain profits, future activity and employment which, however, drives price setting to levels which actually increase inflation.

Real incomes and value added

Under anticipatory pricing companies “add value” by increasing their prices which on balance increases their real incomes while contributing to the reduction in the real purchasing power of consumers or a reduction in their real incomes. So, there is a zero-sum situation of “added-value”=“subtracted-value”.

This occurs more readily when even competing companies are driven to anticipatory pricing but also attempt to remain in competition. Therefore, under such circumstances “competition” does not solve the problem because all companies are compromised by inflating costs of inputs.

Under the Real Incomes Approach the concept of value added is modified to secure a state of reciprocal real income benefit for each counterpart in a transaction and to reduce or eliminate zero-sum situations.

Since the most natural defence for a company against cost-push inflation and a common practice, is to apply anticipatory pricing and concentrating on the effect on cash flow, this at least provides a foundation for building a policy mechanism based on the same cash flow objective. The challenge is to provide appropriate incentives to alter the situation to one of a general “positive systemic consistency” marked by reciprocal benefits.

Thus, the term “value added” under the Real Incomes Approach and has a different significance, is measured by the degree to which transactions become mutually beneficial.

To build up the policy approach, use was made of a corporate performance indicator the Price Performance Ratio (PPR).

The Price Performance Ratio (PPR)

In analysing anticipatory pricing in 1975 in Brazil the Price Performance Ratio (PPR) was developed as a simple ratio that measures the degree to which a company increases, maintains or reduces inflation.

The PPR measures the response of unit prices to changes in unit costs. It is measured as the percentage change in unit prices, divided by the percentage change in aggregate unit costs.

$$PR = \frac{(\%UP)}{(\%UC)}$$

Where:

%UP is the change in unit price;

%UC is the change in aggregate unit costs.

The aggregate unit costs includes the menu of components used to create a unit of output.

The PPR has useful properties in understanding the inflationary and noninflationary dynamics but also as a useful tool in identifying the policy mechanisms required to reduce inflation.

There are three main PPR value Cases as shown in the table below.

Price Performance Ratio values and corresponding inflation impacts, corporate profits and consumer purchasing power (real incomes)

Case	PPR value	Impact on output price inflation	Company Profits	Consumer purchasing power
1	PPR >1.00	Rises above input rate	Rise	Falls
2	PPR=1.00	Rises at input rate	Rise	Falls
3	PPR<1.00	Reduces below input rate	Fall	Rises

As can be observed as the PPR value declines from greater than unity (>1.00) to unity (=1.00) inflation continues to rise with profits and consumer purchasing power falls. However, Case 3 is clearly a zero sum situation prejudicing the company and favouring the consumer. However, in terms of reducing both inflation and raising consumer real incomes it is a preferable starting point to explore how to manage the question of a fall in profits.

In order to achieve the preferable state for consumers in Case 3 it is necessary to provide incentives to companies to lower their PPRs below unity (1.00). In this range of PPRs, the PPR measure the increase in real income or purchasing power increment the company adds to a transaction as a more relevant measure of value added.

Common incentives

A common problem with economic incentives is that many can be attractive to businesses but from the standpoint of the national interest and policy objective they often fail to deliver. Typical examples include grants, subsidised loans or super-deductions. This failure is related to the fact that a large number of investment projects fail⁵.

⁵ Even under strict regulations for project approvals being subject to a detailed Cost-Benefit Analysis (CBA) some 35% of World Bank projects fail not always because of poor design but rather because the Board has an

A celebrated example of this is the outcome of the so-called supply side economics (SSE) fiscal variant of marginal tax discounts for higher income constituents on the grounds that this would result in higher investment disguised as political party handouts to those most likely to contribute to party financial contributions. As expected SSE did not have the impact justifying its application but, rather, resulted in increased income disparity.

In practice, the way these incentive schemes are managed seldom has any means of ensuring that the desired policy objective or higher productivity, is achieved. This can be related to the fact that such “incentives” are used as political party “give-aways” as means of gaining voter support and corporate donations.

As can be appreciated with the continuous depreciation in the currency purchasing power and an environment that marginalizes companies as a result of imposed reductions in demand and rising overheads as described above, creates a good deal of uncertainty. Indeed, it is more likely that those in the most precarious state of affairs will be applying for such assistance raising the risks of monies not being well spent.

Another issue is how are queues for assistance to be created when one is dealing with a whole economy and different classes of industry and manufacturing?

To ration available funds, some form of objective prioritization would be required.

Given the scale of the problem facing Britain it is not rational to risk selecting priorities because the directions of technological advances and markets are often not sufficiently well understood.

Price Performance Fiscal Policy (3P)

Companies not only face cost-push pressure but also need to pay corporation tax which today represents a significant component of gross profits.

By changing the nature of corporate taxation to one that is levied according to the degree to which transactions have a reciprocal value added, it is possible to reduce inflation while augmenting the real incomes of both producers (profits) and consumers (reduced cost of living).

The proposed policy designed to apply this principle is **Price Performance Fiscal Policy (3P)**. This takes advantage of the PPR as a performance indicator and makes use of a simple policy instrument, the Price Performance Levy as a corporate tax to provide a positive incentive to companies to lower their PPRs to secure higher net of PPL profits.

overriding influence of governments with less interest in such oversight leading to only around 20% of funded projects receiving CBAs.

The Price Performance Levy (PPL)

The most effective way to provide incentives is to allow the development of competitive advantage to be stimulated bottom up on a profitable basis while securing rising productivity and expanding real growth and incomes at the national level.

This can be achieved by varying corporate taxation as a function of the PPR.

The principal objective of 3P is to assist companies who effectively reduce the rates of increase in inflation or the secure absolute reductions in unit prices by subjecting them to a lower PPL they end up with a higher net of levy margin or profit and to cause companies not delivering on the unit price reduction objective to pay a higher PPL and end up with a lower net of PPL margin.

PPL formulae

There are many ways to construct suitable PPL formulae. One basis for building suitable PPL formula is to have a basic tax rate of say 20% and an additional function related to the PPR that augments (surcharge) or reduces (rebate) on the 20% according to the PPR value so as to vary the net of PPL margins received by companies.

For example, the following is a power function for the PPL:

$$PPL = B.PPR^2$$

To see the operation of this PPL the table below shows the net margin obtained with different PPR scores.

Variation of net margins with PPR

Gross margin	PPR	PPL	Rebate (-) Surcharge (+)	Net margin
100	1.20	28.8%	+8.8%	71.2
	1.00	20.00%	0.0%	80.0
	0.8	12.80%	-7.2%	87.2
	0.6	7.20%	- 12.8%	92.8
	0.5	5.00%	- 15,0%	95.0

As can be observed the net margin rises substantially according to the movement of the PPR below unity (1.00)

This is an effective way to provide incentive by promoting the development of competitive advantage to be stimulated bottom up on a profitable basis while securing rising productivity and expanding real growth and incomes at the national level.

The 3P policy mechanism makes use of existing market forces by allowing the income price elasticity of consumption (demand) to create an acceleration in market penetration and growth in sales of goods and service dissemination of those

companies who are successful in satisfying policy objectives by becoming more price competitive.

For more information on income-price elasticity of consumption(demand) [see ANNEX 6 “Prices and consumption relationships”](#)

This will occur where products are needed but in the absence of government orientation interference or prioritization. Therefore, the policy outcome is governed by the free expression of actual market requirements.

There can be families of PPL schedules using different formulae and some examples are provided in [ANNEX 7 “Some alternative PPL schedules”](#)

Business rules

In order to take full advantage of 3P, companies can follow the transparent logical economic and financial procedures to maximise their profits and the reciprocal value added for both the company and their customers.

It is therefore of fundamental importance that business rules associated with 3P remain logical from the standpoint of finance and economics enabling companies to maximise their economic & financial objectives.

From price takers to price setters

As opposed to applying marginal cost pricing⁶ as a price taker, which assumes a static productivity, 3P provides a low risk opportunity for companies to operate in a more proactive and entrepreneurial⁷ fashion as price-setters.

This also takes advantage incremental productivity options to secure more competitive prices so as to gain an increased market share.

The appropriate calculations and decisions to secure improved prices in the short term while sustaining traction in improving productivity over the medium term can be achieved by following the analytical sequence, or set of business rules to guide decision analysis and action as follow:

BUSINESS RULES

1. The recording of the current prices in the market
2. A review of the feasible technical options to reduce unit costs

⁶ Although a commonly taught theoretical procedure to optimise price setting it would appear that in practice this is not applied widely.

⁷ Jean-Baptiste Say regarded entrepreneurs as individuals who improved the efficiency with which resources are used across single or multiple processes and tasks

3. The comparison of projections of cost trajectories for alternative technical packages identified and based on the learning curve coefficient⁸
4. Selecting a target price that increases the quantities sold based on the price elasticity of consumption (demand)⁸
5. Calculating the associated PPR and PPL combination to minimise the net of PPL profit
6. Calculate the most advantageous projected revenue (cash flow)

Items 3 and 4 relate to a point in the future such as 12 months or 18 months determined by the nature of the process technologies used so as to identify an expressive or meaningful reduction in unit costs and an associated price providing an adequate profit.

Therefore, price setting procedures will refer to current prices only as a reference to calculate the feasible price reduction according to the technical possibilities and the rise in volumes sold at a relatively lower price.

Short term reduction in inflation & sustained rising productivity

Remembering that the objective is to reduce inflation in a meaningful way and that price reductions cannot become promises that create uncertainty concerning whether the policy is effective or not, it is necessary to take what is perhaps a counter-intuitive decision.

Once an adequate combination of an advantageous identified future target price and unit cost reduction methodology has been agreed, the immediate next step is to reduce the output price to the target price level **at the initiation of the cost reduction period** rather than at the end of the projected period.

This not only has an immediate impact on inflation reduction it activates the PPL rebates so as to provide a higher net of PPL profit while the lower unit price also results in the benefit of a growth in sales volumes.

Achieving a sustained rise in productivity

The effect is to combine short term unit price reductions with a sustainable process of productivity enhancement.

Marginal cost pricing usually assumes a fixed input-output productivity relationship whereas 3P Business Rules seek to maintain a sustained change in input-output relationships by altering the technology and techniques applied.

This has the added advantage of building in policy traction.

⁸ For further information on learning curve coefficients see ANNEX 8 Geometry of the Learning Curve ⁸ For further information on the price elasticity of consumption (demand) see ANNEX 7 "Price and consumption relationships"

Reducing unit prices usually requires a means of reducing unit costs involving substitution of more expensive inputs, changing the technology to make use of lower cost inputs or by raising the productivity of processes using the current complement of inputs through redesign, automation or making use of the most efficient state of the art technologies.

Increasing throughput & the Learning Curve

Price competition favours the companies with marginally lower prices because throughput rises and this accelerates the unit costs reduction gains associated with the Learning Curve.

As a general heuristic this exhibits an equivalent reduction in unit costs associated with each historic doubling of throughput (production).

The development of the capabilities of humans and technologies

A necessity for a successful application of 3P Business Rules is an understanding of the development and interaction of the capabilities of humans and technologies

There are two components to this understanding:

- The specific role of human learning in economic development
- The specific contributory relationships between human learning & capabilities and its relationship to innovation

These are intimately intertwined but it is instructive to separate them to first understand the processes involved in creating at corporate level the types of change that can define prices which in aggregate generate economic development.

Tacit & Explicit Knowledge

The first component is the distinction between tacit knowledge or the cumulative human competence in carrying out tasks and its relationship to explicit knowledge, the cumulative information that informs management of the courses of action to take in relation to the required organizational and possible technological change.

For further information on these important topics on the development of human capabilities (tacit knowledge) and the use of data to improve technological productivity (explicit knowledge) see [Annex 8 “Tacit & Explicit Knowledge”](#)

Technology & techniques

Placing the 3P business rules in the context of national development it is important to acknowledge the established fact that the majority of economic growth is the result of

learning as laid out by a considerable amount of research conducted by several economists⁹.

Learning, very much linked to the components reviewed under tacit and explicit knowledge is what leads to changes in how tasks are performed, transforming them into new approaches involving advances in technology and technique or innovation.

This fundamentally important evolutionary process is what Joseph Schumpeter referred to as “creative destruction” very much associated with entrepreneurialism.

For more information on the contribution of learning to economic development see [Annex 9 “Technology, technique & real incomes.](#)

Government revenue & real incomes

Taxation is commonly considered to be a means of raising revenue for government even although it is also part of the process of controlling demand as a component of policy guided by the Quantity Theory aggregate demand or money volume logic on inflation control.

From our analysis of the RTM (Real Theory of Money) we know that the quantitative function for inflation control is invalid meaning that taxation as a revenue seeking mechanisms for government becomes more relevant¹⁰.

Loss of government revenue?

