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**PRICE FLEXIBILITY AND FULL EMPLOYMENT: A COMMON
MISCONCEPTION**

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Price flexibility and full employment: a common misconception¹

ABSTRACT

This paper highlights and builds upon Michio Morishima's sadly neglected thesis that multi-market economies should be envisaged, and modelled, as over-determined systems, in that the number of conditions to be satisfied for equilibrium exceeds the number of unknowns (equilibrium prices and quantities) to be discovered. This understanding undermines the comfortable supposition (underpinning both New Keynesian and New Classical theoretical approaches) that, even when the economy is not in a position of full employment, a potential equilibrium solution does exist which - if not instantly, at least eventually – will be achieved by market forces. In other words, contrary to the conventional view, observed price and wage stickiness should be considered as contributing to macroeconomic stability rather than inhibiting adjustment to full employment equilibrium. A further casualty of the Morishima perspective is the common textbook rationalisation that the Keynes theory applies only in the short run (with sticky prices) while the classical analysis comes into its own (with flexible prices) in the longer term.

KEY WORDS:

PRICE FLEXIBILITY; GENERAL EQUILIBRIUM (MACRO) MODELS;
WALRAS' LAW and SAY'S LAW; OVER-DETERMINED SYSTEMS

JEL CLASSIFICATION:

E11, 12, 13 and 31

¹ This note replaces an earlier attempt by the author to deal with the same matters (*Strathclyde Papers in Economics*, 2004-07). He wishes to record his appreciation of comment and advice from Eric Rahim and Darryl Holden. However, as advice was not always taken, the author alone is responsible for whatever deficiencies may be detected in this paper.

Introduction

Much modern macroeconomic analysis of unemployment seems to be conducted on the presumption that unemployment, or more specifically the persistence of unemployment, can be understood as indicating a failure of the price mechanism – failure in that, due to stickiness or rigidity of prices and money wages, potentially equilibrating adjustments do not occur when needed. In the orthodox literature, such ‘stickiness’ – understood as reflecting agents’ slowness making required adjustments to money wages or prices - is attributed all sorts of factors, for instance: uncertainty as to the behaviour of other agents, the costs or bother of making such changes, constraints imposed by existing contractual arrangements, confusion (‘misperceptions’) about what is currently happening to prices, inappropriate expectations as to inflationary prospects. The object of this paper is to consider the validity of the presumption that, in accounting for anything other than instantaneously self-correcting macroeconomic disturbances, price stickiness is the villain of the piece.

An unquestioned supposition

While Keynes himself did not approach the problem of unemployment along such lines, neoclassical theorists - after as well as before 1936 – were (one might say) ‘intellectually programmed’ to interpret economic maladjustment in these terms: accordingly they sought to identify price changes which ought to be able to return the economy to full employment. In pre-*General Theory* days standard diagnoses of cyclical downturns or persistent depression highlighted deviation of the money rate of interest from its ‘natural’ value, or excessively high real wages, as indicative of price changes needed to remove obstacles to increased employment.

Even in the post-war heyday of Keynesian economics theorists of a neoclassical bent attributed persistence of depression conditions to downward inflexibility of money wages and prices. A familiar line of thinking was to blame money wage and price rigidities for preventing the price level from falling; the contention was that a general deflation of prices could boost aggregate demand via the ‘Keynes effect’ or (in the last resort) the ‘Pigou effect’. This argument was often put pretty crudely, implying that if prices could be pushed down to a

sufficient extent, the elimination of unemployment would then pose no problems.² More perceptive theorists however appreciated that a deflationary process might very well - with the real burden of debt increasing, and agents cutting spending in anticipation of further price falls - induce a perversely negative, rather than positive, impact on demand. But all parties to the discussion, even if holding differing views about the practical relevance of the wealth effect, would presumably have agreed that *some* level of prices – provided that level could be reached - would imply full employment.

Other writers focused on ‘incorrect’ relative rather than absolute money values as the cause of trouble. Axel Leijonhufvud (1968) for instance, harking back the old money-rate / natural rate conception of an ‘interest rate mechanism’ (believed to ensure – at least if working properly - that all savings out of full employment income flowed to investment), argued that the source of macroeconomic maladjustments lay in the rate of interest getting stuck at an inappropriate value, so preventing the supposed equilibrating mechanism from doing its job. Robert Clower (1965), also directing attention to relative values, proposed the thesis that, when, under disequilibrium conditions, trade takes place ‘at false prices’, agents are prevented from carrying out planned sales and purchases. Expenditures – potentially consistent with full equilibrium – are frustrated, and as a result the actual signals transmitted by market forces cannot produce equilibrating adjustment. His illustration ran in terms of money wages being out of line with commodity prices, implying a constraint on employment which limited consumer spending, so that intended demand remained ‘notional’ rather than ‘effective’.

The ‘trade at false prices’ discussion, while undoubtedly relevant to understanding how the system – how a Keynesian system - works under disequilibrium conditions, was nevertheless, it would seem, conducted under the assumption that a full employment equilibrium set of values did assuredly exist: the question was - without the help of the Walrasian auctioneer - how long would it take to find that equilibrium? That the problem, from that point of view,

² As Gordon (1990) (emphasis added) sees it, slowness of price adjustment is the problem: ‘The essential feature of Keynesian macroeconomics is the absence of continuous market clearing. Thus a Keynesian model is by definition a non-market-clearing model, *one in which prices fail to adjust rapidly enough to clear markets* within some relatively short period of time. Common to almost all Keynesian models is the prediction that in response to a decline in nominal demand, the aggregate price level will decline less than proportionately over a substantial time period, during which the actual price level is above the equilibrium price level consistent with the maintenance of the initial equilibrium level of real output’.

concerns the *stability* rather than the *existence* of equilibrium is indicated by the following passage (Barro and Grossman, 1971, p39):

The auctioneer-recontracting model, which is historically associated with Walras (1874) and Edgeworth (1881), is not the only possible rationalization for neglecting quantity determination under non-market-clearing conditions. Alternatively Marshall (1890) regarded all price adjustments as being nearly instantaneous responses to momentary discrepancies between quantities supplied and demanded. . . . However, the Marshallian paradigm, like the Walrasian paradigm, does not account for such phenomena as the involuntary unemployment of depressions or the shortages which characterize suppressed inflations. Both of these phenomena seem to reflect the persistence of non-market-clearing prices, and their obvious empirical importance suggests that, in contrast to Marshall, we must view the process of adjustment to market-clearing prices as taking a significant amount of time.

