

Unemployment, Effective Demand and the Tax-Foundation of Money

Preliminary Draft

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Abstract

The problem of unemployment in modern capitalist deposit money economies has moral social and economic aspects. Its causes cannot be identified and potential solutions analysed without understanding the differences between such an economy and the idealised non-monetary economies of much mainstream thought. This paper makes an exploratory attempt to do this in a model where money is always created as loans with credibility given by the need for repayment, or as government issued money given value by tax liabilities. This is considered on the background of Weitzman's 'increasing returns' view of unemployment. In general there is no way of tackling unemployment that does not have significant real costs unless Weitzman's particular approach to the problem is considered.

Introduction

Why are resources, particularly human resources, underemployed? Not only is this a failure to make the best of our welfare, but in a society which explicitly assumes that we 'get what we deserve' condemns millions to needless poverty, social exclusion, humiliation and increasingly near-criminalisation for the sin of being unable to persuade firms to employ them at a liveable wage.

The core of mainstream thinking about employment is an economy in which Say's Law

is relevant - even if its operation may be subject to various frictions, particularly in the market for labour itself. Employment can be increased by lowering the cost of employing labour for firms, sharpening the cost-benefit separation between low-paid work and unemployment for labour-market participants, and by weakening the link between labour demand and nominal price rises. The Keynesian approach while, not directly disputing the logic of Say, renders it irrelevant to actual economic problems by seeing the features that prevent its action as being so ingrained and so sustained that since 'in the long run we are all dead' exogenous government action is required. In the Keynesian thesis the most problematic issue for a modern economy is the interaction between money and uncertainty – uncertainty in the 'we do not know' sense rather than that reducible to probabilities. Money greatly expands the opportunities for exchange, for wealth accumulation and for varying the timing of transactions. The result is an economy more complex, more productive, more prone to fluctuations in activity levels and more unequal than one relying on barter and trust. Money provides a buffer for uncertainty for individuals but acts as a magnifier of uncertainty for the economy as a whole.

Yet there may be something missing from this account. Once it becomes clear that firms have made expectational errors and that supply and demand of goods are at less than a full capacity equilibrium, why do not the unemployed simply fill the gap – employing themselves and capital at the going rate of return? Various answers could be given, but the one that seems most convincing and most difficult to overcome is that of increasing returns to scale. Weitzman (1982, 1984) argues that firms' exploitation of this phenomenon can explain both why the unemployed usually cannot compete with established firms at any acceptable return – *and* why firms may have little incentive to

employ unused resources to increase their output.

Falls in price as a result of increased supply of the firm's goods may set in quickly as more factors are employed under increasing returns exceeding any increases in effective demand. Wage reductions will be ineffective in persuading firms to take on new workers if the result is to lower demand by as much as costs. These problems do not apply to the usual assumption of constant returns to scale of total production in which Say's Law – at least if unfettered by frictions – must lead to full utilization of all factors. Note that increasing returns to scale does not mean full factor utilization is not possible – just that it is unlikely to be achieved spontaneously by pure profit-maximising firms.

Much of the discussion of unemployment and the role of policy in dealing with it involves discussion of monetary issues. Unless the relationship between money and economic activity is accurately described, explanations and solutions are likely to be misguided. Until quite recently the bulk of the economics profession has been in the grip of erroneous assumptions about the nature and role of money in the modern economy. Some recent developments suggest this may be changing at last.¹

In this paper we attempt to explore explanations and solutions for unemployment in the context of the actually existing mechanism of a deposit money economy, in which money is issued by private banks as a token of credit granted for new value creation, and by the government as a token valid for the discharge of tax liabilities. We do this on the background of Weitzman's insights.

¹ See McLeay, Radia, Thomas (2014) and Goodhart (2009) for example.

We start by exploring the moral, social and economic nature of unemployment in a developed capitalist economy, then move on to the critique of the mainstream approach. We then discuss the monetary features of a modern economy, before integrating these features with the foregoing critique to explain some mechanisms of unemployment. The next section of the paper assesses standard and alternative strategies to tackle unemployment. Then we outline the formal model and simulations on which the foregoing discussions are based, before concluding.

The Nature of Unemployment in a Developed Capitalist Economy

The problem of involuntary unemployment is ultimately the matching of a human agent to the capital he/she needs to produce consumable output, and if this output is to be exchanged, access to a market within which this output is demanded. Focussing on the first issue – employment becomes an issue as soon as land and its product, physical capital, are unequally or inadequately distributed. If everyone had access to an area of land adequate to provide subsistence (directly or reliably through exchange of essentials) in terms of food crops and animal husbandry for their families, it would not be unreasonable to regard those of sound mind and body who failed to work hard enough to maintain themselves as entirely responsible for, and even willing, their own misfortune.

With his description of the pin factory, Adam Smith cogently explained the inefficiency of this homogenous type of labour and capital matching. Specialisation in tasks and access to capital greatly raises efficiency of production. The inevitable complexity, however, creates greater scope for debate over what should count as a fair or unfair allocation of capital and income, with feedback effects from unequal skills to unequal

distribution and *vice versa*. Under these circumstances it becomes much more difficult to distinguish between those that suffer lack of work and poverty because of circumstances that are largely not within their reasonable control and those whose situations are self-willed. There is thus a trade-off in a developed monetary economy between a huge general welfare advantage and the possibility of undeserved individual deprivation. In particular, with the benefits of such specialisation most of the work that *needs* to be done to provide the basics of life for the population can be done using a small proportion of the available labour. Providing employment for the rest depends therefore on demand for non-essentials – which is likely to be both fluctuating and often highly uncertain.

Mechanisms of Unemployment

Unemployment in the Short to Medium Run

The starting point for mainstream theorising about the causes of unemployment is a labour market with upward-sloping supply and downward-sloping demand curves just like any other competitive market. At the right price (wage) that market will clear and no-one who wants to work will be without a job. It's then accepted that below and above certain wage points things are a bit different. A wage incompatible with the necessities of life is unlikely to be acceptable; above a certain income workers may begin to value the leisure they can then enjoy more than additional income. But between these points the failure of the labour market to clear and the existence of unemployment are due to 'frictions' that are in (nearly) everyone's interest to clear away. The nature of these frictions may include minimum wage rules, employment protection legislation, overgenerous unemployment security options, union bargaining intransigence and so on, collected together under the rubric of Labour Market Institutions (LMIs). These LMIs

form part of the notion that labour and firms as a whole can have market power such that when labour demand is high there is a tendency for wages to rise followed by prices. If the supply of purchasing power (money) is limited then these price rises mean that real demand must contract, pushing employment back down again. The unemployment rate at which the system settles is the NAIRU (non-accelerating inflation rate of unemployment). The only route to the reduction of long-run unemployment is to lower the NAIRU. This can only be done, the story goes, by reducing the market power of labour through reform of the labour market institutions (LMIs) listed above and to some extent by ensuring the competitiveness of the market for goods and services.

Of course this is very much a partial-equilibrium approach and omits two critical influences on the labour market, both of which followers of post-Keynesians cannot and do not ignore. Firstly there is the issue of demand: in a closed economy demand can only come from the income of workers and the profits of firms. What and how factors of production are paid in aggregate is therefore inextricably linked to what can be earned by firms in aggregate. Second is the issue of capital: a significant increase in workforce by a firm almost always involves an increase in capital investment. The nature of capital investment requires some long-run view of what demand is to be expected by the firm in the future. This introduces further issues.

Stockhammer (2012) critically analyses the 'NAIRU story' as described. Firstly, he argues that if contraction of demand does indeed follow inflation, since in reality the supply of money is not limited but is endogenous to economic activity (as explained subsequently), this is due to a secondary policy response from the central bank as it

increases interest rates. In this case the effectiveness of the adjustment depends on the impact of interest rates on demand. There may be occasions (liquidity traps) when interest rate changes have no effect on demand. Secondly, *effective labour demand*, taking into account changes in real wages, becomes indeterminate when distributional effects are considered and empirically may in fact be upward-sloping. Thirdly, any NAIRU equilibrium that does exist short of full employment may be endogenous. If strong and enduring, shocks may alter social wage norms and capital stocks enough to shift the point of wage bargaining equilibrium. Again, empirical evidence exists for this phenomenon.