The benefit of 3P is that it does not make use of any government funds but operates entirely on the basis of making use of corporate money. On the other hand, the government receipts will fall as a function of companies becoming more productive and competitive and reducing inflation.

Unlike Supply Side Economics the expected results of marginal tax reductions are not based on hope or conjecture but are based on delivered results of real growth indicated by the PPR. Indeed, this approach transforms government imposed taxation based on the PPL into a catalyst for measurable growth.

Referring back to the notion of V the velocity of money in the theories of money, in the case of Price Performance Fiscal Policy each transaction acts as a multiplier of real incomes.

The real incomes multiplier

Below unity, the PPR indicates a reduction in inflation or prices or a real incomes value added effect associated with policy traction.

⁹ Wright, Kaldor, Solow, Arrow, and historically Say & List

¹⁰ For the moment ignoring the MMT construct that revenue through taxation is simply eliminated.

With so much imported to the United Kingdom and much activity being essentially off the shelf product logistics or assembly, the current ability to lower unit costs is limited. However, the longer supply chains within the country operating within a 3P policy framework and the greater the number of participants, the more that each transaction augments the gains in real income resulting from the reduction in inflation.

For example, the table below shows three imaginary supply chains with a single company between an imported product and the national consumers, a two company supply chain and a three company and four company supply chain before reaching the consumer.

Assuming each company has a PPR of 0.80 and that the inflation rate of the imported product is 10%, the level of inflation reduction is as indicated.

Supply chain multiplier effect on a 10% inflation input on consumer level inflation and real incomes

Input inflation	Average PPR per company	Number of companies in the supply chain	Cumulative PPR	Consumer price inflation
10%	0.80	1	0.80	8.00%
		2	0.64	6.40%
		3	0.51	5.12%
		4	0.41	4.10%

Each node contributes a marginal reduction in inflation while the chain delivers a substantial reduction and real incomes multiplier effect.

At first, this Real Incomes Multiplier under conditions of inflation would only be reducing the rate of inflation but at some point, depending upon the technologies involved it is feasible for the chain to deliver lower unit prices with no inflation as opposed to lower inflationary prices.

So, repeating the multiplier calculations with a lower initial inflation of 5% the results are on the next page.

Differences between industrial and manufacturing companies and services

Obtaining lower PPRs is easier in industrial and manufacturing companies that have a wider range of options to alter operations, technologies, individual component substitutions and automation. Because of this they also have a greater chance of developing innovations to reduce unit costs and reduce their PPRs.

Supply chain multiplier effect on a 5% inflation input on consumer level inflation and real incomes

Input inflation	Average PPR per company	Number of companies in the supply chain	Cumulative PPR	Consumer price inflation
5%	0.80	1	0.80	4.00%
		2	0.64	3.20%
		3	0.51	2.55%
		4	0.41	2.05%

Service companies, on the other hand, to a larger degree are dealing with “off the shelf items” often imported directly into the country where there is little opportunity to alter the delivered product or service.

Within services, use of better logistics and information technology management and oversight can help reduce operational costs as can be appreciated from the high tech platform services on the World Wide Web integrating sales, accounting, product and service delivery and logistics including returns and handling of transactional finance.

In terms of the high end services such as advocacy, law and accountancy the advance of information technology and of late digital intelligence (AI) is creating inroads to these services and reducing the costs of such services with an inevitable decline in the accessible fees in these professions. There is therefore a likelihood that the services sector will become an increasingly low income sector while services related to technologies, systems engineering, product and process design will begin to represent a high income segment.

Service concentration

Another factor threatening the part of money volume (M) and income dedicated to individual practitioners is the high degree of concentration of control over market segments by high tech platforms. This is likely to affect currently highly paid service professions. This phenomenon has been explored by Yanis Veroufakis in the case of corporations creating another layer of income disparity between high tech concentrators and production companies in his book “*Techno-feudalism: What Killed Capitalism*”

Industry & manufacturing potential

The more the structure of the economy raises the participation of industry and services the more opportunities will arise for innovations and green industries and manufacturing based on a sustained delivery of rising productivity based on the more-for-less principle then the greater will be the opportunities to reverse the decline in the economy.

Technology & price reduction

Besides the application of the PPR and PPL to reduce inflation the other means of reducing costs to such a degree that unit prices can be reduced is a common feature of some technological advances such as information technology and digital devices

In 1965, Gordon E. Moore predicted a steady rate in the increase of the increasing capabilities of placing more logical circuits onto a given area of integrated circuits known as Moore's law¹¹ has revolutionised modern digital technologies by lowering the costs and raising the processing power of digital capabilities on a constant basis.

It is therefore quite common to see digital devices being sold for lower prices while consuming less energy, possessing more processing power, being smaller and lighter.

As a result, IT can add digital processing or AI to many mechanical and other products improving their ease of use, convenience and utility.

Currency purchasing power & real incomes

Therefore, the ability of a supply chain to share out the burden of reducing inflation should increase more rapidly with industry and manufacturing thereby increasing the viability of the policy to maintain corporate profits and market penetration with products with increasingly competitive prices leading to an increase in currency purchasing power and the real incomes of all.

Climate action, the environment & ecosystem and planetary carrying capacity

Just as there are business rules for increasing productivity, reducing or eliminating inflation so there is an important additional set of business operational criteria needs to address the climate crisis and ecosystem preservation.

3P business rules and the environmental challenge

There has been much media coverage of the high cost of introducing what people refer to as the "Green Agenda" referring to red tape and regulations apparently throttling companies and threatening business viability.

3P business rules set off decision analysis on changes in technology in the appropriate direction in terms of environmental protection but in each case consideration of environmental impacts is, of course, required.

It is not altogether apparent why beyond a well-informed business community why addressing climate change and ecological and



¹¹ Moore, G. E., "Cramming more components onto integrated circuits", Electronics, Volume 38, Number 8, April 19, 1965

environmental preservation is such a challenge. In many cases it is an excuse not to do anything but allow the state of affairs proximate states of no return and a global threat to society.

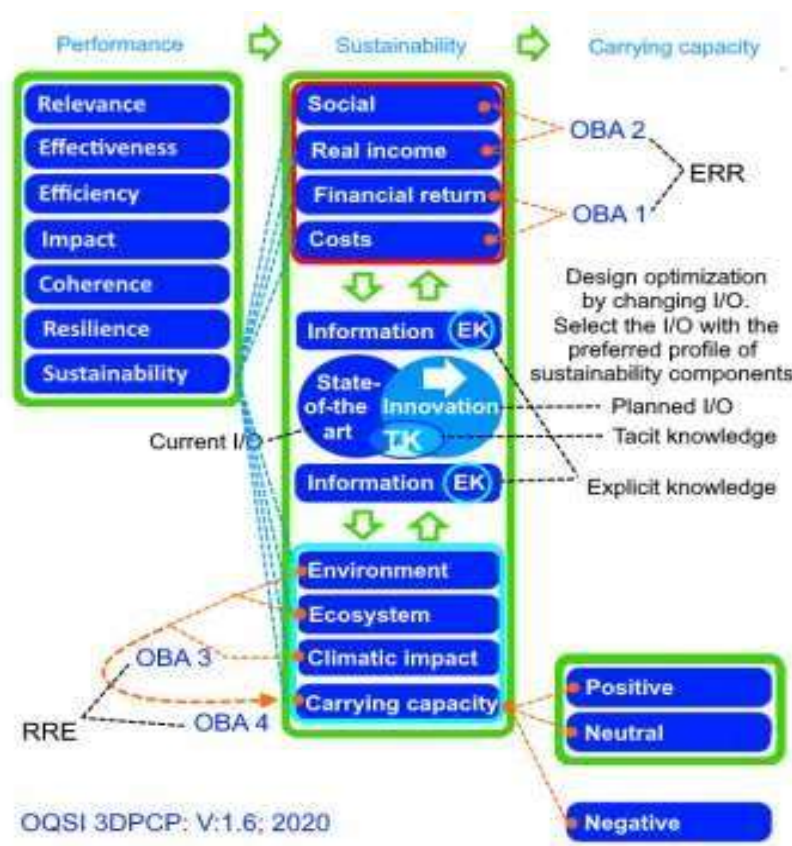
It is proposed that given the complexity of handling specific technological questions of the specific impacts of different technologies on the environment that the proposed National Process Systems Service (NPSS) should place particular emphasis on this aspect of productivity decisions.

Indeed, with the introduction of more exacting environmental regulations in the European Union is became necessary to introduce an advisory system to assist farmers apply them. Across all sectors, this is more of a challenge covering all types of technologies and for this reason there is a need for a major effort to have a centre capable of handling these types of questions.

The George Boole Foundation initiated a quest to address these questions in 2010 under the Decision Analysis Initiative 2010-2020 which gave rise to the Open Quality Standards Initiative (OQSI) which developed practical procedural methods to assist companies complete a critical path analysis that helps decide the appropriateness of any technological decision.

The OQSI Critical Path is shown below.

OQSI Critical Path



McNeill H. W., "Parts 1 and 2, "Project and macroeconomic coherence for Agenda 2030 Sustainable Development Goals", Agricultural Innovation, 2020

OBA's are options benefit analyses similar to cost benefit analysis but they work in a reciprocal fashion to determine economic rates of return (ERR) or rate of return to the environment (RRE).

Thus, OBA1 is a standard cost-benefit analysis; OBA2 is a cost benefit based on social viability and real incomes; OBA3 is environmental/ecosystem impact analysis; OBA4 is the resultant climate (emissions) and carrying capacity impacts.

The basic changes in technology and processes are subject to performance criteria similar to the OECD DAC criteria only OQSI added the additional criterion of resilience as a measure of helping avoid sustainability being undermined by varying economic or natural conditions. The performance criteria are therefore:

- Relevance to objective
- Effectiveness in achieving objective
- Efficiency in achieving objective
- Actual expected impact
- Coherence with policy objective and other actions
- Resilience of variations in conditions in markets and environment
- Overall sustainability

The OBA's essentially assess sustainability of options covering the following sustainability criteria:

- Social
- Real income
- Financial return
- Costs
- The technical change option
- Environment
- Ecosystem
- Climatic impact
- Carrying capacity

As can be seen all of this assessment a matter of mutual existential interest is in to assess the appropriateness of different technological options centred around more-for-less production systems identified applying the 3P business rules.

Technologies are adjusted in a reiterative fashion according to the feedback information (explicit knowledge) from the two assessments of economic rates of return (ERR) and rates of return to the environment.(RRE).

Any change that ends up with a negative carrying capacity is rejected.

The critical path to be followed remains within the green boundaries.

The OQSI Critical Path can be applied to analysing changes in any production system.

The Value Theory of Money

Adjusting money theory to account for productivity

Now that the role of Price Performance Ratios have under the 3P policy framework has been explained, it is now appropriate to adjust the Real Theory of Money identity to reflect the significance of productivity in establishing it as an important means to increase the value of the currency and real incomes.

Therefore, taking the Real Theory of Money identity it is appropriate to indicate the role of productivity in impacting prices by introducing the PPR into the identity.

The PPR can be placed into the identity as a weighting used to adjust the average price P.

In the identity below, it is introduced as a “w” indicating a weight but it is identical in value to the average PPR.

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

Where: w is the average Price Performance Ratio.

The Value Theory of Money

This is a new identity has been named a **Value Theory of Money (VTM)** to emphasise its representation of the main variables that determine the amount of money in the goods and services transactional domain as well as the purchasing power or **value of the currency** as the foundation to stabilizing real incomes.

This is a significantly different perspective on the cause of inflation from the century-old Quantity Theory of Money which provides no guidance either the amount of money in the goods and services transactional domain or to average price levels or real incomes even although these variables exist in the QTM as P and Y.

The VTM maps over the 3P policy framework to provide a coherence between the functioning of the economy and the effectiveness of policy (3P) because the PPR is represented both in the theory and practice.

The VTM and 3P correspond to the actual cause of inflation as cost-push while the QTM assumed mistakenly that inflation is caused by demand-pull. As a result, the appropriate policy instruments are not interest rates or fiscal revenue seeking variations but rather price moderation and productivity.

Price Performance Fiscal Policy administration

National Production Systems Service

In order to provide an access to a general guidance for corporate management on how the performance of the technologies and techniques used in their companies compares with sector performance, an extension system under a suggested name of National Production Systems Service (NPSS) is proposed as a multisector extension system.

Extension systems gather information and conduct research to establish the ranges of feasible performance of different production and handling systems in a sector.

Extension systems have existed in agriculture for many years. To guide those contemplating change to improve performance and profitability, extension systems uses analysed field data to provide reports containing information on the relative performance of different types of process in a sector based on existing systems classified as best, average and poor practice often associated with corresponding gross margins.

This has the purpose of alerting managers to when their performance is below par and provides information on how to improve performance related to the management of the basic technologies as well as the techniques used by operators and labour.