Again, on the theme of the supposedly deleterious effects of wage and price stickiness, consider the implications of the popular AD/AS model. According to that conception deviations from full employment (i.e. from the 'natural rate') are associated with the 'wrong' values both of the price level and of money wages in relation to commodity prices. Slow wage and price adjustment is said to be responsible for (in terms of the diagram) a non-vertical short-run AS curve; in other words, with sticky wages and prices spending disturbances impact not just on the price level, but - for as long as prices and wages fail fully to adjust - on employment and output as well. Here again, the presumption clearly is that departures of employment from its 'natural' level occur only because the actual prices in the market do not continuously correspond to their 'proper' (equilibrium) values. And of course the more extreme New Classical theories predict that with full flexibility of prices and money wages the economy can be expected to cleave to the natural rate of unemployment pretty well continuously even despite changes in the volume of spending.

Given the widely-held faith in the efficacy of price adjustment, it is not surprising that price stickiness is commonly identified as the key feature of the Keynes theory, understood as responsible for the fact that disturbances of aggregate demand result (in the short run at least) in changes in output and employment, rather than simply in prices. A number of eminent

contemporary macro-theorists evidently subscribe to this view. Thus for instance Laider (1986):

Sticky prices lie at the very heart of Keynesian macroeconomics, and it explains quantity fluctuations in goods and labour markets as equilibrating movements arising because prices do not immediately change when aggregate demand shifts. [By contrast] the postulate of price flexibility lies at the centre of new-classical economics. It has it that prices always move to equilibrate markets when demand shifts . . .

The same conventional wisdom is expressed by Ball, Mankiw and Romer (1988):

According to the Keynesian view, fluctuations in output arise largely from fluctuations in nominal aggregate demand. These fluctuations have real effects because nominal wages and prices are rigid.

In similar vein, Blinder (1988):

According to Keynesian theory, changes in aggregate demand, whether anticipated or unanticipated, have their greatest short-run impact on real output and employment, not on prices . . . Keynesians believe that goods markets and, especially, labour markets respond only sluggishly to shocks, i.e. that prices and wages do not move quickly to clear markets.

Recently, the (so-called) ‘New Keynesian School’ (taking price stickiness to be a critical factor in accounting for Keynesian disequilibria) have made it their business to explain why, as observed in reality, prices and money wages seem slow to respond to changes in market conditions. ‘Menu costs’ for example, are said deter adjustment of posted prices. From the New Keynesian perspective, if, in the face of a disturbance, prices remain unaltered, quantities may change unnecessarily. Macro disequilibrium is associated with the various behavioural and institutional factors which influence price and wage setting behaviour in such a way as to discourage agents from making the ‘proper’ equilibrating changes called for in a particular situation. The rationale underlying this research project is evidently the belief that slow adjustment of prices and wages reduces the efficiency of the price mechanism, with

consequent costs to the community. The implication must therefore be that, possessed of a better-functioning price mechanism, ‘proper’ values would more readily be established and the macro-economy would exhibit greater stability.

As a final illustration of just how firmly embedded in conventional macroeconomic thought is the idea that stickiness of wages and prices is what prevents the ‘proper’ response of the macro system to disturbances of aggregate demand, we note that mainstream macro textbooks typically explain the difference between Keynesian and classical theories in terms of differing assumptions with respect to wage and price flexibility: Thus, for example:

The classical supply curve is based on the belief that the labour market works smoothly, always maintaining full employment of the labour force. Movements in the wage are the mechanism through which full employment is maintained. The Keynesian aggregate supply curve is instead based on the assumption that the wage does not change much or at all when there is unemployment, and thus that unemployment can continue for some time . . .

(Dornbusch and Fischer, 1990, p.225)

We can now see the key difference between the Keynesian and classical approaches to the determination of national income. The Keynesian assumption . . . is that the price level is stuck . . . The classical assumption is that the price level is flexible . . . The price level adjusts to ensure that national income is always at the natural rate. The classical assumption best describes the long run . . . The Keynesian assumption best describes the short.

(Mankiw, 1994, p.275)

All the hypotheses and interpretations cited above are, it is evident, based on the supposition that, in any situation, a set of *potential* equilibrium values actually exists, and that the emergence and persistence of situations of macroeconomic disequilibrium is attributable to failure of the market mechanism actually to generate that set of equilibrium prices, or to the system’s inability to generate these prices without inordinate delay. But – and this is the point of the present paper - we must ask: is wage and price flexibility really the crux of the matter? *Is it necessarily the case that a greater degree of wage and price flexibility than actually*

characterises a typical modern economy would ensure the more efficient maintenance of satisfactory levels of output and employment?

The question not asked

For greater wage and price flexibility to produce the beneficent results evidently in many quarters anticipated with confidence, two conditions are required. To guarantee the desired outcome it is necessary (1) that an equilibrium set of relative values (i.e. values consistent with full equilibrium of the economy, with demand equal to supply simultaneously in all markets, including the labour market, across the economy) does actually exist (the *existence* of equilibrium issue); and (2) that, from a state of disequilibrium, market forces are capable of generating, via price adjustment, that equilibrium set of values (the issue of *stability* of equilibrium). The other side of the coin, of course, is that unless a potential solution does actually exist to be found - and market forces are, in the real world, capable of finding that solution - the free flexibility of wages and prices would more likely bring constant instability of values and quantities, rather than smooth adjustment to full employment equilibrium.

It is with the *stability* issue that macro theorists, such as those to whose ideas we have made some reference, have been concerned. Whether they had in mind problems in respect of relative values or the price level, attention has been directed to instances of what are seen as inadequate price adjustment; at the same time it is simply taken for granted that ‘correct’ values (values consistent with full equilibrium) actually do exist. We believe this is too casual a dismissal of the existence issue. It is therefore on the neglected question of the *existence* of equilibrium that this discussion will now focus: does, we ask, a solution in the form of a set of equilibrium relative values always necessarily *exist* to be found via price adjustment? The argument we develop, casting doubt on the reliable existence of an equilibrium solution, derives from work by the distinguished Japanese economist Michio Morishima, who reviewed (1977), with interesting results, the implications for our understanding of the Walrasian general equilibrium system of the Keynesian theory of effective demand. Unfortunately, his original and important contribution does not seem to have been given due attention in the mainstream literature.