Another objection to the NAIRU 'story' is that if firms are reluctant to invest in productive capital, because interest rates are too high or 'animal spirits' in the face of expectational uncertainty are too low, wage and other employment costs may not be the critical factor in determining firms' planned output and employment.

Unemployment in the Long-run

The work of Weitzman three decades ago (Weitzman 1982, 1984) helps make explicit what is actually implicit in the Keynesian view and absent from the mainstream view. A mainstream theorist could point to all of the issues we have discussed so far and say 'Well all these behavioural problems exist just now, but in the long-run once firms and workers have understood that they are their own worst enemies and that on average more investment leads to more output, more demand and more profits, then common-sense must prevail and workers who price themselves out of the labour market will have only themselves to blame.' But as Weitzman argues, this argument depends critically on the implicit assumption of *constant returns to scale* in production. In fact, under

constant returns firms are at no advantage to the sole trader. Supply of goods and services is as efficiently provided by individuals at prevailing prices, and so involuntary unemployment is simply not an operational concept. Free of any institutional barriers or frictions, everyone and everything willing and able to produce will do so and earn the income required for the effective demand of all output. If, however, as is surely the case, firms do have the advantage due to the usual catalogue of scale benefits, and this advantage continues to increase as they become larger, Weitzman shows that profit-maximising equilibria can exist at any level short of full factor utilisation. Under these conditions, individuals cannot compete with firms, and the resultant imperfect competition means that if existing workers accept lower wages the predominant effect may be to lower demand to the extent that employment *falls* rather than increases. (The latter fits with the empirical evidence of an upward-sloping labour demand curve as cited above.)

Moreover, the existence of a profit-maximising steady-state at any given level of factor utilization and output explains the role of animal spirits in investment. To invest requires a leap of faith that the future for the firm's demand will *not* be as it has been in the past but in fact will be different enough to justify the initial disturbance and reduced profit the increased output is likely to initially create in its own market.

The Role of Money in Factor Utilisation

Almost all discussion of unemployment beyond institutional labour-market issues involve the role of money. The place of money in mainstream models is notoriously inadequate, and even in heterodox thinking is frequently confused and inconsistent.

Money Creation and Production

Much of the failure of the neoclassical approach is that it ignores the critical role of *money creation* in a monetary economy, which is prior to and as important as, money's roles as medium of exchange and store of value. Money is issued as a claim on future production. For private money and private production this claim is exercised by purchase in competitive markets. For public money and 'production' of public goods the claims are exercised in the form of a discharging of tax obligations. Once issued, social credibility given through trusted authorities and institutions gives money its universal acceptability in the payment of any debt or liability by any bearer (Weir 2013).

The creation of private or public money is a contract to share the benefits of future output with those providing the inputs required for the *production* of that output.² Any production process, or indeed any value-enhancing transaction in general, that involves a delay and consequent uncertainty in the arrival of final output, is likely to be greatly facilitated by such a contract. In such a contract the benefits from future output can be represented and transferred ahead of the completion of production and in the form of general purchasing power that can be redeemed against the output of all current and future production. Money creation is involved in initiating production not because money and debt are unique and particularly pernicious features of capitalist economies, but because money and debt creation is a rational social response to the natural phenomena of time and uncertainty (Fontana 2009). It is a mechanism from which all participants (including the credit-money guarantor or banker) can gain by allowing the credible sharing of the proceeds from *new* value-creation opportunities spotted by any

² The only general exception is 'money' whose intrinsic value equals its face value. This money is thus itself part of current output.

agent or agents, including the state.³

Money in Exchange

Contrary to the usual neoclassical story money's role in exchange is a secondary phenomenon – although no less important for that (Wray 1990). As a portable, fungible and non-perishable token of value that has no other use it is the ideal solution to the absence of a double co-incident of wants in exchanges otherwise beneficial to both (or more) parties. Yet these qualities making it so attractive to the individual agent are the source of some serious problems at the systemic level. We have discussed above the reliance of mainstream thinking on Say's Law that supply must ultimately create its own demand. While ultimately the logic of this is undeniable within the constraint of actual production – since all monetary income is accepted only with a view to ultimate expenditure – the enhanced ability to delay that expenditure by holding money balances introduces new elements into the economic picture. Keynes elegantly described the motivations for this delay, although the quantification of their proportionate effects is probably not feasible. In any case the result is that between receiving money in exchange for goods and spending it again an individual agent may wait for any and a variable length of time. The effects of this are most understandable in a paper money economy model without ledger or electronic bank deposits, which we now proceed to describe.

A Simple Endogenous Paper Money Economy

If we consider a single period in which a quantum of paper money is issued as exchangeable tokens of credit to facilitate production, recipients of credit are reliant on

³ For further descriptions of this 'circuit' approach to monetary flow see eg: Fontana (2000), Graziani (2003), Rochon (1999) and Weir (2008), Chapter 3.

receiving this paper money in exchange for their output in order to repay their loans at the end of the period. Remembering that this paper money may pass through many hands in its secondary exchange role, there is the distinct possibility that some agents may wish for transactional, precautionary or speculative motives to receive but not spend within the period. (An appreciation of the fundamentally unknowable rather than probabilistic nature of the future makes this more likely than not.) Some agents may also wish to accumulate money (save) to pay for capital goods that will take them more than one period to be able to afford. The consequence of all of this is that at least some borrowers do not receive their expected income within the period and are unable to repay all of their debts at the end of it. This failure to repay will impact on the balance sheets of both borrowers and lenders.

Once we extend this model to subsequent periods however the problem of ‘held-up’ money can be solved reasonably straightforwardly. As Keynes argued, what agents are accumulating are *balances* or stocks of readily available cash. Once the target balances are reached, all further income will be spent in the period in which it is received. If the resultant steady-state gaps on the borrowers’ and lenders’ balance sheets can be filled as a one-off asset creation exercise, the money creation, circulation and destruction process can then continue smoothly and indefinitely. Accumulation for the purchase of capital stock will require additional asset injection in each period to restore balance sheets until all desired capital stock is purchased. Of course we now have the problem of where the assets required to restore borrowers’ and lenders’ balance sheets are to come from. Enter a state-backed central bank that issues its own money and puts it into circulation either by lending to the government for its purchases or by lending directly to the private banks. Credibility and value is given to this money (and only this money) by its

acceptance for the payment of taxes imposed by the government on its population and on firms. Private banks can ‘piggy-back’ on the desirability and the security of this state-backed money, as well as using it to settle inter-bank transfers, by guaranteeing a 1:1 exchange of their money with the central bank issued money. This is covered in more detail later.