The NPSS would be best organized as a partnership between sector companies and universities in order to keep engineering and economic faculties abreast of state of the art of national production technologies as well as identifying areas where possible improvements can be made.

For further information on extension systems see [ANNEX 10 Extension Systems](#)

Climate crisis, environmental conservation and carrying capacity

On pages 36-38 under the subheading “*3P business rules and the environmental challenge*” the role of business rules in supporting environmentally sound change would be a significant part of the NPSS operational advice.

Instead of adding “red tape” to this transition the NPSS would be geared to emphasising productivity as a central means of mitigating the costs involved in change through an optimization of scheduled changes to maximise the PPL rebates.

Process reference models-PRMs

The practice performance benchmarks or reference to good, average and poor practice refer to functioning processes with quantitative inputs and outputs and process flow data including inputs, production capacity, capacity utilization, working hours each day, and associated product yields (to desired specification).

This data provides the parameters for simple Process Reference Models (PRMs) that can be based on object oriented process names and methods with inputs as objects with names and properties.

PPIMS-Price Performance Information Management System

Today it is well within the capabilities of information technology and communications to manage 3P at the individual corporate level as well as the level of the government administration.

In a macroeconomic policy environment, the process of administration dealing with data collected on corporate operations requires an integration of a system to collect relevant operations data on inputs and outputs but also a treasury function whereby PPL rebates and surcharges are made to a corporate account in real time.

Because of the relative complexity and the risk of mistakes or fraud, it is necessary to build in automation to a standardised computer program that calculates PPRs and PPLs.

The records of input transactions and sales need to be recorded based on actual transactions making use of separate procurement and sales trading floors.

Trading floors

Trading floors are interfaces where buyers and sellers can transact on a contractual basis with all of the transacted items being members of agricultural, industrial, and service input and sales object types, each with specifications or properties and object identification tags. Use can be made of object oriented factors of objects by name and properties (specifications).

These can be automated along similar lines of how, for example, today's Amazon system operates.

Procurement trading floor

The trading floor for procurement of inputs would normally be a business to business setup (B2B) with an interface allowing lookup on product specifications and prices where traders wish to view products or on an automatic basis with buyers setting maximum prices for specific types of input with stated properties and leaving the system to match requests to offers and to close contracts and record details of the transactions.

Sales trading floor

The trading floor for sales of output would be business to business in the case of capital goods and business supplies but can also be similar to online sales systems wholesales trade and like Amazon for business to consumer operations.

Database Technology

All of this data can be held in an Accumulog¹² or immutable database for any required audits or oversight and for following up on any forms of dispute.

Modern SQL databases can handle such a requirement with ease.

Conversion of transactional records to PPR & PPL estimates

Based on the list of components making up units of output in standardised systems and transactional records it is possible for PPR and PPL estimates to be calculated automatically for set periods established as the periodic estimate duration.

Treasury function

The settlement of PPL liability should be an automated real time process which operates on the termination of each assessment period to be decided (somewhat like VAT periods).

PPL payments would be credited to a government account. The number of surcharge payments and their amounts would be used as indicators to an NPSS alert system indicating issues with a company's performance under 3P related to an inability to lower prices or unit costs activating a query concerning the offer of a consultation to review options to improve performance.

Rebate recycling

If on assessing non-performance to be due to errors in price-setting or technological changes introduced and where credible options exist to achieve price reductions or appropriate technical changes in support of such prices then the total surcharges made within the previous non-performant year can be returned to the corporate account based on audited use of those funds for the new production plan.

In other cases, the state-of-the art performance reference practice benchmarks might indicate that difficulties in processes using specific technologies to deliver desirable gains in unit cost reductions or price reductions where it would then become possible to identify sub-sector applied research & development priorities to be passed to appropriate teams at universities or systems groups by the NPSS.

Policy administration system-PAS

The corporate level systems described would be essentially terminals of an online system with the data centre located at the appropriate government central administration for this policy.

Reference to the NPSS data and company activities the PAS system would exercise oversight of two areas:

- National performance estimates

¹² Accumulogs were identified as an essential requirement for recording online transactions by the author in 1985 while developing locational-state theory at the ITTF (Brussels) in 1983-1987 as a means of ensuring data transmitted for business decision analysis is reliable. <http://www.accumulog.com>

- Risk analysis

Corporate privacy

It is to be expected that there could be a reluctance of companies allowing an agency that is concerned with corporate levies have access to their trading operations data.

There is an example of the European Commission FADN (Farm Accountancy Data Network) and the former UK NAAS (National Agricultural Advisory Network) both of which collect or collected extremely detailed input costs and produce price data and accounts. In the UK case in exchange for optimised farm plans to augment profits, each year the agreements with the farmers were that none of the data in these data sets were to be shared with tax authorities.

Any published data would be of average figures for at least 5 farms falling into a specific size and production systems category.

As explained below, it is suggested that this system should start off in a voluntary manner in the spirit of the PAS being very much a system attempting to augment corporate performance by catalysing price competition, profitability and a sustained process of innovation.

In reality 3P should be viewed as a productivity system within which in effective terms, there is no corporate taxation but rather a system that assists companies excel in their performance.

Although starting off as a voluntary scheme it is to be expected that companies on the 3P basis of operations will out-compete companies operating within the conventional corporate taxation system and thereby attract more participants.

Information classes

Work with sector panels formed at the Information Technology & Telecommunications Task Force (Brussels) to review the potential contributions of online information to support EU businesses were formed in the early 1980s in the knowledge that the Internet would form the backbone of a global system.

On the question of information sharing there were three basic classes

- Information disseminated to promote the interests of a sector to the public
- Shared information on state of the art technologies and economic performance benchmarks to assess and guide productivity increases
- Confidential information of specific in-company techniques and procedures considered to provide competitive edge.

National performance estimates

Quarterly reports on sector performance and resulting price stability (inflation) can inform government and the Chancellor on whether or not changes in base rates or PPL formulae need to be made.

This is because in some areas of applied technology the current challenges might be too high to achieve meaningful improvements in productivity.

Risk analysis & Intelligence

Risk analysis and intelligence refer to detecting problems with the operation and oversight of the system and work on the degree of progress of some sectors towards achieving internationally comparative performance to expand import substitution and exports.

Introduction of the system

To minimise risks, it is suggested that the introduction of 3P should be as a voluntary scheme rather than commit to the system for the whole country. There is a need to assess how the system works in practice and its ability to reduce inflation as well as debug the corporate and central administration of the system.

In theory, those volunteering to operate under a 3P scheme should find that they become more competitive than those under the existing corporate taxation schemes. If so the number of volunteers joining the scheme should grow.

Wage contracts and settlements

Although the reduction of inflation and likelihood of specific technological processes being able to reduce prices such as in digital technologies, the purchasing power of pound and therefore the real wages should rise. However, given the importance of human learning to rises in productivity 3P could create a basis for PPL rebates being considered to be bonuses to be shared between companies and the labour force.

If the 3P results in a substantive rise in the purchasing power of the currency then there is the option to introduce schemes where labour to be taxed at the same rate as companies based on the PPL with rebates over and above the base rate being paid as bonuses.

Mutual & cooperative companies.

Mutual and cooperative groups can benefit from 3P because their members are the shareholders and therefore would benefit directly from a 3P scheme. Mutual and cooperative structures, because they do not have external shareholders or shareholder value targets, benefit from an estimated 11% to 5% operational costs advantage and 3P can help lever this benefit especially in the case of smaller companies.

In this case the 3P rebates can benefit the “workforce” directly.

More for less productivity

More for less signifies less resources consumed to produce a product or service and this provides a foundation for the stimulation of the types of technologies that are more conducive to resources conservation and ecological balance as baseline states to tackle climate change related to rising temperatures.

Concluding

This document has explained the shortcomings of monetary policy in terms of flaws in the Quantity Theory of Money (QTM) and has provided an alternative Real Theory of

Money used to explain why decisions based on the QTM have resulted in an inability to eliminate inflation while imposing reductions in real incomes.

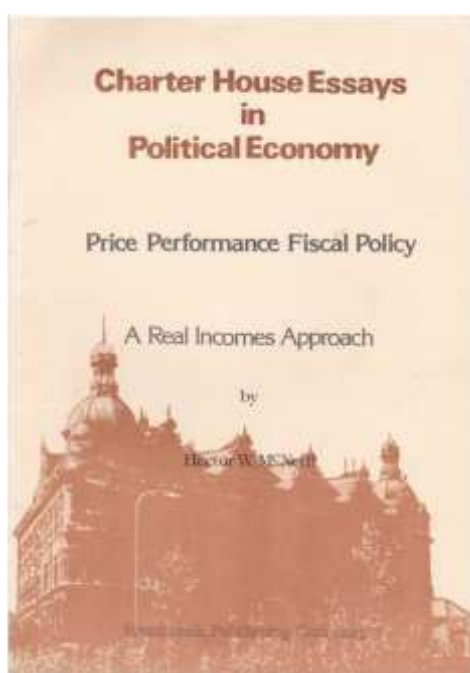
Over the last 50 years this has resulted in a deindustrialization, falling investment and inadequate productivity gains, falling real incomes, rising income disparity and poverty, rising imports and a large negative balance of payments in goods.

A proposition, in the form of a Price Performance Fiscal Policy (3P) has been presented as a way to accelerate a return to real growth based on unit price reductions in goods and services and a sustained policy traction of rising productivity. The productivity structure under 3P is a more-for-less transition as opposed to the confusion of money volumes or aggregate demand as generators of inflationary relatively unproductive and wasteful “growth”.

A general outline of a corporate and national administration system for 3P is outlined. A general approach to the climate and environmental crisis is outlined referring to the OQSI Critical Path used to assess the suitability of proposed changes to more-for-less production systems.

Early feedback received on 3P

In 1981 feedback on a monograph of 3P resulted in useful suggestions.



The cover of the 1981 monograph on 3P, circulated to British political parties. This was also the first edition of the series *Charter House Essays in Political Economy*

Robin Matthews, Professor of Economics at Cambridge University, while considering the system to work for inflationary conditions, suggested that the PPR formula I had proposed needed to be adjusted to explore what would happen under deflationary conditions. At that time the analysis only assumed rising inflation, the condition under stagflation when I started this work in 1975. I therefore altered the PPR formula which had the effect of making 3P a generic macroeconomic policy.

In a meeting with Len Murray the General Secretary of the TUC, it was obvious the monograph had not been read and that Labour were tied to following decisions made by the TUC.

As a result, there was little receptivity.

Lord Harry Renwick arranged meetings with people from the Conservative party amongst which a senior manager from KPMG audit and management consultancy gave positive

feedback but advised me that at that time companies did not collect the type of information required to run such a scheme.

A senior economics representative from the party, who happened to have attended the same university college as the author, I think had not read the monograph, did not believe the policy could achieve a growth rate in excess of 1% and stuck on that point. If he had read the monograph he would have seen the methodology for the calculation.

It was clear that monetarism and supply side economics had come to dominate economic thinking as the flavour of the period filtering out just about anything that appeared to be different.

Other feedback from a senior manager from KPMG audit and management consultancy gave positive feedback but advised me that at that time (1981) companies did not collect the type of information to run such a scheme. So, my thoughts on this matter were that attention would need to be given to the information management system to facilitate this data collection.

In reality, the only person who I realised had read and understood the monograph by the nature of his questions, was Richard Wainwright the economic spokesman for the Liberal Party. He stated that he was positively impressed by the proposal and commented on the challenge of introducing and administering it. He stated,

“I we put that in our manifesto and we win, we would then be faced with the challenge of implementing it!”

At the time, he was right because at that time I had not turned my attention to this issue. Given the nature of 3P, at that time, the capabilities of information technology and communications were not really adequate to handle this job. Most companies would not have had the required information technology devices. However, in the following 44 years I addressed these issues and was greatly assisted by the revolution in information technology in the form of Structured Query Language (SQL) databases, personal computers, then laptops, Object Oriented Programming (OOP), standardised JavaScript and many other scripts, including Open Source, and the post mid 1990s explosion in online capabilities and online systems.

Today it is well within the capabilities of information technology and communications to manage 3P and the individual corporate level and level of the government administration.

The Author: Hector Wetherell McNeill



*Hector Wetherell
McNeill*

Hector Wetherell McNeill was born in Portsmouth, Hampshire and attended Friends' School Great Ayton in North Yorkshire and the Southern Grammar School in Portsmouth.

He was a member of Clare College Cambridge reading the Agricultural Tripos at the School of Agriculture and subsequently post-graduate economics at the Faculty of Economics.

He was a Fellow of the Food Research Institute at Stanford University completing economics courses at the Department of Economics and systems engineering at the Engineering School.

Soon after leaving Stanford he initiated the development work on the Real Incomes Approach to Economics in 1975 in the midst of the global stagflation crisis. He started this enquiry as soon as he realised that conventional theory and policies could not solve stagflation without imposing prejudice on business and constituents.