Let us try to see what Morishima was getting at. We (initially) employ a simplified Walrasian-type general equilibrium model. (It will be recalled that contemporary neoclassical

economists— one would imagine, pretty much without exception - look to the Walrasian system as the most appropriate conceptual representation of an economic system.)

Before we deploy our Walrasian model, it may be useful to explain what is meant by ‘Walras’ Law’. This well-known proposition plays a key role in Walras’s solution of the existence (of equilibrium) issue. The conditions of equilibrium of a multi-market economic system are represented by set of simultaneous ‘excess-demand’ equations, one equation for each market. Satisfaction of these conditions requires the establishment of a set of prices at which all markets are simultaneously in equilibrium – i.e. a set of prices such that demand equals supply (i.e. excess demand equals zero) throughout the economy. Walras handled the question of whether such a solution can be expected to exist by the procedure of ‘counting equations and unknowns’. To be (reasonably) sure that a solution exists we need to have the same number of independent determining conditions as unknowns. Consider the case of an economy comprised of n markets. If there are n markets we have (when one price is set at unity as a numeraire) $n-1$ relative values to be determined. At the same time we apparently have n excess demand equations with which to determine the $n-1$ relative values. Thus we encounter a problem: if the number of conditions to be met exceeds the number of unknowns the values of which are to be established, the simultaneous equation system is ‘over-determined’; if so, it is unlikely that a set of values simultaneously consistent with all of these conditions actually exists. This is where Walras’ Law comes to our rescue. According to Walras’ Law, if we specify n XD conditions of equilibrium for an n market economy, one of these conditions is implicit in the others: we in fact therefore have only $n-1$ *independent* conditions.³ Thus, with Walras’ Law, no problem – the number of independent equilibrium conditions ($n-1$) and of unknowns ($n-1$) is the same. It is therefore reasonable⁴ then to suppose that a set of values consistent with equilibrium across all n markets does exist.

³ The rationale of the Walras’ Law proposition is as follows. When an agent engages in exchange on the market, the value of what is acquired from the market (*demand* for goods or assets), limited of course by the agent’s budget constraint, must equal the value of what, to pay for acquisitions, is disposed of to the market (*supply* of goods or assets); thus the total value of demand of all agents across all markets within the economy must be equal to the total value of supply (though, within individual markets, there may exist excess demand or excess supply). If, across all markets, overall demand \equiv overall supply ($\sum XD \equiv 0$), and demand-supply conditions in every market but one are specified, the demand-supply situation in that last market is implicit. That is to say - *if there are n markets within the system, market conditions being described by n XD equations, only $n-1$ of these equations are independent.*

⁴ ‘Reasonable to suppose . . .’: While Walras himself may have taken equality of number of unknowns and independent conditions as *proof* of the existence of a solution, that is too strong a supposition. C F Christ (quoted in Johnson, 1971, p.107) explains: ‘[If, with more equations than variables, the equations are linear and independent, they cannot be consistent.] If the equations are linear and inconsistent . . . then there is no solution. If the equations are not all linear, no general statement can be made’. As Johnson (1971, p.103) remarked ‘we

Our illustrative Walrasian system - of a macroeconomic character ⁵ - is made up of 5 markets - markets for consumption goods (C), capital goods (K), bonds (B), money (M) and labour (L). With prices expressed in terms of money (the numeraire) the system contains 4 unknowns - the money values of consumption goods, capital goods, bonds and labour. At the same time, by Walras' Law 4 independent XD conditions are available to determine these unknown relative values. All seems straightforward - with an equal number of independent determining conditions and unknowns, we may expect a market-clearing set of prices to exist; further, assuming the absence of any (stability) difficulties in establishing these prices, we take it that the economy naturally tends to a state of full employment equilibrium.

By Walras' Law, as we have said, we can omit one market from explicit consideration on the understanding that conditions there unambiguously follow from the conditions in the other markets. For instance: if $XD = 0$ in the C, B, M and L markets, by Walras' Law $XD = 0$ also in the K market. That of course is just what we would expect: if we know that the situation is one of full employment ($XD_L = 0$), and that the consumer goods, bond and money markets are also in equilibrium, we would naturally presume that the capital goods industry was operating at full capacity. In that situation equilibrium in the goods markets is matched by equilibrium in the labour market: conditions of product demand are fully consistent with conditions of labour supply.

Try another exploitation of Walras' Law. Suppose this time we know $XD = 0$ in the K, C, B and M markets; Walras' Law tells us that, in the L market (the *n*th market) XD should also be equal to zero. But *must* that be so? Certainly, if we make the assumption that aggregate demand is 'tame' (in other words that Say's Law ensures sufficient overall demand for output

have [therefore] to abandon the confidence of Walras for the much less certain hope that there is a unique solution'. Patinkin (1965, p.37) provides practical advice on coping with this state of affairs: 'Now, equality between the number of unknowns and the number of independent equations is neither a necessary nor a sufficient condition for the existence of a solution. Nor does it ensure that solutions, if they do exist, will be only finite in number. For our purposes, however, these highly complicated issues can be ignored. . . . [W]e shall accept such equality as justifying the reasonableness of the assumption that one and the same (unique) set of money prices can simultaneously create equilibrium in each and every market'. (Emphasis added.)

⁵ Our formulation of a macro version of the Walrasian system accords with Weintraub (1974), p.15: 'In a real sense, macroeconomics is general equilibrium theory with some of the many markets grouped together for expositional clarity and convenience. In a general equilibrium schema of about 80,000 markets describing the behaviour of all prices in an economy, perhaps the first 40,000 markets are for consumer goods, the next 20,000 for capital goods, with 10,000 for labour services, 10,000 for financial assets, and a few for money. Combining markets for similar goods there is 'merely' the problem of five markets: consumer goods, investment goods, labour services, financial assets and money'.

to justify the full employment of labour) it will be the case that equality of demand and supply across the product markets will reliably be associated with full employment in the labour market. But consider the following scenario. We abandon Say's Law and allow the demand for investment goods to vary freely in accordance with (an exogenous determining factor) the state of business confidence. Suppose that confidence slumps and demand collapses in the capital goods market. As a result activity falls throughout the system and demand-deficient (i.e. involuntary) unemployment emerges. But note what happens as the economy adjusts to a new position of unemployment equilibrium, with production adapted to lower levels of demand both for capital goods and consumption goods and excess transactions balances absorbed into idle holdings: in this new situation, $XD = 0$ in the K, C, B, and M markets, but in the labour market $XD < 0$ (the supply of labour on offer exceeds the demand from employers). This state of affairs is inconsistent with Walras' Law – the overall sum of XD across the economy is not equal to zero – it is less than zero.⁶ Nor is it now the case that the condition of the labour market is given by the fact that $XD = 0$ in all the other markets of the system.