An Endogenous Bank Deposit Money Economy

In an economy where only paper money is used it is obvious that ‘held-up’ money is static and fulfilling no transactional purpose, traditionally lying in a safe or perhaps stuffed in a mattress, although it leaves a sort of shadow imprint on the asset side of banks’ balance sheets as yet unrepaid loans, and on the liability side of borrowers’ balance sheets as undischarged debt. The actual stock of money used in transactions is physically distinct from that being accumulated. When we move to banks creating money that only exists as ledger entries or in the modern case database entries, things can become confusing since these entries remain on the banks’ books or databases until the loans that created them are repaid. They clearly cannot be physically hoarded away from the financial system. Even if these deposits change hands in intermediate exchanges they remain continuously on the books as a liability of some bank. This creates the misleading impression that it is these deposits that are being loaned out, rather than the reality that the deposits were created by the issue of loans. Moreover, whereas it is easy to understand that fluctuations in economic activity may well be caused by the rise and fall of paper money hoarding as these are accumulated and decumulated, it is less obvious that the same can happen with bank deposits since there is no obvious distinction at any point in time between those deposits that are being used in transactions and those that are not. The evidence for deposit balance fluctuations is

contained in the measure of transaction velocity, which usually cannot be directly calculated as the information required is not published by central banks and statistical agencies. What information we have is of *net* lending and GDP-relevant transactions, whereas to calculate transaction velocity we need to have information on the gross flow of lending and repayments and of the quantity and value of all transactions whether or not they are counted in final income or expenditure. (Werner 2012)

Money Velocity in a Deposit Money Economy

The relationship of velocity and deposit ‘hoarding’ can be derived from the standard quantity equation, given that measured money stocks, being averages of deposits held are in fact a measure of ‘hoards’ rather than flows. Where M is the measured money stock, V_T transaction velocity, P the average price level and T the total quantity of transactions,

$$MV_T = PT \quad (1)$$

implies
$$V_T = \frac{PT}{M}, \quad (2)$$

which indicates that any increase in money balances, given constant P and T , will be manifest as an decrease in transaction velocity, although in fact the money actually flowing through the economy will be working harder!. Unfortunately as Werner indicates velocity of money covers many transactions with varying import. T and therefore V_T include all secondary exchanges of previously existing or non-manufactured goods – for most of which the welfare increment is small. Even if we replace total transactions with GDP, as Werner notes, a lot of those transactions are dubiously related to actual welfare.

The Impacts of Balance Holding

If there is a steady-state level of inactive money balances, whether in paper or deposit form, firms can in the short-run plan their factor employment and output with reasonable confidence. In the medium-term, however, real or expectational shocks may cause the additional hoarding of money (evidenced by the accumulation of paper money or a fall in transaction velocity of deposits in the respective economies), a fall in demand for goods and services and the inability of firms to repay loans. This leaves the balance-sheets of both firms and banks impaired with impacts of their future abilities to borrow and lend. To some extent at least, balance-sheets can be repaired if the central bank can supply ‘filler’ assets cheaply and on demand that can get to banks *and* to borrowers.

The Role of Central Bank Money

The existence of money issued by a central bank in an endogenous deposit money economy is frequently a source of further confusion – particularly perhaps because paper money in such an economy is actually the physical form of *this* money rather than of that issued by private banks which never takes a physical form.⁴

Central bank issued money (high-powered money or HPM) serves two critical purposes in an endogenous deposit money economy. Firstly it fulfils the role of the ‘filler’ asset required to maintain banks’ and firms’ balance sheets in the face of the holding of inactive deposits by intermediate recipients of money who are neither lenders nor borrowers of that money. Secondly it allows competing commercial banks to accept

⁴ This is true even although, such as in Scotland or Northern Ireland, banknotes are issued with the identity of particular banks. These notes are all ultimately interchangeable however only with reserve deposits issued by the Bank of England.

each other's deposits at equal value, since any net deficit or surplus at the end of a trading period resulting from deposit transfers is made up by a transfer of HPM from the deficit bank to the surplus bank. In the same way that the acceptance and value of private bank money derives from its demand for loan repayment, HPM derives its acceptance and value from its demand for the discharging of tax liabilities.⁵

Private banks therefore find themselves needing to have a stock of HPM on hand to meet demands for paper money by deposit holders, tax payments by deposit holders and deposit transaction deficits with other banks. The more loans they issue, the more deposits they create and the more reserves they require to hold for these eventualities. This HPM can enter the economy in various ways. Most enters by government expenditure: as firms' and individuals' deposits are credited the private banks with which these accounts are held are provided with matching reserves – themselves liabilities on the balance sheet of the central bank. These reserves then leave the banks' accounts when their deposit holders discharge their tax liabilities. Since reserves do not earn interest (usually) for private banks, they wish to minimise their holdings with the result that the deficit-surplus mismatches described above may require immediate access to new reserves. Banks can obtain these by borrowing directly from the central bank against collateral (usually government securities) at a fixed interest rate set as policy by the monetary authority (Gray & Talbot 2006).

⁵ The rationale for this 'tax-foundation' of money is explained in Goldberg (2012). The interaction between this mechanism and the role of HPM in the acceptance of private bank money is modelled in Weir (2013).

The Mechanisms of Short-run and Long-run Unemployment in a Deposit Money Economy

We are now in a position to provide a descriptive model of how unemployment (of all factors including labour) arises, persists and fails to disappear spontaneously in any relevant time-scale in an economy with a monetary structure corresponding to the one that actually exists.

All labour-market frictions are assumed away. All expenditure is for consumption. Capital accumulation can be ignored for the purposes of the model since this has no monetary consequences as the destination of saving is firms – the distinction from consumption being only that the ultimate receipt of consumption goods by individuals from firms is delayed. The economy uses deposit money created by private and central bank loans and by government expenditure. Loans are issued to firms by the banking sector, which is modelled as a single block. These loans are issued in the form of deposit money held as a liability on the banks' balance sheet to match their loan assets. Banks charge firms for these loans according to the cost of the reserves they require to hold in relation to deposits.

Under constant returns to scale in equilibrium all available inputs are used. With increasing returns and imperfect competition as described by Weitzman the equilibrium level of activity will involve the matching of supply and effective demand but factor utilisation may be at any level. Since we have excluded capital there is only one factor of production – labour. In each period firms borrow from private banks to employ a certain quantity of labour for the purpose of production. The money created as these loans are issued is paid out and a varying proportion spent by workers on the consumption goods produced by the firms. Any money that is not spent in the period it

is received forms outstanding deposit balances at the end of the period. It is assumed for the purposes of the paper that the monetary authority mandates a reserve ratio on outstanding deposits, although in reality with multiple competing banks these would set their own prudent reserve ratios. Banks can acquire reserves in two ways – they can either borrow them from the central bank at a fixed rate or they can acquire them as a consequence of government spending since such spending must involve the crediting of private bank deposits accompanied by a matching flow of HPM. If all income is used to purchase goods from firms in the period in which it is earned then all money returns to firms in that period allowing them to repay their loans. In that case there are no outstanding loans and no outstanding deposits. Clearly this is rather uninteresting, so we assume that individuals wish to hold a certain level of money balances, for the standard motivations, which they build up by hoarding part of their income each period. Since this money does not return to firms to allow them to repay their loans, banks find that they accumulate outstanding loans so requiring them to acquire reserves.

The part of output paid in interest to the banks has no direct monetary implications since it is assumed to effectively be a transfer of goods from firms to banks in exchange for lending services. It does of course have indirect effects though in how the cost impacts on firms' willingness to borrow. Firms' expectations of effective demand may turn out to be wrong, and so they may either have too many or too few goods in the market.

If there is no government spending the economy reaches a steady state with constant levels of output and employment once the level of desired balances is reached by individuals. There is then a positive quantity of money deposits and reserves at the end of each period. Firms have outstanding loans at the end of each period, but as long as banks can acquire all the reserves they need they can continue to lend. The reserves are

required at a cost which is transferred to firms. The higher this cost the less firms are willing to borrow.

Increase in Firms' Expectations

We trace the effects of selected shocks under constant returns/perfect competition and under Weitzman increasing returns/imperfect competition. Under constant returns there are no barriers to full input utilisation, so clearly the only impact of a positive expectational shock created by firms is simply to temporarily push up the price of inputs. This will be transferred to the price of outputs before equilibrium is re-established. In the case of increasing returns, there may be idle inputs and although there is initial disruption in the firm's market by a unilateral increase in borrowing and the employment of inputs there is the possibility of moving to a higher level of activity. What makes the decision one of 'animal spirits' is the reliance on other firms to increase their own activity and employment at the same time to maintain demand at a level required to avoid the firm making losses as it moves away from its initial profit-maximisation point.