He has dedicated some 49 years to the development of the Real Incomes Approach to Economics and remains the main international exponent of this distinct school of economic thought.

He was the first remote sensing expert to be contracted by the Food & Agriculture Organization of the United Nations heading an all Brazilian team to design and implement the world's first fully automatic crop inventory system for coffee.

He was a Senior Scientific Officer with the Brussels based Information Technology & Telecommunications Task Force of the European Commission heading systems groups identifying promising applications developments for learning systems for several economic sectors in the European Union based on the emerging global network technologies and the Internet.

He was the environmental economist for the G7 Brazilian Rainforest Trust Fund based at the World Bank in Washington.

Hector is married and has a daughter.

A keen follower of Modern Jazz and Brazilian music and in particular Bossa Nova and its derivatives.

He is fluent in Portuguese and plays jazz harmonica

ANNEX 1

Why real incomes?

The main impact of economic policies and in particular monetary policy is on the real incomes or purchasing power of disposable incomes of constituents.

In terms of constitutional economics, it is the most important indicator of the state of the economy and wellbeing of constituents. Real incomes are the “resultant of multiple economic factors movements mainly as a result of policy.

Quite often rather than focus on real incomes, policy has focussed of individual factors such as the balance of payments by raising interest rates to “strengthen” the pound and attract deposits with negative impacts on real incomes. All parts of the interest rate cycle applied to control inflation invariably results in reductions of real incomes.

Real income	Micro-determinants	Macro-determinants
Real incomes	<ul style="list-style-type: none"> • Inflation • Taxation 	<ul style="list-style-type: none"> • Investment • Productivity • Nominal wages • Balance of payments • Unemployment • Inflation • Interest rates

In order to separate out the priority for policy actions the best indicator of policy performance is the state of real incomes. It also indicates the range, in terms of income disparity, and the drops in average real incomes associated with business disruption and failing companies resulting in wage freezing and even reduction and rising numbers of welfare payments,

Concerning the lower income segments the extent of poverty defined as where individuals cannot access basic essentials including food and abode can also be indicated by the real income measurement.

ANNEX 2

Theories of Money

Unfortunately, monetary policy is flawed because the basic Quantity Theory of Money (QTM) is wrong.

As a result, all conventional economic theory and practice is prejudicial.

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

The commonly used QTM, proposed by Irving Fisher, is as follows:

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



Fisher

Where:

M is the volume of money;
 V is the velocity of money circulation;
 P is the average price of goods & services;
 Y is the quantity of goods & services or, real income.



Keynes

John Maynard Keynes, Arthur Pigou and Alfred Marshall realized savings would reduce amount of money in circulation and they therefore produced what is known as the Cambridge Equation.

A version of this is shown below:

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



Pigou

Where: s is savings.

The paradox of quantitative easing (QE) is that based on Irving's QTM, one would have expected this to have caused the prices of goods & services to go up.



Marshall

However, at first this did not happen but real incomes, or purchasing power of wage-earners began to fall (Y).

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



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

Hector McNeill therefore, elaborated a Real Theory of Money (RTM) to ^{McNeill} replace the QTM, which includes all of the asset classes as follows:

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

Where:

- l is land;
- r is real estate houses & buildings;
- p is precious metals;
- m is commodities;
- a is rare & art objects;
- h is shares;
- f is financial instruments;
- c is crypto currencies;
- o is overseas money flows;
- s is savings.

In February 2024 McNeill added a variable to represent productivity in the form of the Price Performance Ratio (PPR) used to weight the identity variable P or average prices of goods and services/The PPR is represented by the variable “w” in the new identity below:

$$(M - (I + r + p + m + a + h + f + c + o + s)).V = (w \cdot P).Y \dots (iv)$$

Where w is the PPR weighting.

This new identity was named the **Value Theory of Money** to distinguish it from the quantity association of the QTM and to create a coherence between 3P as policy practice and a baseline theory that establishes the value of the currency or purchasing power by establishing the volume of money in the goods and services transactions domain as a result of assets, savings and overseas flow deductions and the movement in price levels as a result of productivity.

The only asset that did not exist when Fisher, Keynes, Pigou & Marshall worked on these identities was cryptocurrencies. The question therefore arises, why were the other money flows never included in assessment of the impact of money volumes on the prices of goods & services? After all, governments, Bank of England functionaries, and university economics research and teaching staff, to this day, assert that the Quantity Theory of Money is the essential tenet or explanation for monetary theory and & monetary policy decisions.

As long as monetary policy decisions have been taken for well over a century they have been justified in terms of the logic of the Quantity Theory.

It is time to abandon this flawed identity and therefore the logic of monetary policy.

McNeill, H. W., "Theories of Money", Economics Brief, No.1, 2024.

ANNEX 3

Income Disparity

The flawed Irving Fisher version of the Quantity Theory of Money (QTM) identity obscures the fact that assets absorb a large proportion of funds. This leaves a reduced residual accessible to investment, inputs and wages for the production of goods and services. This was particularly evident between 2008 and 2023 during quantitative easing (QE).

The QTM obscures this reality because it contains no variables for assets, overseas flows and savings. As a result, the QTM is far too simplistic and of no utility because it is not a determinant function.

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

Where:

M is the volume of money;

V is the velocity of money circulation;

P is the average price of goods & services;

Y is the quantity of goods & services or, real income.

I elaborated a Real Theory of Money identity (RTM) to replace the QTM, which includes all of the asset classes as follows:

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

The missing asset variables are:

l as land; r as real estate houses & buildings; p as precious metals; m as commodities; a as rare & art objects; h as shares; f as financial instruments; c as crypto currencies;

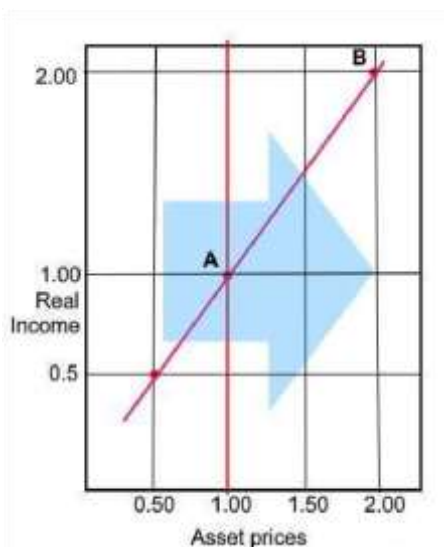
Two other significant withdrawals from national transactable money volumes include: O as overseas flows and s as savings.

Under QE, this flow was greater, has a significant impact on income disparity

Asset holders & traders

The income levels of income of assets holders and traders benefit from rapidly rising asset prices. The volume of transactions and volume of money drives asset prices higher. Because of this effect as money volumes rise so do sales margins and income of traders. In the meantime, the held assets accumulate value, raising wealth. This is illustrated in Figure 1.

Figure 1
Asset holder preference for movement of asset prices



A price rise from 1.00 to 2.00 doubles real incomes by moving from position A to point B. The blue arrow indicates the price movement preference of asset holders.

Wage-earners

In the case of wage-earners, nominal wages do not rise significantly from year to year. As shown in Figure 2, a doubling of goods and service prices will halve real incomes by moving the state of real income from A to B as a function of rising prices.

Therefore, the blue arrow indicates the price movement preference of wage-earners.

As can be appreciated asset holders and traders price movement preferences are diametrically opposed to wage-earner preferences.

The fact that in one case we refer to assets and in the second case goods and services is not a matter of comparing apples and pears.

This is because the determinant of the real incomes of asset holders and traders are the very products they trade in or hold. Therefore, their real recompense varies with movements in asset prices but as prices are rising so are their real incomes.

Similarly, the determinant of the real incomes of wage-earners are goods and services purchased for consumption but which are not resold. Therefore, their real recompense varies with movements in the prices of goods and services but as prices rise real incomes decline.

Because of the prices of the assets of land, real estate (houses, offices, commercial and industrial units) are rising there is a knock-on effect in housing markets and industrial and logistics units causing a rise in rentals and prices. This raises business costs and the cost of living for families paying rent or attempting to purchase a home. This results in family and business costs rising and a corresponding rise in the prices of goods and services production.

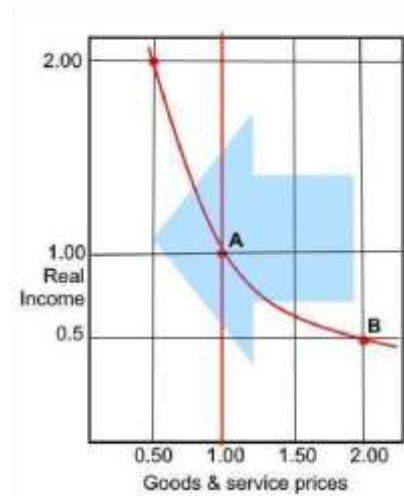
Once the inflation rate of goods and services begin to rise the real demand begins to decline because the purchasing power of wages declines. This means that there will be difficulties faced by businesses and households to pay rent so that the return on rental properties will falter and the resale market will weaken resulting in hedge funds coming onto the scene and purchasing from middle income owners, usually at a discount.

When the United Kingdom modified the macroeconomic approach to place more emphasis on monetary policy in 1975, the average house price was £10,388 and the weekly wage around £48, by 2023 the average price of a house was £258,115 and the weekly wages around £600. Over that time period wages increased by a factor of around 12.5 whereas house prices increased by a factor of around 25. Therefore, house prices and rents as a component of the cost of living of average wages contributed to a halving of the purchasing power of wages for that component. At the same time buying and selling houses and renting them remained profitable.

The Bank of England while referring to “price stability” and also relying in the logic of a defunct QTM gives the impression that the price stability it refers to is goods and services. However, the actions reflect their objective it to maintain the value of assets because these remain as collateral for banks. This is understandable. However, the way in which monetary policy has been managed has contributed to a marked rise in income disparity and poverty amongst wage-earners, and the majority of those in the lower income segments.

McNeill, H. W., *Income Disparity*, Economics Brief, No.1, 2023.

Figure 2
Wage-earner preference for goods and service prices



ANNEX 4

Anticipatory Pricing as Rational Management

The maintenance of the purchasing power of the currency is lost under conditions of inflation. The Quantity Theory of Money (QTM) identity indicates that the prices of goods and services rise as a function of volumes of money in the economy. However, the QTM lacks those variables representing assets that rise in price as a function of money volumes and which feed through into production and household costs creating cost-push inflation and a decline in corporate profits and household real incomes.

[The Value Theory of Money \(VTM\)](#) developed as part of the development of the Real Incomes Approach details the full complement of factors that influence inflation.

Maintaining returns under inflation

Combining imports with home grown input costs inflation, corporate management are faced with the problem is maintaining returns under inflationary conditions. It is necessary during any trading period to maintain the real value of the net cash flow available for procurement and purchase of next period inputs which are experiencing rising prices.

The challenge is to maintain this physical throughput and returns by raising prices sufficiently so as not to be left with a deficit and to avoid raising loans during period when interest rates are high during inflationary periods.

Anticipatory pricing

Joseph Schumpeter saw profits as the guarantee of future activity and employment. Anticipatory pricing is the practice of raising prices sufficiently under conditions of input inflation to ensure that the real value or purchasing power of cash flow and margins remain stable.

Our work established that the degree that anticipatory pricing influences inflation, in terms of the rises in output unit price, can be measured by the Price Performances Ratio (PPR). This was first identified in 1975 as an analysis of pricing decisions of companies in Brazil under inflationary conditions brought on by the OPEC petroleum price crisis initiated in 1973.

At that time the anticipatory pricing was exacerbating the state of inflation because companies were over-estimating likely cost price trajectories, risking hyperinflation.

Handling high interest rates

Under inflationary conditions, interest rates can become excessive and for short term cash requirements it is cheaper to raise unit prices so as to raise funding from cash flow to avoid raising loans.

The mechanics

In summary, anticipatory pricing tends to raise inflation which reduces consumer purchasing power. The relationships between percentage aggregate unit input costs and the percentage unit output price responses can be summarised in the Price

Performance Ratio (PPR)

$$PPR = \frac{dUP}{dAUC} \quad . \quad (i)$$

Where

dUP is the percentage unit price response to; dAUC the percentage change in aggregate unit input costs.

PPRs & Anticipatory Pricing

In terms of anticipatory pricing there are three key Price Performance Values (PPR) values:

A PPR in greater than unity (>1.00) raises profits and inflation above the input rate and this it has been referred to by some workers as “greedflation” and the purchasing power of consumers falls as do their real incomes.

A PPR of unity ($=1.00$) maintains profits and inflation remains at the input rate. Although this is often the aim of companies under competitive conditions, the natural tendency to attempt to lower risks, usually results in the PPR rising above 1.00. In this case consumer real incomes continue to decline at the rate on input inflation.

A PPR of less than unity (<1.00) results in a fall in margins but inflation falling to a level below the input rate. In this case there will be a rise in consumer purchasing power or real incomes.