What does this situation imply? It means that, as the equilibrium conditions that apply to the K, C, B and M markets evidently no longer take account of everything that determines conditions in the labour market, in order to have a *comprehensive* description of the state of the economy we must specify *explicitly* the conditions of equilibrium in *all markets*. In other words, to model this 5 market system without depending on Say's Law to keep aggregate demand in order, we need to specify 5 independent equilibrium conditions. And, of course, when we have 5 independent conditions and (still) only 4 unknowns the system is *over-determined*: there is then no certainty of the *existence* of an equilibrium set of relative values. In these circumstances it is very unlikely that full flexibility of prices will help in achieving equilibrium – it is most probably the case that a potential equilibrium solution (an equilibrium set of prices) does not exist to be found. The basic explanation for want of such a solution is that the parameters of the system (particularly conditions of labour supply, and the state of business confidence) happen – at least currently – not to be compatible. Prices could go on altering continuously without ever establishing equilibrium within the economy: with regard to the attainment of equilibrium, price flexibility is, quite simply, beside the point.

⁶ Compare Leijonhufvud (1968), pp.85-88.

Following Morishima, we have so far discussed his thesis of the possible non-existence of a market-clearing solution with reference to the Walrasian general equilibrium system. But that may not be a particularly appropriate way of looking at the issue: after all, it is arguable that the Walrasian system is not the most suitable conceptual framework in terms of which to investigate the implications of Keynes's theory of effective demand. Despite all that Keynes had to say against 'classical economics'⁷ it is, ironically, probably fair to say that the *General Theory* fits far better into a classical framework – *a la* Adam Smith – than into the neoclassical general equilibrium model. Keynes sought to understand, just as did the classics, the functioning of an economic system capable of saving and capital accumulation, which operated, within historical time, in a real world with recognisable institutional features.

We wish now to make the point that the Morishima thesis of the possible non-existence of equilibrium solution need not be uniquely associated with the Walrasian system. We suggest that an alternative representative economy, modelled in classical terms, could with equal probability be subject to an identical problem. There is no reason to doubt that in a classical world – absent the assumption that, through Say's Law, aggregate demand is 'tame' – the same fundamental inconsistency may emerge between, on the one hand, conditions of labour supply, and on the other, the readiness of potential purchasers actually to buy the whole amount of output the economy is capable of producing.

To make this argument we now introduce a simple model of classical (Sraffian) character⁸. We suppose that the economy with which we are concerned – a surplus-producing system – is comprised of n industries. Certain technological (input-output) relationships are taken as given, and (for simplicity) it is further assumed that short-run supply curves are horizontal. We suppose too that distribution of income is exogenously settled so that labour (we assume homogeneous, 'abstract' labour) earns a pre-determined real wage. Installed industrial capacity is such that, when that capacity is (by some normal criterion) fully utilised in production, the demand for labour just matches the quantity of labour available for employment. We take it that there is a given, fixed supply of nominal money;

⁷ Keynes was of course focusing narrowly on the classics' espousal of Say's Law.

⁸ 'Classical' as distinct from 'neoclassical' – i.e. of a Smithian rather than a marginalist character. We are not, it must be understood, attributing to Sraffa any analysis of issues of macroeconomic stability: it was on quite other matters that his attention was focused. All we are doing here is borrowing his basic framework in order to construct a simple representation of a classical (surplus-producing system) to be set against the correspondingly simple Walrasian one.

Let us now enumerate the unknowns within the model, the values of which have to be determined, and identify at the same time the independent determining conditions which have to be satisfied for the establishment of equilibrium. We find the following:

We have n price-cost conditions (reflecting the input-output structure of the economy) to the effect that, for equilibrium, each industry's sales proceeds must just cover production costs (i.e. costs of materials and labour, together with a 'normal' return on capital). The solution to these equations constitutes the set of 'natural values' (the relative cost-of-production prices) of the n goods produced. In addition, a set of excess demand conditions (requiring that XD equals zero simultaneously in all markets (in the n commodity markets, the money market and the labour market) fixes, (with the equilibrium relative *prices* of all goods already determined by production costs, and the price of labour exogenously given) the *quantities* of commodities and labour traded in these markets; in equilibrium quantities demanded and supplied in the commodity markets are such that current market prices equal 'natural' values. Satisfaction of the condition that XD for money is absent means that with a given stock of nominal money, and with relative prices quoted in terms of money, the general price level is determined.

Let us count the numbers of unknowns and independent conditions of equilibrium. The model contains the following unknowns: n quantities of various goods produced, the n (natural) prices of these goods in terms of money, the quantity of labour employed and the real wage rate. The number of unknowns is $2n + 2$. At the same time we have the following independent conditions which, for equilibrium of the system, must be satisfied: n price-cost conditions, $n + 1$ *independent* XD conditions (which, by Walras' Law, cover conditions across n commodity markets, 1 labour market and 1 money market), and one exogenously-specified rate of real wages. The number of independent equations is thus $2n + 2$.

If we ask the same questions of this model as we asked of the previous Walrasian system, the answers turn out to be exactly the same. We again find that if aggregate demand is 'tamed' by the assumption of Say's Law, we have an equal number of unknowns and independent determining conditions, allowing optimism about the probable existence of an equilibrium solution. If, on the other hand, we drop the Say's Law assumption, we again find that the number of determining conditions exceeds the number of unknowns, and the existence of a full employment, market clearing solution is called in question.

To elaborate: with regard to the initial specification of the classical model, Walras Law was invoked to eliminate one of the $n+2$ XD conditions (relating to the $n+2$ markets) as redundant. This left a total of $2n+2$ independent conditions to determine $2n+2$ unknowns. Just as in the case of the neoclassical model, at first sight everything in the garden looks lovely – it seems that we can bank on the existence of an equilibrium solution. But, as we found with the neoclassical model, things may not be quite what they seem.