Reduction in Inactive Balances

More interesting is the case of a positive expectational demand shock. For some reason agents expect to have less expenditure in the future than they do now. As a result they increase spending in the present period and decrease their inactive balances – which may also be measured as an increase in the transactions velocity of money. To the extent that firms fail to anticipate this increase in demand by increasing employment and output, choose not to do so, or cannot do so because they are already at full employment they will find themselves able to repay outstanding loans. The central bank can step in here and withdraw the additional deposits, but clearly firms adjust to the increased

demand in a competitive market by increasing prices to restore equilibrium. The result under constant returns is ultimately a proportionate rise in wages that brings supply and demand for goods back into balance at full employment. Note that the wrinkle here is in the role of the monetary authority. The assumption of the monetary authority's full adaptation avoids the operation of balance sheet effects that might exacerbate the initial demand increase either by increasing firms' ability to borrow and spend or increasing banks' willingness to lend in subsequent periods. Assuming this adaptation and that it is costless, there is no necessary change in welfare here since the demand shock can be a result of consistent preferences in face of rational expectations and so this increased demand in the shock period will be reversed in future periods.

Under increasing returns to scale when firms receive additional revenue allowing them to repay their debts, this decreases their interest charges and increases their willingness to borrow. In this case if there are unutilised inputs this may increase subsequent output and employment. If this process starts from an equilibrium of supply and effective demand, then depending on how long this adjustment takes, there may initial price level rises.

If for some reason, individuals desire to *increase* their inactive balances, then firms find themselves unable to repay loans, and banks find themselves requiring additional costly reserves. This charge is passed on to firms reducing their borrowing capacity and lowering output and employment.

What if the central bank fails to intervene appropriately in this latter case? In the constant-returns case, the debt on firms' balance sheets will increase and the loans to

reserves ratio of banks will increase. In the medium-term this may reduce lending and borrowing resulting in further falls in activity and wages, but not employment. As soon as spending, inactive deposit balances and transactions velocity return to normal, lending and borrowing will continue at their previous rate. The only effect of central bank activity is to smooth fluctuations. Even if firms shed workers in the short run, the ability of workers to individually employ capital and produce output competitively puts a brake on unemployment. In the case of increasing returns, there is no adjustment mechanism and the damage to the balance sheets of firms and banks may have long-run crippling effects exceeding those that arise simply from increased reserve costs.

Increase in real wages

What are the effects of a negative supply shock in the form of an increased cost of inputs – in this case an increase in real wages? Under constant returns, the initial impact will be to lower employment since the firms' loans will not cover the new wage-bill. Output will fall and prices rise. There are now two mechanisms that will bring employment back to its previous level. Firstly, seeing the price of output rise they can increase their loans in subsequent periods. Even if this does not happen, the newly unemployed workers have no obstacle to setting up in competition to the firms at the same nominal wage, but clearly a lower real wage. Eventually the real wage falls to its previous level matching effective demand to output. Assuming the wage decrease is accepted by workers, there will be no unemployment.

Under increasing returns, if there is a rise in the cost of inputs to firms this may result in problems that are much more long-lasting. Once workers are shed, they cannot easily employ capital independently and there is little incentive for firms to re-employ workers

even when supply or demand shocks are dissipated since they cannot individually break out of the new lower employment equilibrium without increasing initial losses.

Empirical Comparison

These descriptions can explain most of the empirical discrepancies from mainstream unemployment theory that Stockhammer notes. There is no need for general price rises to automatically limit demand since the money supply can respond endogenously. If prices and wages both rise the increased loans firms require (creating more money in the process) to pay factor inputs will be covered by the increased payments for the purchase of output. We will come back to Stockhammer's story of the role of the central bank policy response to price rises.

Weitzman's model provides a further explanation of why wages and labour demand may not show a downward-sloping relationship as the feedback from lower factor returns to decreased demand kicks in without any correcting mechanism to increase factor employment. Again the ability for any level of employment to be an equilibrium suggests that when shocks shift that equilibrium it tends to remain in its new position. Again this provides another reason to suppose that the NAIRU is likely, as far as it exists at all, to prove an endogenous concept.

Finally, what we have described fits perfectly with Stockhammer's Post-Keynesian story of investment being the volatile and unpredictable prime-mover of aggregate demand and employment since it is essentially a leap in the dark while providing the only certain shifter of equilibrium.

Central Bank Policy Reaction

We have seen the importance of the role of HPM in filling gaps in banks and firms' balance sheets as inactive deposits are held. In a steady-state with a constant level of deposit holding (transaction velocity remains constant in relation to transaction value) a constant level of HPM 'filler' does the job, assuming there is a friction-free path for HPM to reach the balance sheets where it is required. In the face of a shock, however, deposit-holding may increase or decrease – impacting directly on balance sheets. In this case extra HPM is required to avoid knock-on shrinkage of demand. Banks can normally obtain additional HPM from the central bank in 'Open Market Operations' (OMOs) against high-quality collateral (usually government bonds) and at interest (Gray & Talbot 2006). Clearly the rate of this interest has an impact on the extent to which banks are willing to take up further HPM to allow them to maintain their reserves in the face of their current rate of loan issue. Too high a rate may result in a reduction of loan issue (either due to rationing or passing on the higher costs to borrowers); too low a rate may encourage lending and borrowing in excess of the real productive capacity of the economy. Stockhammer's suggestion that central bank policy is responsible for a downward sloping aggregate demand curve suggests that in general, central banks operate a 'tight money' policy where the interest-rates they charge to banks for additional HPM is artificially high (in effect that this rate is higher than the cost to the state of supplying 'filler' HPM on demand).

Assessing Standard Strategies to Tackle Unemployment

Labour Market Institutions

If the integrated model we have presented is roughly correct, then most Labour Market Institution 'reform' is largely misguided, probably welfare reducing and actually pretty

morally dubious. Most of these reforms have the effect of reducing the bargaining power of labour, with the result that real wages fall. Both the Weitzman increasing returns mechanism and that of Stockhammer working through distributional and investment effects suggest that wages, demand and output will move together. Reduction in wages thus tends to lead not to greater employment but to less as suggested by the empirical results cited by Stockhammer. Bearing in mind that the existence of unemployment is a consequence of the unequal distribution of a limited quantity of land and manufactured capital exacerbated by the efficiency of large-scale production technology from which the majority benefit greatly, it seems difficult to justify the prevailing punitive approach to the unemployed. Since it can do little more than induce greater churn in the labour market with little impact on resource utilisation and output, such an approach reduces the welfare of the unemployed with no benefit for the employed. It is ultimately a political strategy rather than an economic one.

Monetary Policy

Short-run negative shocks that alter the liquidity preference of either banks or non-bank agents or both with the result that new loans are hard to come by and existing loans cannot be repaid can not only cause short-run reductions in output and the reduction in labour utilisation with resultant unemployment. As a result of the possibility of multiple unemployment equilibria as argued by Weitzman and Stockhammer the medium-term running down of capital stock as investment is reduced results in long-run increases in unemployment that are not easily reversed. On the other hand too free an issue of HPM may encourage reckless lending, since it becomes too easy to allow non-performing loans to build up on banks' balance sheets, an excess of money to circulate in the economy and nominal prices to rise. The primary role of the central bank is then to

choose the ‘right’ interest rate to maximise (within the accepted paradigm) aggregate demand and employment while avoiding significant inflation. As Stockhammer points out it is well-recognised that there are several situations in which further changes in interest rates either become impossible (as the rate approaches zero) or are likely to be ineffective because of additional strong motivations to avoid lending or investing. This is particularly to be expected if the Weitzman story is a true reflection of the position. If current factor utilisation is an equilibrium for firms irrespective of cost the availability of cheaper loans is no incentive for increased activity.