PPR values, profits, inflation and consumer real incomes

PPR value	Effect on profits	Effect of output inflation	Consumer real income
>1.00	Rise	Rises	Falls
$=1.00$	Remain stable	Maintains input rate	Falling
<1.00	Fall	Falls	Rises

The effect of anticipatory pricing

Anticipatory pricing is a logical financial tactic to maintain the purchasing power of cash flow and the rate of return of a company under cost-push inflationary conditions.

The Real Incomes Approach policy of 3P a policy proposition of the Real Incomes approach to Economics is designed to change the objective of anticipatory pricing from a sole objective of maintaining profits and a zero-sum outcome to one of positive systemic consistency of reciprocal benefits in transactions for both companies and consumers.

McNeill, H. W., "Anticipatory pricing as rational management", Economics Brief, No.1, 2023.

ANNEX 5

Accountancy & Taxation

Corporate accounts prepared to determine tax liabilities classify labour as an input cost category while the general incentives of management is to maximise profits while minimising costs. Where there are external shareholders the competition for equity places an emphasis on so-called shareholder value.

As a result, in terms of prioritization, profits and executive bonuses tend to take precedence over wage adjustments. Even where there are wage adjustment clauses the CPI and CPIH estimates are usually underestimates of the actual level of household expenditure inflation leading to a decline in real incomes over time.

Extract: McNeill H. W., "Paradox series", Real Incomes Approach to Economics, 2000.

ANNEX 6 "Prices & consumption"

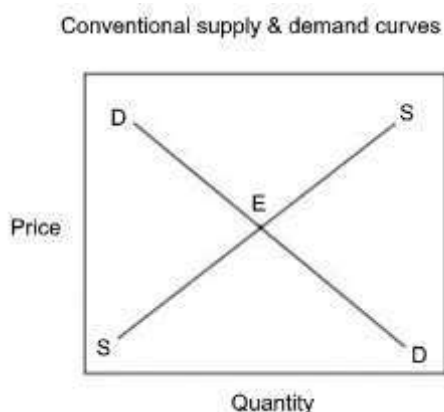
The response of consumers to price reductions in goods and services is measured by the **income-price elasticity of consumption** or demand (ipEc). This is defined as the percentage change in consumption associated with a one percentage point reduction in the product price.

Usually, the ipEc is positive, indicating that price reductions result in a rise in consumption and sales. However, the ipEc also depends on the disposable income of the consumers so that the ipEc varies with each income segment.

This is because in lower income segments some products are considered to be out of reach because the current price causes other products within the real income envelope of these consumers to be preferable. However, a reduction in price might result in purchases of this product either to add to the existing products or by substituting them.

A higher income consumer already using the product in question might simply purchase more as a result of price reductions.

The representation of supply and demand



One of the problems with understanding the significance of the ipEc is the common use of a supply and demand diagram (see left) which obscures just how complex the issue of prices and consumption is by hiding the essential impact of the differences in disposable incomes on sales volumes and what is and what is not an accessible price according to people's disposable income and other products in their "basket".

The solution to this is the Production, Accessibility & Consumption representation which admits to a range of ipEc values across disposable incomes. More detail on this can be found in ["Monetarism & The Cost of Living", British Strategic Review, Special Edition,](#)

ANNEX 7 PPL Schedules

Examples of Price Performance Levies

The Real Incomes Approach provides for a very large range of options for applying PPLs to aggregate incomes according to the PPR. Below two types are discussed. The basic calculation of PPLs is to apply a corrective coefficient based on the PPR value to a Basic Levy expressed as a percentage e.g. 20%.

PPL Power functions - intensifications

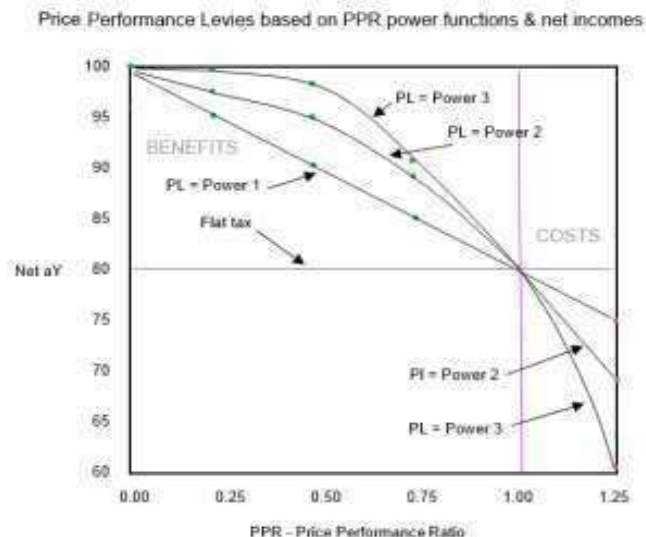
When policy makers wish to change the intensity of size of the incentive to lower PPRs a power function can be used to calculate the PPL coefficient. Thus, the table below shows the effect of different PPR power functions on the size of the Levy to be applied to operational margins with a basic levy of 20%:

Table: Some PPL power functions applied to a basic levy of 20%.

Some PPL power functions applied to a basic levy of 20%
 The percentages indicate the levy to be paid according to the respective PPR
 For comparison a conventional tax or flat tax can be assumed to be 20%

PPR	PPR power function					
	PPR ¹		PPR ²		PPR ³	
	PPL%	net aY%	PPL%	net aY%	PPL%	net aY%
0.00	0.00%	100.00%	0.00%	100.00%	0.00%	100.00%
0.25	5.00%	95.00%	1.25%	98.75%	0.31%	99.69%
0.50	10.00%	90.00%	5.00%	95.00%	2.50%	97.50%
0.75	15.00%	85.00%	11.25%	88.75%	8.44%	91.56%
1.00	20.00%	80.00%	20.00%	80.00%	20.00%	80.00%
1.25	25.00%	75.00%	31.25%	68.75%	39.06%	60.94%

Key:	Benefit	Flat tax	Prejudice
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PPL slide functions - linear reductions or augmentations

Slide functions simply add or deduct from the basic levy value in proportion to the PPR achieved.

The examples below show a basic levy of 20% weighted up or down by 0.25 to generate the PPL value.

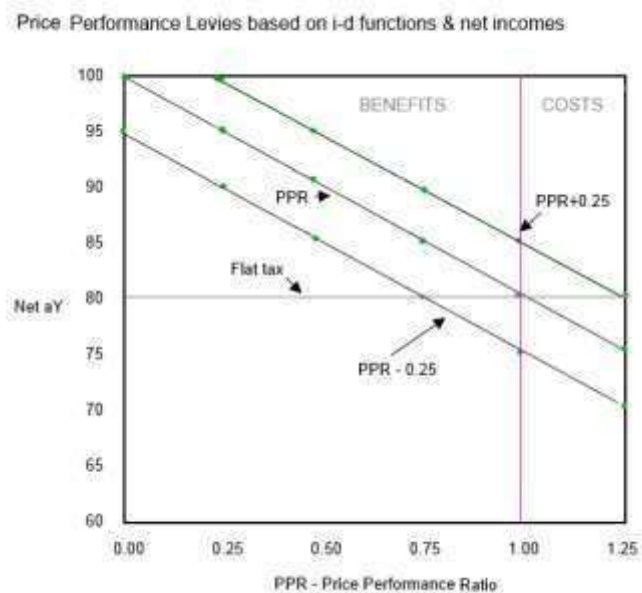
Table: of performance levies based on slide function

*Some i-d functions applied to a basic levy of 20%
The percentages indicate the levy to be paid according to the respective PPR
For comparison a conventional tax or flat tax can be assumed to be 20%*

PPR	PPR i-c function					
	PPR+0.25		PPR		PPR-0.25	
PPR	PPL%	net aY%	PPL%	net aY%	PPL%	net aY%
0.00	5.00%	95.00%	0.00%	100.00%	0.00%	100.00%
0.25	10.00%	90.00%	5.00%	95.00%	0.00%	100.00%
0.50	15.00%	85.00%	5.00%	95.00%	5.00%	95.00%
0.75	20.00%	80.00%	15.00%	85.00%	10.00%	90.00%
1.00	25.00%	75.00%	20.00%	80.00%	15.00%	85.00%
1.25	30.00%	70.00%	25.00%	75.00%	20.00%	80.00%

Key:	Benefit	Flat tax	Prejudice
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Figure: Graph of performance levies based on slide function



A Note on conventional and flat taxes¹³

In order to provide a comparison of the relative impacts of Price Performance Levy formulae and conventional and flat taxes one can assume in the above tables that the flat tax is where the PPR values are ignored and the tax remains at 20%. The Real Incomes Approach sets out to compensate companies for their contribution to real incomes whereas flat taxes and conventional taxes are neutral to performance and pay no attention to the contribution of the company to the increase in real incomes. Accordingly, irrespective of the performance of a company the tax rate remains the same. Thus, a company undergoing significant growth in nominal terms and generating a high return and profits might also be operating in a non-competitive fashion and in fact be a generator of inflation and contributing to the reduction in real incomes. This company will, under a flat tax regime pay the same tax rate as a company investing and achieving higher performance in terms of contribution to real incomes.

Under a Price Performance Policy, the benefits accruing to companies who contribute to real incomes levels can be observed in the tables above and the accompanying graphs. Under the flat tax the net of tax is the remaining 80% of income. In the case of RIP net of tax income can vary from 80%-100% of gross income, that is levies of between 0% and 20% for PPRs below unity (<1.00).

Where the PPR is greater than unity (>1.00) the flat tax remains the same with a net income of 80% of gross but under RIP the levy becomes a surcharge leaving, in the examples above, net incomes of 61% to 80%.

The price-setting objectives under RIP encourages companies to set prices in order to pay a PPL at a rate tending towards or attaining zero (0%).

Innovation policy

Beyond the confines of a RIP framework environment geared to the promotion of price and physical productivity to eliminate and avoid future stagflation, there remains the more general question of national innovation policies. On this question, the data on the performance of industries and manufacturing in relation to PPRs provides a map of where specific sectors are achieving a relatively easy attainment of price and physical productivity. For example, this would be the case in information and communications technologies (ICT), largely as a result of the effect of Moore's Law¹⁴.

Being able to identify those sectors and their associated technologies facing difficulties in advancing price and physical productivity is a useful basis for identifying where, in a process system, improvements are required, as a guide to supportive measures.

¹³ Under RIP where the PPL is deployed there is in fact no corporate taxation so the comparisons with conventional and flat taxes does not really compare equivalent situations but the advantage of RIP is evident. All revenues under RIP would normally come from personal taxation requiring, of course, reasonable rates of pay for employees made feasible by the more efficient allocation of resources and real income generation.

¹⁴ Moore's Law: In 1965, Gordon Moore predicted that based on the evolution in the etching technologies involved, that the number of distinct logical elements able to be placed on an integrated circuit board would double each year. This turned out to be right. The significance of this is that ICT devices became more powerful, smaller size, consumed less energy and fell in unit price. Ref: Moore, G. E., "Cramming more components onto integrated circuits", Electronics, Volume 38, Number 8, April 19,

The figure below shows a PPR map as the coordinates of the full range of possible unit price responses to different changes in aggregate unit costs.

PPR map associating unit input cost changes to unit output price changes

*Price Performance Ratios (PPRs)
associated with different unit input value movements & movements in unit output prices*

Unit input costs	Unit output price change %										
change %	-20	-15	-10	-5	0	5	10	15	20		
20	This area represents the innovation target zone				0.00	0.25	0.50	0.75	1.00		
15					0.00	0.33	0.66	1.00			
10					0.00	0.50	1.00				
5					0.00	1.00					
0	0.00	0.00	0.00	0.00	0.00						
-5	0.25	0.33	0.50	1.00							
-10	0.50	0.66	1.00								
-15	0.75	1.00									
-20	1.00										

Innovation target zone Desirable states Undesirable states

The policy objective and the interests on companies and workforces is to move performance upwards and to the left. An innovation zone coloured in green indicates a target zone and companies, depending upon the processes they apply will have varying capabilities to move in that direction. This knowledge can provide data for a more strategic approach to solutions linked to state-of-the-art systems and the range of feasible adaptations. Such an exercise can also identify gaps in basic knowledge or analysis on those specific systems components required to develop improved systems.

This can help provide guidance to prioritize the provision of funding on a range of applied developments, as well as basic research provided by the private sector or government. Such data can also provide quantitative data on the potential financial benefits of specific improvements in the operation of state-of the-art processes. This data gathering and analytical process cannot be accomplished without the full involvement of sector sub-domains grouped according to their basic process technologies, e.g. digital electronics, materials

e.g. metallic or products, e.g. machine tools. Each sub-sector should collect performance data from within their memberships to create benchmarks for high, average and low performance so as to provide average or low performers with demonstrably feasible targets for improving their performance. A process extension

or advisory service¹⁵ can support data collection and analysis as well as the diagnostics of why certain processes are low or only average performers as a foundation for continual learning within sectors and spelling out pathways to higher performance.