We could go through the same exercise with the classical model as we did with the neoclassical one – observing that for Walras Law to be valid in all circumstances, it was necessary that AD be ‘tamed’ through the adoption of Say’s Law – tying aggregate demand to labour supply conditions. The introduction of an independent investment function has exactly the same impact on each system – it means that investment demand, and consequently aggregate demand, is freed from dependence on the supply of labour as implied by (the tacit) acceptance of Say’s Law. In the case of the classical model, just as with the neoclassical one, by dropping the Say’s Law assumption and allowing commodity demand to vary independently of conditions of labour supply, the possibility is introduced that, with aggregate demand insufficient to justify full employment, a situation can develop that while $XD = 0$ across all markets other than the labour market, XS nevertheless exists at the same time in the labour market. (Contrary to Walras’ Law, there is then net XS across the economy). So, just as we found it necessary to amend the neoclassical model to allow it to comprehend ‘non-Say’s Law’ situations, so we need to amend the specification of the classical model. This again means the abandonment of Walras’ Law. By including an independent aggregate demand function (or more narrowly, independent demand for investment goods) we then specify for the classical model a total of $2n+3$ independent conditions to determine $2n+2$ unknowns. Thus, when an independent AD function is included in the classical model, we find – as we found before with the Walrasian model - the system to be over-determined. It may very well be that no equilibrium solution exists⁹.

⁹ It should be noted that, given the way in which our representative classical system is set up, there *is* a difference between the stories pertaining to the two (classical and neoclassical) models; but this difference is not significant. In the Walrasian model the unknowns to be determined by the set of XD equations as requirements of equilibrium are the *prices* in the several markets; in the classical model, given that equilibrium natural values are determined by the technological (input-output) relationships underlying the price-cost conditions for each industry, it is the equilibrium *quantities* (of goods produced and labour employed) that should emerge from the set of XD conditions if a solution is to emerge. What we are saying here is that, with natural values set by technology, when the system is over-determined, no solution – appearing in the form of an equilibrium set of quantities - may exist: quantities demanded (of goods) and supplied (of labour) may be inconsistent. As with the

How come, the common belief in the existence of an equilibrium solution?

Why has so little consideration – except by experts in general equilibrium theory – been given to the existence question? We suspect that, on the part of those who are not specialists in this particular field, it has been too readily supposed that no problem exists – that the Walrasian theory of general equilibrium takes care of the issue, and that a comfortable answer can be taken for granted. We need to go back to Walras on this.

Questions of the existence (and stability) of general equilibrium of a multi-market economic system were posed for the first time by Walras, and it is essentially on an unsophisticated and uncritical adoption of his solution that modern faith in the existence of an equilibrium set of values – such as underpins the sort of macro analyses we discussed at the beginning of this paper – would seem to be based. It does not however appear to be appreciated that – as demonstrated by modern developments in general equilibrium theory - the Walrasian analysis cannot provide that support.

In building up his general equilibrium analysis Walras constructed a series of models of economic systems, models of progressively increasing complexity. It is arguable however that, despite the greater elaboration of the later models, the essence of his developed theory of value is to be found in the basic model. (That, it will be noted, is tantamount to saying that, as a theorist of general equilibrium, Walras was never able to escape from the limited world of his simplest model.) Walras's introductory model is one of exchange (no production involved), set on a desert island. The several 'Robinson Crusoes' on this island, each finding him/herself with an arbitrary endowment of goods (saved from shipwreck, washed ashore or growing wild) set up a market place on the beach which provides an opportunity for individuals to exchange the goods they happen to possess for others they prefer to have. Question: can a set of commodity prices exist at which all the individual commodity markets simultaneously clear? Walras's answer is of course that, with n goods traded, in n markets, there are $n-1$ relative values (in terms of one good chosen as numeraire¹⁰) and – by Walras'

Walrasian model, there may be no equilibrium solution and flexibility of prices (free variability of current *market* values in response to XD or XS) will be of no help in attaining full employment equilibrium.

¹⁰ Note, while relative values are expressed in terms of a numeraire commodity (the price of one unit of which is set at 1) the system contains no money as such, no medium of exchange, no liquid store of value. Even if more

Law – n-1 independent excess demand conditions to determine the n-1 relative values. Thus Walras affirms the existence of an equilibrium set of values.

This affirmation, on the basis of there being an equal number of determining conditions and unknowns, remained for Walras a foundation stone of his analysis. And, as we have suggested, faith in that proposition – based on the same rationale (or just simply taken for granted) – underpins much present day macro theorising. The point we wish to make is that while, in the desert island context, it is perfectly plausible to suppose we are dealing with a ‘closed’ system to which Walras’ Law applies, it has not been adequately understood that when the analysis is applied to a wider world the simple certainties of the desert island can no longer be taken for granted.

On the desert island, Walras’ Law - and with it the existence of a determinate solution (set of equilibrium relative values) – must hold true. If agents, on any going terms of exchange, swap one good for another, then the value of each individual offer and acquisition must tally, and so also must the total value of demand over all markets be equal to the total value of supply. In the supposed context, there are no circumstances in which this identity does not hold – i.e. $\sum XD$ must indeed $\equiv 0$. But, the question we need to ask is: what conditions ensure that that is so? The simple answer is that, under desert island conditions, the identity must hold because agents have no option, if they enter the market, but to exchange one good for another: – there is no possibility of a seller not buying something of equal value in exchange. Supply of goods *is* demand for goods: the system is ‘closed’ in the sense that every act of goods supply implies a corresponding act of goods demand. *There is no way whereby the value of what is received in exchange can ‘leak out’ of the market without constituting an offer for other goods of equal value.*

This scenario may be all very well with respect to the hypothetical desert island, but is of little relevance as a guide to what can happen in the real world. As we have already noted, in conditions of uncertainty, agents may choose not to exercise purchasing power they possess or have access to, preferring the security of safe (non-produced) assets, or indeed the safety of standing back from active market involvement. In their efforts to prove the necessary *existence* of an equilibrium set of values which simultaneously clears all the markets of a

sophisticated versions of the Walrasian system do include money, that situation implies no threat to macroeconomic stability when aggregate demand is tamed by resort to Say’s Law.

multi-market economy, modern practitioners of general equilibrium analysis have been forced into adopting wholly unrealistic assumptions. Indeed, it is not only with respect to general equilibrium analysis, but equally in much modern macro theorising, that reliance is placed upon extremely questionable suppositions. One such assumption is that insurance can be taken out against any conceivable contingency ¹¹(thus obviating the incentive to withhold spending and seek security in liquidity); another means of side-stepping uncertainty is to suppose in effect that every event in all time to come is knowable (and known).¹² These desperate theoretical measures demonstrate just how difficult it is to translate to the real world the optimistic Walrasian conclusion – derived from the desert island scenario - of the assured existence of equilibrium.¹³