Standard Fiscal Policy

Making it cheaper for banks to acquire reserves does little in itself to repair the balance sheets of non-bank agents who have seen a revenue drop that leaves them with an excess of undischarged liabilities. This requires a fiscal injection that boosts firms’ revenue. But the recognition of the role of taxation tells us that at some point in the future, without an increase in long-run factor utilisation, this fiscal stimulus will need to be taxed back. As Werner (2012) argues – in this case there is no aggregate net long-run income stimulus. There is however a potential benefit in preventing a bad situation becoming worse by avoiding the establishment of a new equilibrium with lower unemployment from an otherwise temporary shock.

Alternative Policy Proposals

Werner’s ‘Quantity Theory of Credit’

Werner (2012) argues that failure to understand the nature of credit and money creation leads to poor policy-making. In particular, he argues that only productive economic activity associated with new money creation represents genuine additional aggregate

income. He argues that attempts to stimulate a sluggish economy must ensure that new money is created if it is to be effective, and that moreover that the credit issued to create this money must be for genuine productive activity rather than speculative trading or pure consumption. He further argues that government expenditure funded by taxation has a net neutral effect on the flow of money through the economy and so the government should borrow from the private sector.

While Werner's analysis is general accurate, he appears to ignore or at any rate downplay the role of fluctuating levels of inactive deposit balances – since contraction of such balances is one way in which a temporary boost to activity may occur (and vice versa when these balances reduce. He is surely right that analysis of the nature of economic activity associated with money creation is important – although this may be more difficult than it first appears. Speculative borrowing and consumption borrowing do have the ability to increase welfare if they lead to beneficial time-shifting or re-allocation of assets. These welfare benefits can be monetised. When they are undertaken recklessly, the mechanism of bank equity write-off *should* ensure that the issuing bank absorbs the excess purchasing power (Hitchins, Hogg, Mallett 1996). (Unfortunately, in practice this can happen slowly, incompletely or not before a Ponzi-type bubble has been created.) When the latter occurs the damage created by its collapse to both the bank and non-bank sectors can be considerable. In any case such time-shifting of consumption and re-allocation of capital goods and asset-claims are clearly second-order activities in relation to the production of new goods and services, so that their dominance over the productive sector is a problem.

Lastly it is not clear that Werner's proposal for government borrowing from commercial

banks achieves much. This is because of the role of High-Powered Money – which Werner does not really discuss. As deposits created by bank loans to government are transferred to other banks HPM will be required to move with it. When interest and repayment become due, the government must acquire this money somehow – unless as the revenue of government enterprise this money will have to be created by the government itself – and ultimately balanced by a tax liability.

The Job Guarantee Approach

A much-discussed proposal for tackling unemployment among some heterodox economists is the ‘Job Guarantee’ (sometimes referred to as Employer of Last Resort or ELR) approach (Mitchell & Mosler 2001, Wray 2006). In essence, the government always stands ready to provide employment, at or around the minimum wage, to those who cannot find employment elsewhere. The argument is in part a monetary one: since it is argued that since sovereign currencies such as the US dollar or UK pound can be issued costlessly by the government this power should be used to eliminate unemployment. The wage-cost of providing the guarantee will be at least partly offset by the social and health benefits, by the existence of a better-prepared and better-equipped workforce and by the fact that the additional demand from the otherwise-unwaged will encourage increased private-sector output and employment – eventually shrinking the pool of government employees. This latter point is clearly linked to Weitzman’s and could perhaps be seen as a way in which the bargaining power of the unemployed is increased. Mitchell and Mosler (2001) contrast the existence of a buffer of government employment to the existence of a NAIRU. As with Stockhammer’s analysis, the NAIRU exists because as inflation rises, the monetary authority raises interest rates and implements other policies to limit demand. In response, firms reduce

their workforces and unemployment increases. Under a Job Guarantee, instead of a shift from private employment to unemployment there is a shift from private to government employment. Since government jobs are at the minimum wage the average wage falls, reducing inflationary pressure.

The obvious mainstream objection to such a scheme is that it is likely to involve long-term deficit spending by the government, even allowing for some of the off-sets mentioned. The scheme's proponents point out the accounting relationship between private saving and public debt – the mechanism for which is described above – to demonstrate that there should be no objection to deficit spending in itself. The assumption would be that with higher levels of employment and demand, saving and the demand for government bonds would also be higher. There seems a caveat to this response however which is that unless the demand and saving increase exactly offset the cost of providing the wage guarantee (or at least boost growth enough), the policy will lead to an increase in the annual *deficit*. In this case government liabilities may rise continuously faster than GDP. This would be regarded in mainstream economic circles as unsustainable at least for countries whose currency was not a major reserve asset – and is certainly likely to have some problematic consequences.

On the other hand, particularly if other under-utilised resources exist, there is scope for these government-employed workers to carry out welfare-enhancing work where private-sector supply is poor. The problem then becomes how this is monetised. If this cannot be done in the market, then taxation must rise with all the political implications this brings; if it can be done in the market then the question arises as to whether it might not have been a better policy to persuade or enable the private sector to employ the

relevant factors and create the relevant output.

The Share Economy

This brings us finally to Martin Weitzman's profit-sharing approach (Weitzman 1982, 1984). This is based on a simple theoretical observation. A firm that is operating at the profit-maximizing point where marginal revenue matches marginal cost will not want to take on another worker at a fixed wage. If, on the other hand, workers were paid not a fixed wage but compensation that varied at least in part as a share of the revenue of the firm, then the employment of an additional worker would reduce the average cost of output, allow prices to fall and production to expand. The additional demand from the employed worker has a knock-on increase in demand for the products of other firms with the result that a balanced expansion can ensue until genuine full employment is reached. In this case there are no concerns about the correct setting of monetary policy, the timing of fiscal interventions, government deficits or taxation increases since all the corrections are occurring at the level of the firm. Inflation should not be a significant problem because if current workers obtain higher wages the firm has the option to employ new workers until the share portion of remuneration falls so that workers are once more earning their marginal product of labour. Even should intervention be necessary, the use of monetary policy will be much better targeted on prices and wages rather than employment.

Formal model and simulations

This is a simple (indeed, somewhat simplistic) model of an endogenous deposit money economy as described. Its purpose is mainly to demonstrate that the analysis given is at least logically consistent and is in the spirit of the stock-flow consistent models

pioneered by Godley and Lavoie (2007). The numerical outcomes are completely arbitrary. In the face of uncertainty of expectations predictions are not possible. Except in one or two cases I will specify it doesn't matter whether we regard values as real or nominal. In general since we believe this is a more accurate picture of the existing economy we are interested in the outcomes of the Weitzman-type increasing returns/imperfect competition economy.

Loans are issued to firms by the banking sector, which is modelled as a single block. These loans are issued in the form of deposit money held as a liability on the banks' balance sheet to match their loan assets. Banks charge firms for these loans according to the cost of the reserves they require to hold in relation to deposits. The initial expected level of activity of firms is set at an arbitrary level such that they require a certain quantity of loans each period to purchase productive inputs (labour). Whether or not firms expect to utilise all the available labour they do expect to match supply and effective demand. Exogenous factors or 'animal spirits' may shift activity levels. Thus:

$$L_t = (9000 + \alpha) / (1 + d) \quad (3)$$

where L_t is aggregate loans issued in the current period, α represents 'animal spirits' and d represents the aggregate charge made by banks for the issue of loans as detailed below. For simplicity we assume only one factor of production – labour, so that the number of workers employed at any given wage w is therefore

$$l = L_t / w. \quad (4)$$

(Since the working population is n , the number of unemployed u is determined by $n-l$.)