McNeill, H. W., "PPL" Real Incomes Approach to Economics, 1995

ANNEX 8 Tacit knowledge & explicit knowledge

Tacit & explicit knowledge

The Real Incomes Approach is designed to encourage a sustained effort in increasing the productivity of economic activities as the driver of growth in real incomes.

An important aspect of achieving this is the optimization of the combinations of tacit and explicit knowledge. This is a vital topic that is quite often not addressed in discussions concerning macroeconomics or policies directed by encouraging increases in productivity in economic units

Understanding resource inputs

Tacit Knowledge - the knowledge and information embedded in people²

The bounds of production performance feasibility are normally set by the known capabilities or performance of the people working in a defined process and deploying defined techniques in the use of specified tools and equipment. There is a trade-off between innate capabilities of people (***tacit knowledge***) which can be quantified in terms of practical performance related to the accumulated capabilities and knowledge derived from direct experience and embedded in people.

Tacit knowledge is attained through experience in exercising given techniques in a specific task on a repetitive basis and it can be roughly measured in terms of the time a person takes to complete a specific task. This means, for example, that a person with 6 months experience will not have the same performance in carrying out a somewhat complex activity as someone with 15 years practice. All business operations need to contend with the reality that a specific level of human operational attainment might be desirable but often people with sufficient experience are not available so it is necessary to make use of less experienced people for them to learn on the job and gradually improve their performance.

These are realities and managers who learn to work and apply this knowledge can not only identify feasible quantitative operational targets but can also project the likely future profile of performance on an objective basis.

¹⁵ The basic model for this is the agricultural extension services that provide advice to farmers on how to improve productivity by applying the latest knowledge on the determinants of performance.

Tools & equipment

Automation - knowledge & information embedded in tools & equipment

Besides the trade-off between experience and performance there is also a trade-off between the tools and equipment used and the degree to which they support work through automation (digitization) so a machine tool with considerable knowledge & information embedded in the tools & equipment, including programs and electromechanical or electro-graphical components, will be more advanced and productive than ones with less automation components.

Feasible productive solutions

Feasible solutions arise from the combination of people, tools and equipment according to practical quantified attainments based on observation and measurement performance associated with the normal ranges of attained performance. These can be ranked as low average or high performance or be benchmarked in terms poor, average or good practice.

Explicit Knowledge – knowledge in general and the knowledge generated by activities.

Management of activities

General knowledge

The understanding and management of activities benefits from people's domain knowledge and experience. A guide indication of this experience is formal instruction in the domain or a related topic.

Orientation of decisions

People manage activities in terms of instructions that define the final product, set out what needs to be done, its timing and sequencing according to the specific requirements at any given point of time and these are communicated through spoken and written instructions expressed in the form of **explicit knowledge** & information.

Explicit knowledge, unlike tacit knowledge, can be easily transmitted to another person within a relatively short period of time..

Explicit information communications infrastructures

Supportive resources for the storage, access and communication of explicit knowledge include information technologies and telecommunications including the World Wide Web and the Internet.

Decision analysis

The ability to make sound business decisions depends upon knowledge of cause and effect relationships (determinant functions), upon knowledge concerning the probability of events influencing decision outcomes and on the ability to identify, collect and analyse additional information to refine the understanding and relevance of the

determinant functions and estimate probabilities. In this decision analysis process the vast range of resources that exist in the form of mathematical procedures, rules, logic and methodological elaborations in the form of statistical survey and analysis and operations research algorithms represent effective ways to apply explicit knowledge. Even the actual performance levels achieved by people with different levels of accumulated capabilities, or tacit knowledge, are expressed in the form of explicit knowledge for recording, accessing, transmitting, analytical and planning purposes.

Artificial intelligence and automation

The terms tacit and explicit knowledge became more evident during the 1980s when efforts were being made to advance 5th Generation computing, also referred to as artificial intelligence (AI). Whereas data processing involving explicit knowledge can be accomplished far more effectively with digital processes than human effort, when it comes to tacit knowledge, the automation processes face a significant challenge in being able to emulate the human characteristic of the learning curve process based on direct experience. There is also a problem in writing code that can combine the three properties of the effective human element described in three lines of Lawrence Henderson in a box at the end of this ANNEX stating Elton Mayo's early description of tacit knowledge:

“the effective practitioner must have:

- *first, intimate, habitual, intuitive familiarity with things •*
secondly, a systematic knowledge of things and
- *thirdly, an effective way of observing things (objects, processes and events) and analysing them so as to arrive at conclusions through a process of deduction”*

Notice that the third process is advanced on the basis of experience from the first (tacit knowledge) and learning acquired to build up the second (explicit knowledge).

George Boole

In a book entitled, "The Laws of Thought", published in 1854, George Boole described how humans deduce and make decisions. He also set this out as a practical mathematics of logic and probabilities. This work provided the rationale and methodology for reducing complex logical relationships to simpler sets of relationships which can reproduce all of the possible relationships from which the set was derived. This process is known as Boolean reduction. Boolean reduction is used to reduce the size and complexity of complex digital logic designs to produce workable logic designs for circuits for digital devices. The success of modern digital circuitry manufacturing, including micro-devices and the computer industry based upon these, rests directly upon the practical utility of the mathematics developed by George Boole.

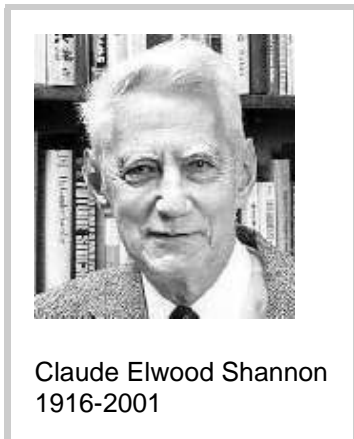
George Boole's objective in developing this approach to logic was to explain how individuals use information and knowledge to deduce and take decisions. He succeeded in establishing, some 150 years ago, a practical basis for designing expert and knowledge based systems.



George Boole
1815-1864

Boolean Logic in the Digital World

The essential contribution of Claude Shannon



Claude Elwood Shannon
1916-2001

There is no doubt that the person who was instrumental in pointing out the importance of Boole's mathematical logic to digital systems, was Claude Shannon. He was born in Petoskey, Michigan, USA in 1916. He graduated from the University of Michigan in 1936 in mathematics and electrical engineering. In 1940 he gained a masters in electrical engineering and a Ph.D. in mathematics at MIT. Claude Shannon died in 2001.

Although broadly appreciated for its brilliance, Boole's work had found limited practical application. However, in

1938 Claude Shannon published a paper, based on his 1937 thesis, entitled, "*A Symbolic Analysis of Relay and Switching Circuits*" where he explained how Boolean Logic could contribute to a more efficient circuit design. This seminal work launched Boolean logic into the digital world.

It is intriguing how the personal abilities of Shannon were such that, with the combined expertise of electrical engineering and mathematics and having studied Boolean Logic as an undergraduate, he was able to correctly identify the contextual significance of Boolean Logic. In doing so he made a vital contribution to the efficiency of circuit design based on Boolean logic and accelerated the world's entry into the digital era as we know it today.

An interesting paper entitled "*1+1=1 a tale of genius*" was written by Ian Petticrew who was the editor of the INTOSAI Magazine which is hosted on the web site of the National Audit Office (INTOSAI - International Organization of Supreme Audit Institutions) and describes in more detail the linkage between George Boole's and Claude Shannon's work. This paper, from Issue 18, August 2003 of the INTOSAI IT Journal, is available in pdf format and can be accessed on this link:

["1+1=1 - a tale of genius"](#)

Source: [The George Boole Foundation](#) website.

This constellation of linked logical activities represents the complex that any attempt at automation or embedding in a coherent code with an adequate feedback and response to learning cycles needs to contend.

In the 1980s there was a significant effort in Europe and the USA to compete with the Japanese initiatives in artificial intelligence following the release of the ICOT report that was produced in the early 1980s. Between 1983 through 1987 The author was involved in the identification of novel applications and their impacts on the European economy (PROGNOS-GTS) and then with the Information Technology Telecommunications Task Force (ITTTF) of the European Commission in Brussels identifying planning initiatives for the development of learning systems.

As a result of this work there was an increasing awareness of parallel efforts in the USA, European member States and Japan including those of the European Strategic Programme in Information Technology (ESPRIT). However, as far as the author was concerned just four facts emerged from this period of the mid-1980s through mid-1990s and which could be classified as practical successes, these were:

- the introduction of technical operational standards by the European Commission and Telecom industry for the mobile telephony industry and market which helped the EU overtake the USA and Japan in this field
- the development of the World Wide Web following the almost individual efforts of Tim Berners-Lee while working initially on a short term contract with CERN
- the development of industrial process robots accelerated and was largely perfected during this period, largely in Japan
- the major change in the programming paradigm to object oriented approach based largely on the efforts of Ole-Johan Dahl and Kristen Nygaard of the Norwegian Computing Center in Oslo since the 1960s starting with their program Simula 1.

These more "mundane" developments had a far more profound, practical, economic and social impact but they did not emerge from the efforts supported by Euro billions spent on research programmes and AI.

In reality there was little output that took us beyond the basic binary logic (Boolean Logic) based on the mathematical deductive logic developed by George Boole and set out in his work entitled, *"The Laws of Thought"*, published in 1854, in which he described how humans deduce and make decisions. Much of the more recent "advances in AI including verbal responses to questions, quiz systems and so-called evolutionary algorithms and complex simulations can be explained in terms of Boolean logic.

Moore's Law

What has been apparent has been the continuing impact of Moore's Law¹⁶ in information technology. This is based on an observation made by Gordon Moore, one of the cofounders of Intel, which was that the number of transistors in a dense integrated circuit doubles approximately every two years. Although Moore's observation was made in 1965 this relationship seems to have endured, although the 2 year cycle has been reduced to 18 months. This law has been used in the semiconductor industry as a guide to medium to long term planning basing projected

¹⁶ Moore, Gordon E. "Cramming more components onto integrated circuits" Electronics Magazine, 1965

performance and targets for research and development efforts. Moore's law is an important indication of the intensity of technological and social change, productivity, and economic growth.

Management decision analysis

Knowledge on tacit and explicit knowledge can be used to improve management decision-making so as to increase real incomes within a Real Incomes Policy framework and thereby contribute to a general rise in real growth in the economy as a whole. The initial step is to understand that tacit knowledge is an evolutionary process that occurs over time and that the actual contribution of tacit knowledge can be measured over time to determine the contribution of tacit knowledge to any current state of performance. In addition, the understanding of the learning curve relationships that trace the effect of tacit knowledge on productivity can be used to project likely costs of operations into the future.

Wright's Law

The economic impact of the combination of applied tacit and explicit knowledge was explained in the form of the effect of the learning curve. This was explained by Theodore Wright in a paper¹⁷ in 1936. The learning curve impact described by Wright has also been referred to as Wright's Law and has turned out to be a reliable basis for predicting the impact of tacit knowledge on the productivity of processes involving humans and in addition can be used to extend this analysis (see the box on the left).

Learning curve

The learning curve is the phenomenon of the occurrence of measurable reductions in the resources used (including time) in the production of an object in association with the cumulative quantity of throughput. In general terms there is for many production situations a constant reduction in resources used measured in a percentage drop in resource consumption (learning index) associated with every doubling of historic cumulative production by a team or individual.

Belkaoui¹⁸ cites a summary by Hirschmann¹⁹ of the basic doctrine of the learning curve as:

- 1. Where there is life there is learning*
- 2. The more complex the life, the greater the rate of learning. Man-paced operations are more susceptible to learning or can give greater rates of progress than machine paced operations.*

¹⁷ Wright, T., "Factors Affecting the Cost of Airplanes" (Journal of Aeronautical Science, Volume 3, No.2, 1936, pp. 122-128).

¹⁸ Belkaoui, A., "The Learning Curve - A Management Accounting Tool", Quorum Books, 1986.

¹⁹ Hirschmann, w. B., "Learning Curve", Chemical Engineering, (Volume 71, No. 7,1964) pp 95-100.