In other words it is uncertainty (completely absent from Walras's desert island) - and with it behaviour in the face of uncertainty – that undermines confidence in the necessary existence, in all circumstances, of an equilibrium set of relative values. Hahn (1982) makes just that point. He points out that the existence of irreducible uncertainty means that a complete set of markets, such that the entrepreneur can (through insurance) eliminate all possibility of loss, will not exist. The consequences are serious:

[I]f the invisible hand is to operate there must be sufficient opportunities for intertemporal and contingent intertemporal trade. . . . The lack of contingent markets means that the market

¹¹ 'The most influential New Classical and New Keynesian theorists all worked in what economists call a 'complete markets paradigm'. In a world where there are markets for contingent claims trading that span all possible states of nature (all possible contingencies and outcomes), and in which intertemporal budget constraints are always satisfied by assumption, default, bankruptcy and insolvency are impossible. . . . Both the New Classical and New Keynesian complete markets macroeconomic theories not only did not allow questions about insolvency and illiquidity to be answered. They did not allow these questions to be asked.' (Buiter, 2009)

¹² 'In both the New Classical and New Keynesian approaches to monetary theory (and to aggregative macroeconomics in general) the strongest version of the efficient markets hypothesis (EFM) was maintained. This is the hypothesis that asset prices aggregate and fully reflect all relevant fundamental information, and thus provide the proper signals for resource allocation. Even during the seventies, eighties, nineties and noughties before 2007, the manifest failure of the EFM in many key asset markets was obvious to virtually all of those whose cognitive abilities had not been warped by a modern Anglo-American Ph.D education. But most of the profession continued to swallow the EFM hook, line and sinker, although there were influential advocates of reason throughout, including James Tobin, Robert Schiller, George Akerlof, Hyman Minsky, Joseph Stiglitz and behaviourist approaches to finance. The influence of the heterodox approaches from within macroeconomics and other fields of economics on mainstream macroeconomics – the New Classical and New Keynesian approaches – was, however, strictly limited.' (Buiter, 2009)

¹³ There is a parallel here: as the 'Cambridge critique' has demonstrated, the Walrasian theory of value, while applicable in the desert island context, cannot be applied in the case of a more realistic model which involves production – production with a surplus. The conclusions of the theory cannot be generalized beyond the simple introductory, but wholly unrealistic, scenario.

economy is associated with more uncertainty than pure theory allows. The lack of intertemporal markets means that great weight must rest on market expectations.

Tobin (1993) notes that Keynes had in mind exactly that want of markets to which Hahn refers¹⁴:

As Keynes explicitly observed, his theory refers to economies with incomplete markets. In his day futures markets were rare, and contingent futures markets even rarer. They are still scarce. As Keynes explained, decisions not to spend now are not coupled with any definite orders for future or contingent deliveries. Typically they result in accumulations of assets that can be spent on anything at any future time. The multiplier effects of lower current spending propensities are not offset by specific and firm expectations of future demands.

In such circumstances the system is, rather than being completely interdependent, ‘open-ended’ in that the outcome (the state of the economy) depends on subjective, essentially independent (‘untamed’) factors. Hahn indeed remarks that ‘Keynes . . . placed great emphasis on the fact that he did not invoke [the complete markets postulate]’.

It is appropriate at this point to recall that Keynes regarded economics as a ‘moral’ science and not a ‘natural’ science – a ‘moral science’ of human behaviour in that, as he put it, ‘it deals with motives, expectations, psychological uncertainties’. If the ‘complete markets hypothesis’ actually accorded with real world conditions - if the uncertainties respecting the returns to be got from investment could be eliminated by forward trading or insurance - then there could never be any case for holding back from investment so long as the physical conditions of production were capable of yielding a profit. But if there is – indeed, *as* there is - no way of ensuring through appropriate arrangements that all possibilities of loss are excluded, then investment must depend on the subjective factors, the expectations, confidence in these expectations, hopes and fears, that inevitably enter into the investor’s decision making. That is why a modern economic system, subject to the influence of such factors – unlike the economy of Walras’ desert island – should be considered an ‘open’ not a ‘closed’ system, one which is immune to inconsistency between conditions of labour supply

¹⁴ See Keynes (1936), Chapter 16, pp.210-213.

and conditions of demand for output – inconsistency implying the over-determination of the system. The limited applicability of Walras's treatment of the existence (of equilibrium) issue needs to be better understood.

Implications of over-determinacy

What are the implications of this possible situation that we have uncovered? If the economic system is, as described, 'over-determined', it means that it may not be possible for market forces to establish a situation such that all conditions of equilibrium are simultaneously satisfied. In other words, there exists an inconsistency within the economy such that, under the given conditions, equilibrium at the same time, across all markets, is unattainable.

The significant implication of the contention that an equilibrium solution may not exist to be found through the free operation of market forces is of course that, with regard to the problem of unemployment, price flexibility is, in the prevailing conditions, beside the point. If an equilibrium set of values and quantities does not exist, prices could go on changing indefinitely without ever yielding up a satisfactory market-clearing solution.

If the system is inconsistent, the problem must lie with its parameters. By the parameters (of the price system) we mean the key factors which – by determining the shapes and positions of demand and supply curves (and excess demand functions) within the markets of the economy – are ultimately responsible for the conditions which prevail within these markets. These parameters include – the technology in use, tastes and wants as embodied in consumers' utility functions; the workforce, its particular skills and capabilities and the terms on which it is willing to work; attitudes of decision makers towards risk and uncertainty (liquidity preference) and their 'state of expectations'; the government's policy stance can also be reckoned a parameter of the system. How can it be that these parameters may in some way be inconsistent with each other – incompatible - so as to preclude the attainment of full equilibrium? What sort of situation is implied?

In pre-Keynesian theory such a possibility – of a parametric problem - was actually envisaged (though not described in these terms); it was considered fairly easily remediable. The old (Pigouvian) explanation of persisting unemployment (Pigou, 1933) was that labour was seeking employment on terms which simply could not be afforded by industry: a general rate

of real wages was being demanded which excluded a substantial proportion of the workforce from the possibility of employment. In other words, it was supposed that *the terms of labour supply* were out of line – incompatible – with the existing conditions of production and employment. Downward rigidity of wages reflected labour’s adherence to a misguided ‘wage policy’ – that is to say, to its insistence on an inappropriate state of the labour supply parameter. The remedy was (notionally) straightforward – that labour be persuaded to alter the terms on which it would accept employment: in other words a *parametric* change was required, which would reconcile conditions of labour supply and of full employment and allow the establishment of a new market-clearing rate of real wages.¹⁵ This Pigou example is relevant in that it illustrates an important general point. While the parameters of an economic system may, at some point in time, be incompatible with the establishment of full equilibrium (as was the ‘wage policy’ of the workforce in the Pigou example), we need not suppose that they are unalterable. Even if, with conditions as they are, a set of values consistent with full employment equilibrium does not exist to be found via the working of the price mechanism, changes in the parameters of the system, spontaneous or policy induced, may make possible a better outcome through modification of the existing conditions of demand or supply.