The money created as these loans are issued is paid out and a varying proportion spent by workers on the consumption goods produced by the firms. Any money that is not spent in the period it is received forms outstanding aggregate deposit balances M_t at the

end of the period. It is assumed for the purposes of the model that the monetary authority mandates a reserve ratio of 0.1 on outstanding deposits, so that $R_t = 0.1M_t$, although in reality with multiple competing banks these set their own prudent reserve ratios. Banks can acquire reserves in two ways – they can either borrow them from the central bank at a fixed rate or they can acquire them as a consequence of government spending G_t since such spending must involve the crediting of private bank deposits accompanied by a matching flow of HPM. Thus the aggregate reserves banks require to borrow in each period is given by

$$\Delta R_t = 0.1\Delta M_t - G_t \quad (5)$$

The level of borrowed reserves held each period is therefore given by

$$R_t = R_{t-1} + \Delta R_t \quad (6)$$

And the interest banks must pay on borrowed reserves in each period is $i_R R_{t-1}$. Since we assume that banks make zero profit, they pass this charge directly on to firms so that

$$d = i_R R_{t-1}. \quad (7)$$

If all income is used to purchase goods from firms in the period in which it is earned then all money returns to firms in that period allowing them to repay their loans. In that case there are no outstanding loans and no outstanding deposits at the end of each period. Clearly this is rather uninteresting, so we assume that individuals wish to hold a certain level of money balances \bar{b} , for the standard motivations, which they build up by hoarding part of their income hw each period. If in any time their balances are greater than \bar{b} then they reduce their balances by hw . The following conditions determine h : if previous period balance $b < \bar{b}$ then $h = \varepsilon(\bar{b} - b_{t-1})$; if $b = \bar{b}$ then $h = 0$; if $b > \bar{b}$ then $h = \mu(b_{t-1} - \bar{b})$, where $0 < \varepsilon < 1$ and $-1 < \mu < 0$. We can therefore determine that

$$\Delta M_t = hl, \quad (8)$$

and since this money does not return to firms to allow them to repay their loans, banks find that they accumulate outstanding loans according to

$$\Delta L_{ut} = \Delta M_t, \quad (9)$$

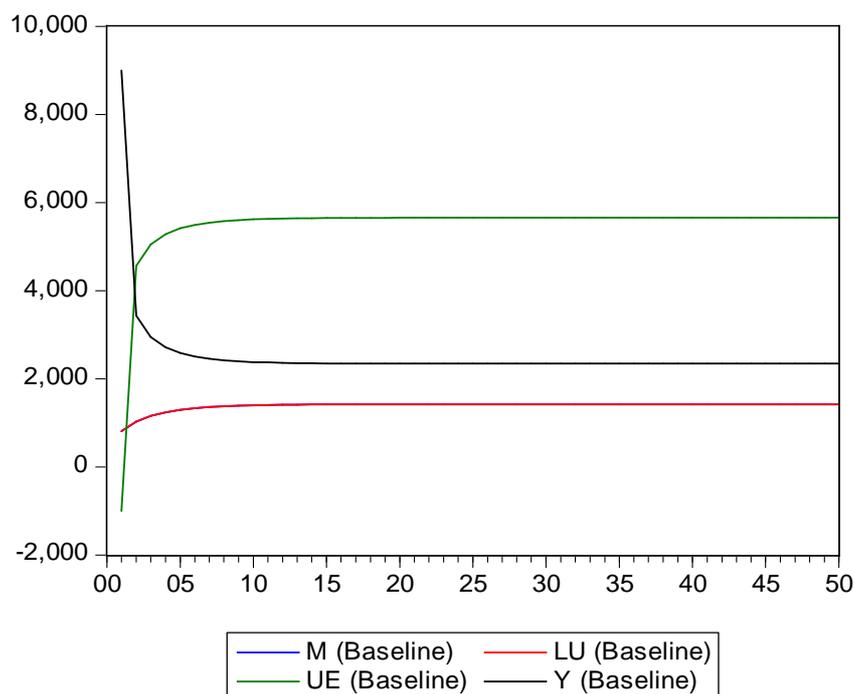
so requiring them to acquire reserves according to equation (3). Since firms expect to make zero profits with the value of their outputs exactly matching their inputs, and so the firms output and expected revenue is given by

$$y = wl + d. \quad (10)$$

The part of output d paid to the banks has no direct monetary implications since it is assumed to effectively be a transfer of goods from firms to banks in exchange for lending services. It does of course have indirect effects through equation (1). If $h \neq 0$, then firms' expectations turn out to be wrong, and so initially they either have too many or too few goods in the market. If they have too many relative to effective demand then there is an effect on the price level p in the form: if $q/y > p_{t-1}$, then $p_t = q/y$; if $q/y \leq p_{t-1}$ then $p_t = p_{t-1}$. Inflation is then given by

$$\pi_t = \frac{P_t - P_{t-1}}{P_{t-1}}. \quad (11)$$

Figure 1 – Baseline Simulation

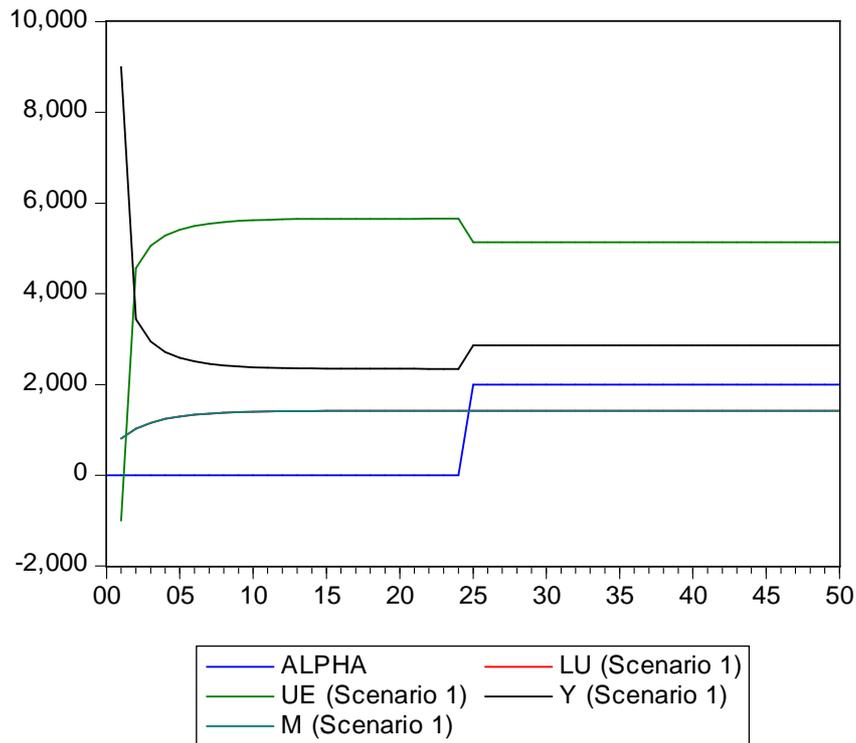


M = Money Stock (M_t); LU = Outstanding Loans (L_{Ut}); UE = Unemployment (u);

Y = Output (y)

We simulate the model over 50 periods (arbitrarily 2000 – 2050) and apply shocks to exogenous variables. The baseline scenario (Figure 1) has no government spending and so reaches a steady state with constant levels of output and employment once the level of desired balances is reached by individuals. There is a positive quantity of money deposits and reserves. Firms have outstanding loans at the end of each period, but as long as banks can acquire all the reserves they need they continue to lend although this is at a cost that they pass on to firms. The initial values given to the exogenous variables are as follows: $\alpha = 0$; $\bar{b} = 0.3$; $\varepsilon = 0.3$; $g = 0$; $i_r = 0.02$; $n = 8000$; $w = 1.0$.