3. *The rate of learning can be sufficiently regular to be predictive.*

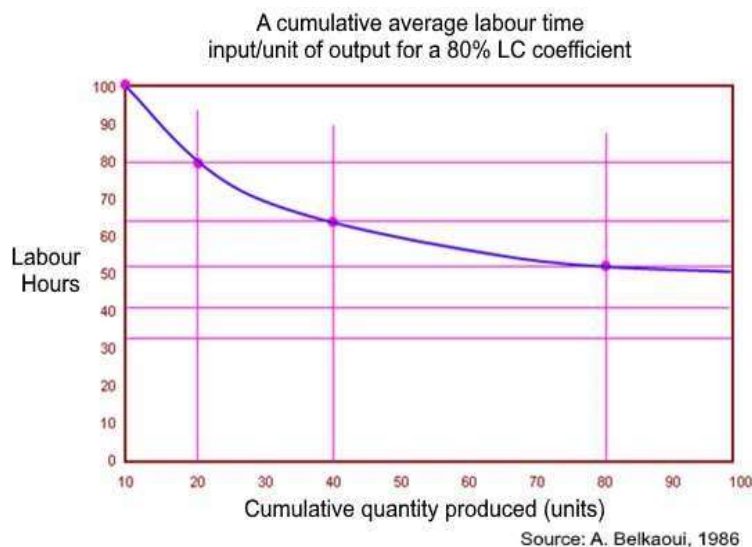
Operations can develop trends which are characteristics of themselves.

Projecting such established trends is more valid than assuming a level or performance or no learning.

In general terms the learning curve effect is more pronounced if production processes are labour-intensive and less pronounced if production processes are more capital-intensive or automated.

Geometry of the learning curve

The learning index is the percentage reduction in resources used with each historic doubling of throughput. This is also expressed as a percentage curve thus more capital intensive processes might have a 90% curve signifying 10% reductions and a more labour-intensive process might have an 80% curve indicating a 20% reduction. An example of an 80% curve is shown below.



Real Incomes and Costs

As a result of our understanding of Wright's Law there is a degree of predictability in technological innovation and this has profound implications.

Not least such knowledge provides a significant advance over conventional economic theories enabling a more rational theory on economic growth. More significantly this makes possible a more transparent alignment between public policies designed to support investment as well as the microeconomic imperatives of good systems and engineering design, investment implementation and the operations of economic units.

This is one of the main objectives of the Real Incomes Approach to economics. The researchers mentioned in the section entitled "*Wright's & Moore's laws compared*" below explained that technological performance cannot be quantified by a single

measure because technologies have several components. For example, a computer has speed, memory size, disc capacity, size and a cost (or price).

However, by using the inflation-adjusted cost of one “unit” it was possible to compare many different technologies even although the specifications (qualities) of units were very different and also might change over time. The researchers made use of such a cost model to undertake their comparative analysis of the technology prediction models. Even although unit cost is a crude measure it is the best there is and the researchers found that common trends were detectable which were found to be predictable and useful.

This is the same rationale for the use of the Price Performance Ratio (PPR), which measures the response of unit output prices to input unit costs, as a key practical measure of performance in the Real Incomes Approach. The use of the attainment of PPR values by companies as the determinant of bonuses for performance paid through the Price Performance Levy (PPL) is therefore applicable to all sectors of the economy and status of economic units. This underlying measure is the foundation of the general status and trends in real incomes.

Driving productivity and competitive pricing

The tendency for Price Performance Policy to encourage lower unit prices has the benefit of raising consumption as a result of the price elasticity of consumption. This results in production throughput increasing and as a result the time lapses to achieve higher levels of cumulative production are reduced thereby increasing the impact of the learning curve. This in turn results in lower costs of production and lower feasible unit output prices. The setting of unit prices will depend upon the price elasticity of consumption. Because the PPR can be reduced through incremental rises in investment in technology and human resources, then innovation-driving investment is encouraged

The Production, Accessibility & Consumption (PAC) Model of the Economy

The general result, in terms of economic growth, productivity trends and real incomes can be explained transparently by the Production, Accessibility & Consumption Model of the Economy as opposed to the inexact and wanting Aggregate Demand Model (ADM) that is applied as the foundation for conventional economic theory and policy practice.

Wright's & Moore's laws compared

Forecasting technological progress is vital importance to systems engineering economists, to policy makers and investors. There are several models for predicting technological improvements including the early hypothesis made by Theodore Wright in 1936 is that cost decreases as a power law of cumulative production. Moore's law is another “law” which states that technologies improve exponentially with time. Other models have been proposed by Goddard, Sinclair et al., and Nordhaus. Six of these predictive models were tested and compared making use of a database on the cost

and production of involving 62 different technologies, to predict future costs. This involved hindcasting and developing a statistical model to rank the performance of the postulated laws. The results were published in the paper, "*Statistical Basis for Predicting Technological Progress*" (2012)

Wright's Law wins

Wright's law produced the best forecasts, but Moore's law is not far behind. The researchers discovered a previously unobserved regularity that production tends to increase exponentially. A combination of an exponential decrease in cost and an exponential increase in production would make Moore's law and Wright's law indistinguishable. However, the researchers showed for the first time that these regularities are observed in data to such a degree that the performance of these two laws is nearly equivalent. Most significantly the results show that technological progress is forecastable. These results are important for theories of technological change, and assessments of candidate technologies and economic growth policies.

Bela Nagy, J. Doayne Farmer, Quan M. Bui and Jessika E Trancik, "*Statistical Basis for Predicting Technological Progress*", 2012, Santa Fe Institute, 1399 Hyde Park Road, Santa Fe, NM 87501, USA, St. John's College, 1160 Camino Cruz Blanca, Santa Fe, NM, 87505, USA and Engineering Systems Division, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA

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An early note by Elton Mayo on tacit knowledge

Elton Mayo (1880–1949) was a psychologist who carried our research on industrial activities from the standpoint of human interactions and organization. In the year when he died a book was published entitled, *"The Social Problems of an Industrial Civilization"* containing some of Elton's work and edited by Karl Mannheim (The series: *The International Library of Sociology and Social Reconstruction*, Routledge & Kegan Paul Ltd., London, 148 pp. 1949).

Elton's writing was detailed and covered an immense field of research often referring work undertaken by others, sometimes some years back, but which had not yet been translated into English/

He was aware of the importance of what is now referred to as tacit and explicit knowledge and the box on the right covers his introduction to these issues and his justification as to why they were (are) important.

Elton Mayo on this important niche

"A simple distinction made by William James in 1890 has all the significance now that it had then; one can only suppose that its very simplicity has led the universities to brush it aside as obvious, which is true, or as of small account, which is not true. James pointed out that almost every civilized language except English has two commonplace words for knowledge-connaitre and savoir - knowledge-of-acquaintance and knowledge-about. This distinction, simple as it is, nevertheless is exceedingly important; knowledge-of-acquaintance comes from direct experience of fact and situation, knowledge-about is the product of reflective and abstract thinking."

"Knowledge derived from experience is hard to transmit, except by example, imitation, and trial and error, whereas erudition (knowledge-about) is easily put into symbols-words, graphs, maps. Now this means that skills, although transmissible to other persons, are only slowly so and are never truly articulate. Erudition is highly articulate and can be not only readily transmitted but can be accumulated and preserved. The very fact that erudition (logic and systematic knowledge) can be so easily transmitted to others tends to prejudice university instruction in the social sciences heavily in its favour."

"Physics, chemistry, physiology have learned that far more than this must be given to a student. They have therefore developed laboratories in which students may acquire manipulative skill and be judged competent in terms of actual performance. In such studies the student is required to relate his-logical knowledge-about to his own direct acquaintance with the facts, his own capacity for skilled and manipulative performance. James's distinction between the two kinds of knowledge implies that a well-balanced person needs, within limits, technical dexterity in, handling things, and social dexterity in handling people; these are both derived from knowledge-of acquaintance. In addition to this, he must have developed clinical or practical knowledge which, enables him to assess a whole situation at a glance. He also needs, if he is to be a scientist, logical knowledge which is analytical, abstract, systematic-in a word, the erudition of which Dr Alan Gregg speaks; but it must be an erudition which derives from and relates itself to the observed facts of the student's special studies".

"Speaking historically, I think it can be asserted that a science, has generally come into being as a product of well-developed technical skill in a given area of activity. Someone, some skilled worker, has in a reflective moment attempted to make explicit the assumptions that

are implicit in the skill itself. This marks the beginning of logico-experimental method. The assumptions once made explicit can be logically developed; the development leads to experimental changes of practice and so to the beginning of a science. The point to be remarked is that scientific abstractions are not drawn from thin air or uncontrolled reflection: they are from the beginning rooted deeply in a pre-existent skill. At this point, a comment taken from the lectures of a colleague, the late Lawrence Henderson, eminent in chemistry' seems apposite:

“In the complex business of living, as in medicine, both theory and practice are necessary conditions-of understanding, and the method of Hippocrates is the only method that has ever succeeded widely and generally. In the first element of that method is hard, persistent, intelligent, responsible, unremitting labour in the sick room, not in the library: the complete adaptation of the doctor to his task, an adaptation that is far from being merely intellectual. The second element of that method is accurate observation of things and events, selection, guided by judgement born of familiarity and experience, of the salient and recurrent phenomena, and their classification and methodological exploitation. The third element of that method is the judicious construction of a theory - not a philosophical theory, nor a grand effort of the imagination, nor a quasi-religious dogma, but a modest pedestrian affair . . . a useful walking-stick to help on the way. . . . All this may be summed up in a word:

*The physician must have
first, intimate, habitual, intuitive familiarity with
things;
secondly, systematic knowledge of things; and
thirdly, an effective way of thinking about
things.”*

Reference: Mayo, E., *"The Social Problems of an Industrial Civilization"*, Routledge & Kegan Paul Ltd., London, 148pp. 1949

ANNEX 9 Technology, technique & real incomes

The Say Model (Jean-Baptiste Say) considers the economy to gravitate to a dynamic equilibrium between supply side production of goods, services and capital goods and this process affording wages that, in sum, constituted consumption or demand. Say also made clear the importance of entrepreneurs in organizing the transactions and running the different sectors to adjust to imbalances through the introduction of more efficient ways to accomplish tasks or innovation. This is why any equilibriums are temporary and dynamic in nature as a response to a constant evolution in technologies and techniques as also suggested by Joseph Schumpeter in his concept of “*creative destruction*”.

This section expands more on this role to explain why in the panic surrounding events linked to money management, causing wild speculation before 1929 and hoarding of money and saving in the 1930s, caused a breakdown in the Say Model. As emphasised elsewhere this failure was caused by poor money management exacerbated by the irresponsible behaviour of most governments in a race to the bottom to maintain competitive status through devaluations.

It is worth noting that the normal way of managing the economy under the gold standard, and before Bretton Woods, was to raise international competitiveness by imposing lower wages. Naturally this would lower domestic demand generated from wages and make lower exchange-rate-adjusted priced domestic output more attractive to foreign buyers. This routinely cavalier way of managing the incomes of the majority of the population was the result monetary policy, as macroeconomic management policy, being completely divorced from essential concepts of notions of supply side production efficiency. The role of economic management on the supply side having a central role in protecting the wellbeing of the majority had been eroded by the dominance of monetary policy decision priorities. We are describing here conditions during a period when many countries were only just transitioning to a state of universal suffrage; the working population had no real means of influencing policy decisions.

John Maynard Keynes was frustrated with the then mainstream economic theory as taught at Cambridge University because it was incapable of explaining the persistence of the slump afflicting Britain, the USA and other countries. In his solution, which he considered to be a new economic theory, published in 1936 as, "*The General Theory of Employment, Interest and Money*", it was evident that he had not included much concerning entrepreneurship or technological means of reducing costs; in reality he had an overriding desire to propose something to reduce main challenge of high unemployment through managing what he understood, money.

Technology and techniques

It so happens that in the same year as the publication of Keynes' General Theory, Theodore Wright²⁰ published a paper that described the learning curve. This gave rise to generic law which evolved into a reliable framework for forecasting cost declines as a function of cumulative production. More specifically Wright's Law is a reliable basis for predicting the impact of tacit knowledge on the productivity of processes involving human learning. It can be used to extend this analysis to plan savings from current production to invest in better production techniques leading to moderated or even lower unit prices. This can result in a rise in the purchasing power of wages, in many cases it can also result in rises in nominal wages.

Keynesianism as a technological desert

The General Theory had been written before Wright's publication but even without this, Keynesianism makes no substantive reference nor provides any central function for learning and technological productivity in lowering prices and raising real incomes and wages.

Keynesianism ignores the central role of productivity in avoiding slumps and maintaining consumption and demand at equilibrium levels. As a result, Keynesianism as a whole is devoid of any structural motivations or incentives that help guide the behaviour of economic units towards greater competitiveness to raise consumption and demand through adjustments in productivity and wage levels to maintain the levels of

²⁰ Wright, T., "*Factors Affecting the Cost of Airplanes*", Journal of Aeronautical Science, Volume 3, No.2, pp. 122-128, 1936.

aggregate consumption or demand as a contemporary dynamic equilibrium Say Model.

Today we struggle with Keynesianism as the mainstream conventional economic theory being taught in universities worldwide as being in a serious need of qualification.