Let us now move forward to a Keynesian world. Envisage a situation of over-determinacy such that no equilibrium solution exists: if prices are sticky rather than fully flexible we can imagine the economy being ‘stuck’ in a disequilibrium situation, without full market clearing, but with a particular set of prices prevailing. If some relevant parametric change can be engineered – say, by raising business or consumer confidence, and thus altering existing conditions of demand - a better state of the economy may be attained. Even if full market clearing equilibrium is not achieved, the inconsistencies within the system will at least have been reduced. Note that, even if effective intervention, or indeed spontaneous change in expectations and confidence does actually propel the economy to full employment (so that in all markets, including the labour market, $XD = 0$), that does not mean that the system is no longer over-determined: what it does imply is that, although the number of equilibrium

¹⁵ Pigou envisaged the labour supply curve as being of a reverse L-shape: the parametric change of alteration the prevailing wage policy implies a downward shift of that curve, permitting equilibrium of labour demand and supply at a higher level of employment. (See Keynes (1973), Vol. XIV, pp.53-54.) Pigou himself (1933, pp.252-253) with reference to the labour market, clearly distinguishes between price adjustments permitting attainment of equilibrium as given by existing conditions of demand and supply, and the result of an altered ‘wage-policy’, which being a parametric change, shifts the labour supply curve.

conditions still exceeds the number of unknowns, the parametric change has eliminated an existing source of inconsistency – conditions previously incompatible can now be reconciled. We may understand that the altered state of expectations and confidence has brought conditions of equilibrium in the labour market and conditions of equilibrium in the capital goods market into line with each other. (But even if markets throughout the economy happen currently to be clearing at the existing set of prices, there can be no guarantee that parameters will not again change, destroying this full employment balance of forces and depriving the economy of the existing equilibrium solution.

We have argued above that inclusion in a macroeconomic model of an independent investment or aggregate demand function implies over-determinacy in that the number of independent equilibrium conditions exceeds the number of unknowns to be determined. From that perspective, an independent investment function (as in Keynes's theory), not tied to conditions of labour supply, does imply on account of over-determination of the system the possibility that, under the prevailing conditions no equilibrium solution exists to ensure simultaneously full utilisation of available labour along with the chosen volume of investment spending (with investment undertaken up to the point at which the marginal efficiency of capital equals the rate of interest). Demand deficient unemployment can exist. In these circumstances – as we have said – with fully flexible prices and money wages, nominal values could go on changing indefinitely without a return to full employment. Morishima (1977, pp.115-116), comparing the classical and Keynesian visions, describes a Keynesian scenario:

Suppose . . . that Say's Law is true. There exists a neoclassical, full-employment, full-capacity equilibrium. Even in this case if the wage is set [above the full employment level], then no forces work to move the economy towards equilibrium, because of the downwards rigidity of the wage rate. That is to say, the neoclassical equilibrium is prevented from prevailing in spite of its existence. If this were the case, we might ascribe the causes of unemployment to the downwards rigidity of wages and hence to the trade unions. Keynes, however, opposed this view; he believed that the neo-classical full-employment, full-capacity equilibrium does not exist, because investment is determined independently of savings and, therefore, even if the wage is perfectly flexible, the economy cannot settle down at any point because of the over-determinacy. Only

the downwards rigidity stops this endless fluctuation, but is not the cause of under-employment because the removal of it will not lead to full employment. . . . Keynesian unemployment is the particular unemployment which corresponds to that level of savings which equals the level of investment independently determined.

In the given circumstances price flexibility, price adjustments, provide no answer to the problem; indeed (we discuss this below) observed stickiness of prices may actually be beneficial in reducing instability. If that is the situation, and the economy seems to be locked in recession, it follows that, intellectual hand-wringing about price stickiness being a waste of energy, attention would be more usefully directed to identifying the nature of the inconsistency responsible for the currently unsatisfactory situation – i.e. thought should be given to the parameters of the system, the state of which must be responsible for the existing state of affairs. Policy makers, instead of urging price adjustment (wage cuts) should consider what might be done (directly or indirectly) to alter the determining parameters of the system, so as to make attainment of a more desirable state of the economy a feasible outcome. The relevant parameters might well have to do with *confidence* – specifically the problem might lie in the fact that business confidence, and (just as important in the modern world) consumer confidence is so depressed that the volume of planned expenditure is falling far short of what is required for full employment. It is not impossible that by some action – remember Keynes’s ‘pump priming’ – expectations and confidence of potential spenders within the economy may be improved, and recovery got under way. Such a change in outlook – like the change in labour supply conditions in our earlier illustration – would represent a parametric change, with the factors ultimately determining conditions of demand and supply within the economy being altered to become consistent with a better outcome.

The two general points we wish to emphasise (and here reiterate) are, from the policy angle, (1) that while the parameters of the system are such as to render full employment equilibrium unattainable - and with over-determinacy no potential equilibrium set of prices and quantities actually exists - it is cannot be fruitful to hope that the free – or freer - working of the price mechanism must eventually (in Friedman’s phrase) ‘grind out’ a set of values such as to guide the economy to full employment; and (2) that it should be recognised it is through parametric change (for instance, via changes in expectations and confidence, or appropriate

activist policy measures) that improvement may more realistically be anticipated or engineered.

To return to the examples with which this note began, various instances of continuing macro disequilibrium were attributed to the non-adjustment of prices. We can now say that, if we do not trust in Say's Law to ensure an overall balance between demand for output and supply of labour, we must recognise that the system is over-determined, and that consequently, when unemployment exists under depression conditions, it is unrealistic to suppose that the removal of any existing impediments to price adjustment, will 'do the trick' and restore full employment. In these circumstances, the text book proposition (see for example the passages from Dornbusch and Fischer and Mankiw quoted above, pp.53-54) which relates the Keynes theory (sticky prices) to the short run and the (neo)classical theory (price flexibility) to the long run is mistaken and misleading. It is not an appropriate strategy to hope that, with the passage of time, the rigidities affecting money wages and prices will be relaxed, so that, eventually, the free working of the price mechanism will establish equilibrium at full employment.