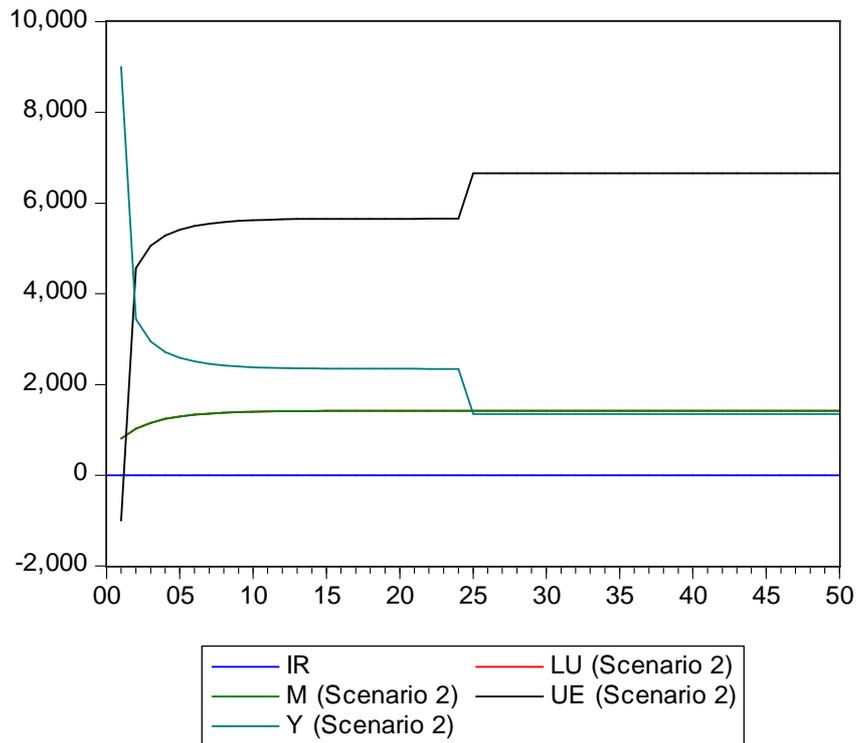
Figure 2 – Animal Spirits



ALPHA = Supply fluctuation (α)

The first shock we apply is to make α a positive value ($\alpha = 2000$ from year 2025), implying an increase in animal spirits and increased borrowing. The outcome will depend on whether there is full utilisation of inputs – if so only price and wage rises will result with no real changes. If there is not full utilisation, firms borrow more, increase output and employment rises (Figure 2).

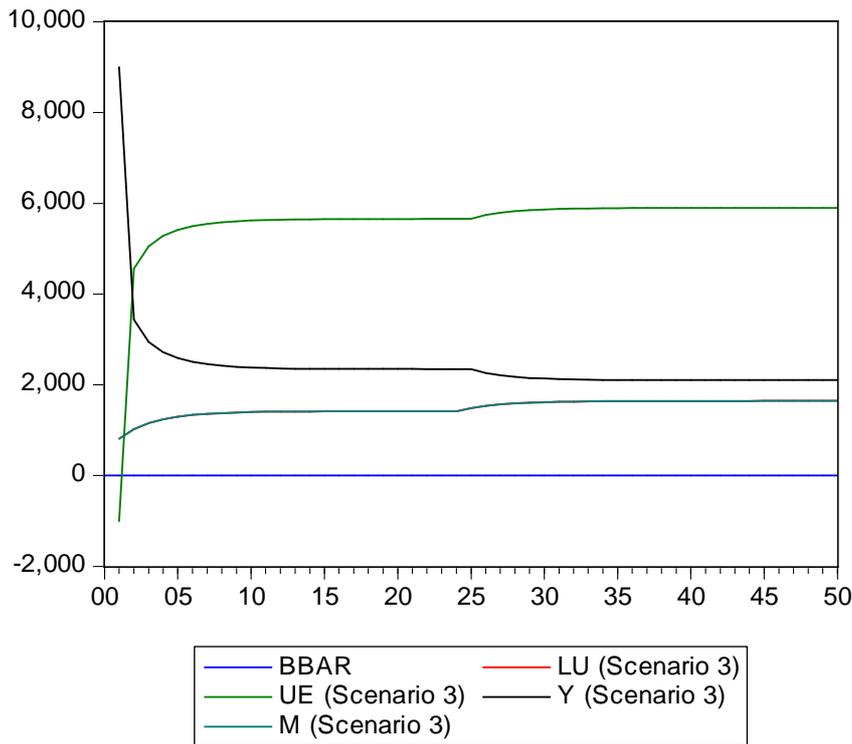
Figure 3 - Bank Rate increase



IR = interest paid for reserves (i_R)

The second shock we consider is to the bank rate ($i_R = 0.04$ from year 2025). Here we see how a rise in the cost of reserves is passed on to firms causing them to reduce borrowing, lowering output and employment (Figure 3). Without the constant returns mechanisms this new equilibrium is likely to become established.

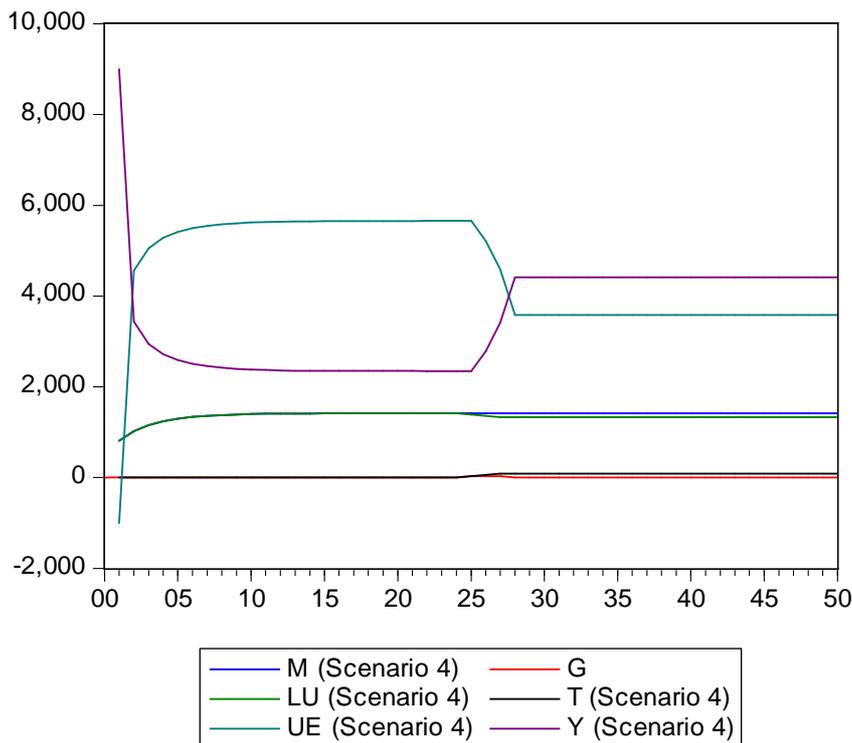
Figure 4 – Increased Money Holding



BBAR = desired level of individual balances (\bar{b})

The third shock is in the form of a rise in individuals' target balances ($\bar{b} = 0.4$ from year 2025). Initially this causes a decrease in firms' revenue leading to losses, unsold goods and an increase in unpaid loans (Figure 4). Once the new target balances are reached a new steady state arises in which firms once more make zero profits. However output and employment are now at lower levels than previously due to the increased level of required reserves and the cost of maintaining these.

Figure 5 – Government Expenditure



G = government expenditure (G_t); T = government liabilities (T_t)

We can simulate the effect of a government expenditure injection by introducing a positive value for G_t . ($G_t = 30$ from 2025-2028) Whether this expenditure is paid to individuals or firms it has the effect of transferring ‘free’ reserves to the banks. Note that in this model government spending has a significant effect at relatively small quantities relative to output in increasing output and lowering unemployment (Figure 5). This is exaggerated by the assumption that no interest is paid by banks on deposits, and the absence of interbank lending. We could envisage that the government either purchases unsold stocks from the firms in a fairly straightforward fiscal intervention, thus making good their unrepaid loans, or pays individuals a ‘job guarantee’ type wage. Against these beneficial effects has to be balanced the need to generate tax liabilities on the monetary authority’s balance sheet for these reserves to have credibility and value.