The contribution of learning & innovation to economic growth

John Maynard Keynes died in 1946 in a period when seminal work had been or was about to be published on the central role of learning. It is now well understood that something like 80% of all real economic growth is the result of learning along the lines of Wright's learning curve analysis which increases the competence of individuals who build up skills or internalised tacit knowledge. The analysis of these processes in the form of observation and data build up easily recorded, communicated and understood information in the form of explicit knowledge²¹. Such information is the basis of decision analysis used to identify better ways to achieve objectives and refine processes in a process of innovation. Technology²²²³ provided the leading edge of productivity and real economic growth²⁴.

Moore's law

In 1965, Gordon E. Moore predicted a steady rate in the increase of the increasing capabilities of placing more logical circuits onto a given area of integrated circuits known as Moore's law²⁵ has revolutionised modern digital technologies by lowering the costs and raising the processing power of digital capabilities on a constant basis.

In 2012 Wright's Law and Moore's law were compared²⁶²⁷ to determine which provided the most reliable projections of performance. Most significantly, the results show that technological progress is forecastable and linked to this are reliable cost projections. These results are important for theories of technological change, and assessments of candidate technologies and economic growth policies.

The encouraging aspect of this analysis was that Wright's Law, which is more generally applicable to all economic sectors, was marginally better than Moore's Law which is exclusively linked to digital systems.

²¹ Arrow, K. J., "The economic implications of learning by doing". The Review of Economic Studies. Oxford Journals. 29 (3): 155–73, 1962.

²² Solow, R. M., "Technical change and the aggregate production function". Review of Economics and Statistics. ²³ (3): 312–20, 1957.

²⁴ Kaldor, N., "A Model of Economic Growth", The Economic Journal, Volume 67, Issue 268, Pages 591–624, 1957.

²⁵ Moore, G. E., "Cramming more components onto integrated circuits", Electronics, Volume 38, Number 8, April 19, 1965

²⁶ Nagy, B., J. Farmer, J. D., Bui, Q. M., Trancik, J. E., "Statistical Basis for Predicting Technological Progress",

²⁷ , Santa Fe Institute, St. John's College, and Engineering Systems Division, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA. 2012

Monetarism as a technological desert

The initiation of slumpflation in 1975, had been caused by a severe case of cost-push inflation linked to rapid rises in the international price of petroleum. In spite of the fact the copious evidence of the role of learning and technological innovation was well established by 1970, the silo nature of academia resulted in none of these factors being embedded into monetary theory. No effort was made by leading monetarists such as Milton Friedman, to incorporate the core significance of this knowledge into monetary theory.

Very clearly the solution to slumpflation was wholly a question of substitution of petroleum and the acceleration of transitions to alternative forms of energy in line with the findings of the report, "The Limits of Growth" published in 1975 by the Club of Rome. More relevant policy making at that time is likely to have landed the planet in a far more sustainable state of affairs than we now find ourselves under the current circumstances.

The advent of slumpflation, however, resulted in many believing the inability of Keynesianism to solve this problem meant that more emphasis should be given to monetarism to "solve the issue" when there was absolutely no evidence to support this contention. The acceptance of monetarism was based on no more than assertions made by academics such as Milton Friedman.

In spite of monetarism's parallel inability to control the causes of slumpflation, even today monetarism makes no substantive reference nor provides any central function for technological productivity in lowering prices and raising real income and wages. This is because it ignores the central role of productivity in avoiding slumps and maintaining consumption and demand at equilibrium levels. Like Keynesianism, monetarism is devoid of any structural motivations or incentives that help guide the behaviour of economic units towards greater competitiveness to raise consumption and demand through adjustments in productivity and wage levels to maintain the levels of aggregate consumption or demand as a contemporary dynamic equilibrium Say Model.

Today we also struggle with monetarism, like Keynesianism, as a mainstream conventional economic theory being taught in universities worldwide as being in a serious need of a replacement.

The Real Incomes Approach

In 1975 it was clear from anyone with undergraduate or post-graduate economics training from such organizations as Cambridge or Stanford Universities, that neither Keynesianism and monetarism theory and their policy instruments could solve slumpflation. Their application would seriously prejudice constituents and yet nothing in what he had been taught as economic theory or as policy solutions, provided any mechanisms for solving the issue.

Returning to "basics" to work out how the economy operates to identify gaps in theory and practice it became evident by 1976 that there were errors in the stated causes of inflation and the significant failure in conventional theory and practice to incorporate the roles of learning in technological innovation in economic growth. As a result, having

started this work in 1975 with no preconceived notions of its significance, real incomes were identified as the single most important economic indicator of economic performance and the purchasing power of wages of the majority. This work established a Real Incomes Approach to economics as the only macroeconomic theory directed at supply side decision making to augment productivity and real incomes based on changes in technology.

In this development work it was established that inflation of goods and services in the supply side economy was generally caused by cost push inflation and not by demand or money volumes²⁸. This applied not only in the slumpflation period but also to periods of so-called price stability. This proposition has always been contested by monetarists pointing to the Quantity Theory of Money (QTM) as the “proof” rather than referring to the evidence of the mechanisms of inflation. Milton Friedman, for example, could never explain the mechanism whereby money volumes create inflation. His “explanation” was that it happens in the “long run”, which, of course, is not an explanation of the mechanism. Indeed, evidence generated by 12 years of quantitative easing (QE) does not support the monetarist’s position. The copious evidence of the outcome of QE shows how this atomizes the economy into at least 7 main encapsulated asset markets, which are isolated from the supply side transactional economy. These isolated markets involving a small faction of high-income individuals are highly speculative with prices driven upwards intentionally by directing QE funds into them. Offshore investment also drains QE funds resulting in reduction in onshore employment. Savings are run down because interest rates are close-to-zero. No matter how much money QE has injected, inflation in the products and services purchased by wage-earners only becomes evident as a result of cost-push inflation caused by leakage of the speculative rises in the prices of land and real estate prices, driven by QE. This is explained in more detail the document, “Why monetarism does not work”. This analysis was also used to disprove the validity of the Quantity Theory of Money. Monetarists need to adjust their knowledge base on the real causes of inflation. After reviewing in more depth, the main references on Keynesianism and monetarism, the absence of adequate reference to the role of technology and techniques as significant gaps in Keynesian, monetarism (KM) theory and practice was duly recorded²⁹.

Constitutional economics

Advances in technologies, techniques and the central role of human learning to this process means that human capabilities are the central economic resource. Macroeconomic policies have a direct impact on the wellbeing of each constituent. However, our constitution is designed in such a manner as to break this essential link between the constituency and macroeconomic policy decision making processes. There is a significant democratic deficit constituting a serious economic and constitutional issue.

²⁸ The case of hyper-inflation (HI) is a specific case for which I could (author) provide an explanation based on direct experience of this phenomenon in Brazil. Although there is a correlation between HI and money volumes the cause and effect can be explained by price-setters attempting to maintain their real incomes by compensating for the currency devaluation impacts on their real incomes by setting pre-empting likely future inflation by raising their unit prices.

²⁹ McNeill, H. W., “*On the Problem of Technological Ignorance amongst KM Economists*”, Charter House Essays in Political Economy, HPC, December 1981, ISBN: 978-0-907833-10-9

Monetary policy is under the control of the Bank of England which operates out of reach of parliament and any participatory oversight by the constituents of the country. Bank of England decisions remain in the hands of a tiny committee. It is more than evident that the basic orientation of decisions comes from the financial services sector and banks with nods from the Treasury. Monetary policy and the status of and the role of the Bank of England never appears in political party manifestos at the time of General Elections.

During the last 12 years this constitutional arrangement created and has administered quantitative easing (QE) to maintain an abusive state of affairs where policy does nothing to advance technology, techniques and innovation to benefit real incomes of the majority but rather benefits very few constituents who pass QE funds into speculative markets to bolster their own wealth. Corporate shares, which in the past represented investments in companies who were investing to improve the prospects of their future and that of their employees, have become speculative assets where the price-to-earnings ratios have been destroyed by wholesale, formerly illegal, buy backs of shares with QE funds.

In the meantime, the QE-driven speculative rises in land and real estate markets have resulted in inflationary leakages into the prices and rents of land, housing, flats, offices, retail units, industrial units, warehouses, port facilities and some commodities to generate cost-push inflation in supply side operations leading to a need to raise prices or suffer reduced margins making any investment virtually impossible. Necessary QE imposed price rises reduce the real value of wages and have driven many in work to a state of pauperism.

In parallel needed funds for technological and technique development are denied through excessive interest rates, justified by banks on the basis of their assessment of the risk created by the QE environment. Saving to invest is penalised by close-to-zero interest rates imposed by the Bank of England.

In spite of universal suffrage, the United Kingdom's macroeconomic management today maintains the cavalier approach to the majority applied at the end of the 20th Century. International competitiveness was based on imposing lower wages on the majority. Policy makers have still not adjusted to the fact that supply side decision making has a central role in protecting the wellbeing of the majority through learning and technological advances to promote real growth.

This requires less centralised and arbitrary impositions in interest rate levels and money volumes and making use of incentives to encourage companies and individuals to maximise productivity based on their own independent decisions. There is an urgent need to transition to a constitutional economy where most of the population can determine the state of the economy based on their exercise of a responsible freedom that results in a common good.

Main source: McNeill H. W., "*Technology, Techniques & Real Incomes*", Series: Economics Briefs Number:003, Charter House Essays in Political Economy, February, 2021.

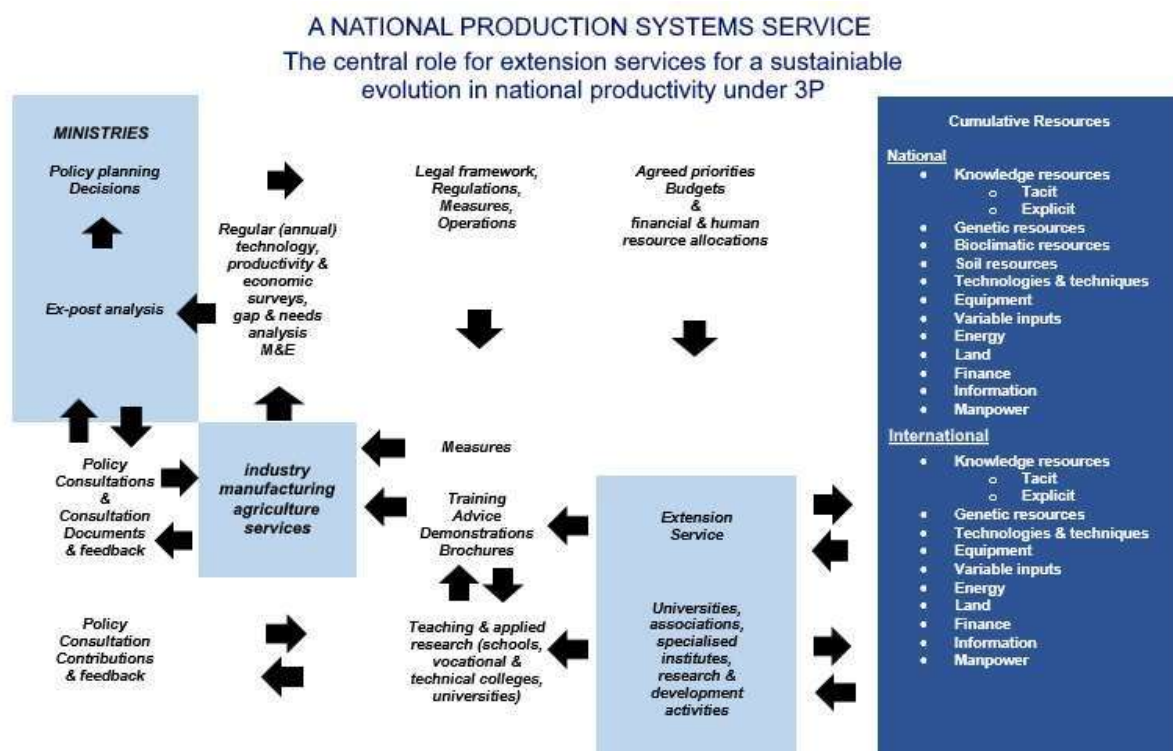
ANNEX 10 Extension Systems

Extension systems combine the functions of the collection of information on sector processes, technologies and techniques and analysing them from the standpoint of costs, economic and operational efficiency and convenience and average contributions to margins or profits (gross margins) to create benchmarks of state of the art of achievable performance generally classified into three practice categories of high, average and low or good or best, average and poor practice.

The central function of extension system in addition to this analysis and reporting based on data sets collected through sample surveys of sector participants, is the dissemination of this information through media, demonstrations including field demonstrations on the basis of an advisory function including training.

The overall objective of extension systems is to sustain a constant flow of information and knowledge on the state of the art of sector technologies and techniques as a basis for sector participants to evaluate their own performance with what is feasible.

Where operators find that their practice is below average or indeed the best practice the extension service data can usually indicate the gaps in their system or inputs causing the productivity deficit.



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