Figure 6 – Lower Money Holding – Aggregates

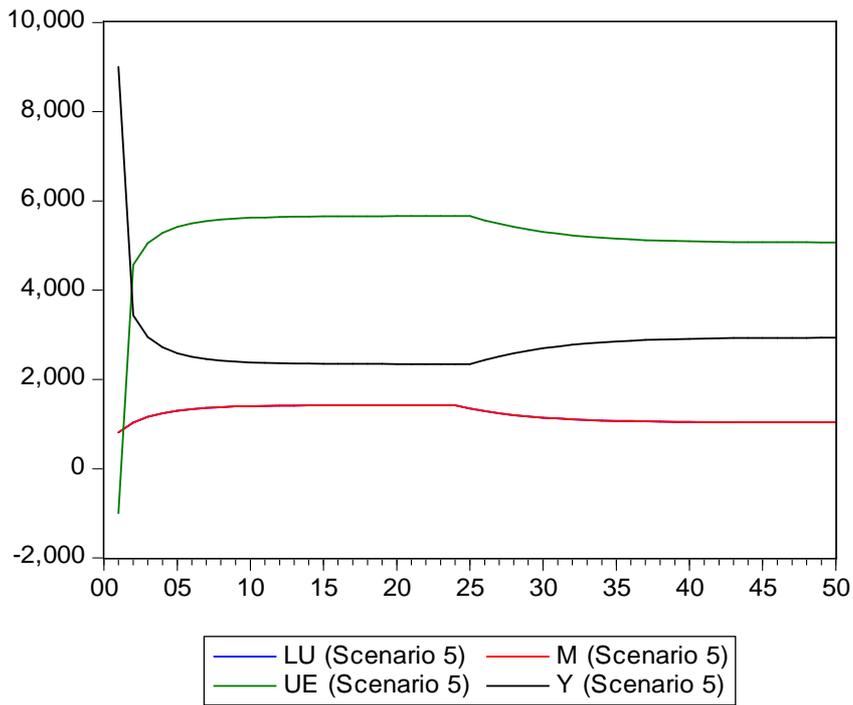
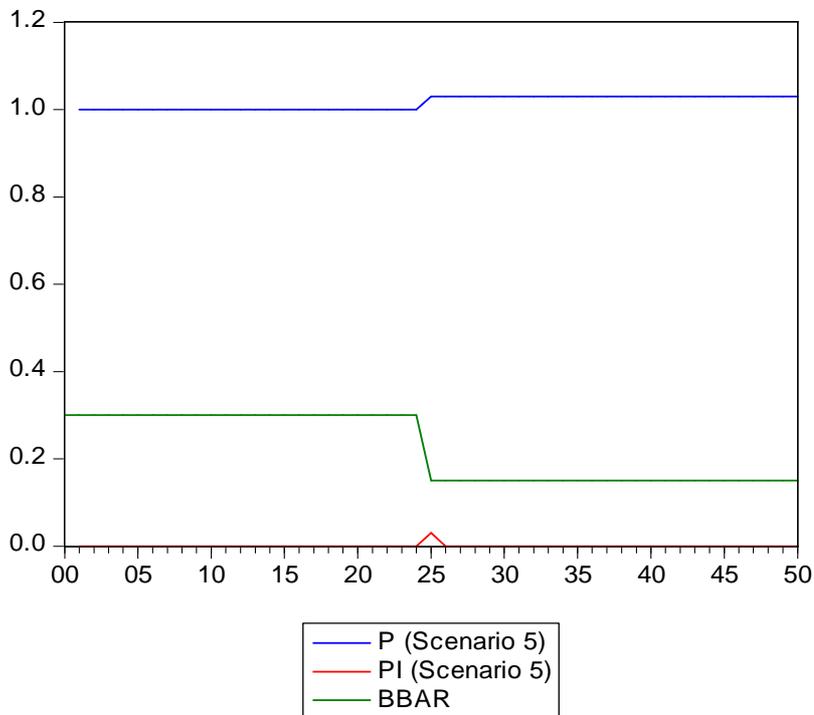


Figure 7 – Lower Money Holding – Price Levels

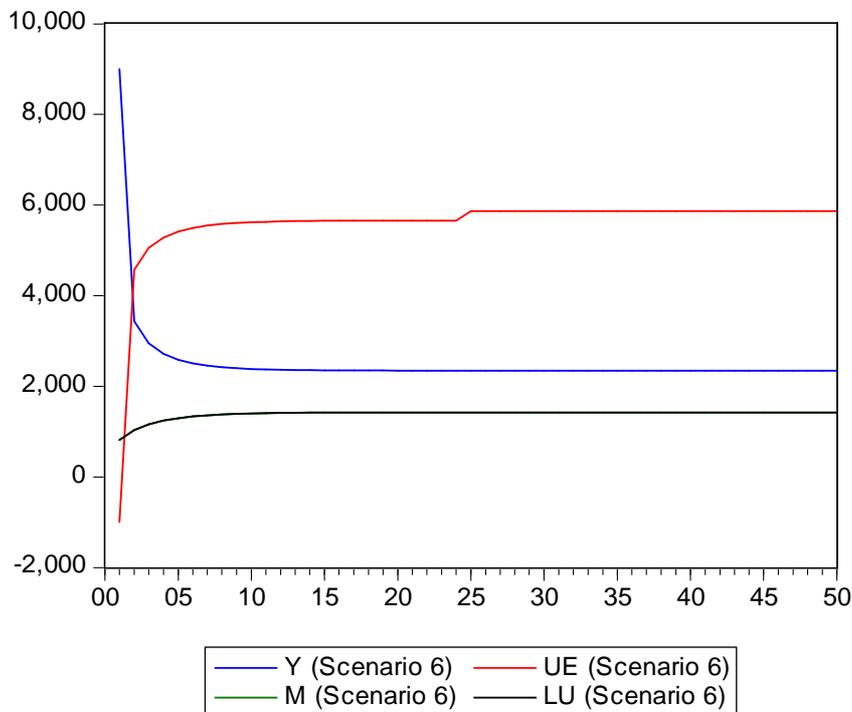


P = price level (p_t); PI = inflation (π_t)

The reflux of money from balances and government expenditure also introduces the possibility of purchasing power exceeding the expected value of output with the potential for inflationary consequences. We demonstrate this with a scenario where $\bar{b} = 0.15$ from year 2025. Figure 6 shows the long-run aggregate effects of increased output and employment as a consequence of the lower reserve costs. Figure 7 shows the initial inflationary impact. Clearly the dynamics of the adjustments here will determine whether nominal or real changes are predominant.

In this case we can see that since increasing interest rates and fiscal withdrawal can have the reverse effects they can be used as policy to affect the impact of the other shocks.

Figure 8 – Wage Increase



The final scenario we introduce is, unlike the others, is not a directly monetary scenario. If there is a wage increase in this model, we come up against the loan restriction determined by 'animal spirits' if any and the interest charge levied by banks. If we take the loan restriction as a nominal limit, then in the absence of any productivity increase accompanying the wage increase, while nominal output and demand will be constant, real output and employment will fall. This scenario is shown for nominal output in Figure 8. If we take the loan limit as being a real value, implying that its nominal value can increase to accommodate the wage rise, then no real output or employment fall results.

Conclusion

Unemployment in modern capitalist economies with deposit money has a complex mixture of moral, social and economic aspects. The main purpose of this paper has been to outline a realistic understanding of the causes of unemployment in such an economy and evaluate the solutions that have been put forward. Unfortunately there are no easy solutions that do not require political commitment and risk. It is probable that the only potential solution without long-run costs involves a direct attack on the structure of firms with greater sharing of responsibility and revenue as first argued by Martin Weitzman in 1982.

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