Consider some of these illustrative cases more closely. Take first the AD/AS model: we have to say that utilisation of this fashionable construction amounts in effect to a return to the pre-Keynes era in which, with tacit reliance on Say's Law, employment is determined in the labour market. There is then no question of the system being over-determined. The matters with which we are concerned in this paper are excluded by (implicit) assumption – price flexibility (given stability) ensures equilibrium. Clower's approach also seems misconceived. He seems to think that because of the constraints imposed on agent's spending plans by 'trade at false prices' commodity prices are not bid up sufficiently relative to money wages. But, from a Keynesian perspective, there is no gain to be had by reducing real wages: the source of the problem of course lies elsewhere with the volume of planned aggregate demand, and the fact that the state of the parameters responsible for that deficient level of demand happens to be irreconcilable with the existing conditions of labour supply. Likewise, in Keynesian terms, Leijonhufvud's concern with a supposed failure of the rate of interest to adjust as required is missing the real point; the point, again, is that the factors which determine aggregate demand have produced a volume of spending inconsistent with the plans of the workforce to earn income through the sale of their labour. With an over-determined system of markets, a market-clearing solution may well not be obtainable. As regards the 'New

Keynesian' analyses of price setting behaviour, we do not read these explanations of slowness in price and wage adjustment as reasons for the non-attainment of full employment equilibrium. If a potential solution isn't actually there to be found, we prefer to interpret the New Keynesian theories as accounting for a recognisable real world phenomenon - price stickiness – a phenomenon which however is *not* in itself responsible for the persistence of unemployment.

In respect of the instances just discussed, we do not believe that a greater degree of price flexibility than actually exists would be advantageous to macroeconomic stability. In fact it is possible to be more positive about inflexibility of prices – to regard such inflexibility not just as a phenomenon which (contrary to neoclassical orthodoxy) doesn't actually do any harm, but as characteristic feature of the economy which is positively beneficial. Such in fact was Keynes's view, as expressed in the *General Theory* (Keynes, 1936, pp.269-270). Thinking of contemporary conditions of depression, he wrote:

[I]f labour were to respond to conditions of gradually diminishing employment by offering its services at a gradually diminishing money-wage, this would not, as a rule, have the effect of reducing real wages and might even have the effect of increasing them, through its adverse influence on the volume of output. The chief result of this policy would be to cause a great instability of prices, so violent perhaps as to make business calculations futile in an economic society functioning after the manner of that in which we live. To suppose that a flexible wage policy is a right and proper adjunct of a system which on the whole is one of laissez-faire, is the opposite of the truth. . . . In the light of these considerations I am now of the opinion that the maintenance of a stable general level of money-wages is, on a balance of considerations, the most advisable policy for a closed system: whilst the same conclusion will hold good for an open system, provided that equilibrium with the rest of the world can be secured by means of fluctuating exchanges.¹⁶ There are advantages in some degree of flexibility in the wages of particular industries so as to expedite transfers from those which are relatively declining to those which are relatively expanding. But the money-wage level as a whole should be maintained as stable as possible, at any rate in the short period.

¹⁶ Keynes presumably had in mind the circumstances of the UK economy in the 1920s after return to the gold standard at an inappropriately high value of sterling: with sticky domestic money wages and prices the country's balance of international trade was highly detrimental to employment at home. Depreciation of the pound was urgently required.

What Keynes had in mind as causing a negative impact on demand under deflationary conditions were (a) the dampening effect of a growing real burden of debt on willingness to spend, and (b) the possibility (further weakening demand) that perception of currently falling prices would lead to expectations of continuing deflation, bringing the fear that returns to economic activity would progressively diminish in value relative to costs incurred. It is entirely possible therefore that, instead of falling prices boosting demand (via a notional wealth effect), the outcome might be that the economy slides into a cumulative deflationary spiral, with collapsing prices and slumping activity. That danger was foreseen by (amongst others) both Patinkin (1965)¹⁷ and Tobin (1993).

Tobin (1993), emphasising the importance of expectations for macroeconomic outcomes, notes that while expectations that the authorities can and will intervene effectively to achieve stability will in themselves be stabilising, fears of a progressively worsening situation will operate to make things even worse.

Keynes stressed the central role of long-term expectations. He had in mind in particular expectations of real variables – effective demands and real returns on investments. They might be either stabilizing or destabilizing. If business managers believe that recessions will quickly be reversed, their actions will help bring about recoveries. If they expect business activity to continue to be subnormal or to fall further, their pessimism may turn recession into depression. That is why policies and policy expectations are very important. After World War II, widespread perception that government fiscal and monetary policies would keep recessions short and shallow helped to keep them short and shallow.

By contrast, extrapolative expectations are destabilizing. Policies – policy rules if you like – that create and sustain regressive expectations of output and price departures from equilibrium are destabilizing. These facts are wholly consistent with the contentions of Fisher and Keynes . . . that *in the absence of activist 'feedback' policies, monetary and fiscal, flexibility may well be destabilizing,*

¹⁷ Patinkin (1959, pp.582-587) was sceptical of the possibility of deflation providing a way out of recession: 'The automatic adjustment process of the market is too unreliable to serve as the practical basis of a full-employment policy. In other words, though the real balance effect must be taken account of in our theoretical analysis, it is too weak – and, in some cases (due to adverse expectations) too perverse – to fulfil a significant role in our policy considerations'.

both to prices and to real macro variables. Governments and central banks should not expect disinflation or deflation alone to maintain or restore full employment. [Emphasis added]

The dangers of deflation are again, both in the light of recent Japanese experience, and with the outbreak of the present financial and economic crisis, emerging as a source of concern.

An informed observer of the Japanese scene (Makin, 2006) writes:

Deflation is dangerous. The nightmare of a deflationary spiral arises from the fact that as deflation intensifies and prices fall more rapidly, the real cost of borrowing rises. With a zero interest rate and 1 per cent deflation, the real cost of borrowing is 1 per cent. If deflation intensifies to 2 per cent, while the demand to hold cash strengthens because the rise in deflation represents a rising, risk-free, tax-free return on cash: more cash will be demanded. The move into cash further depresses spending and thereby further intensifies deflation. The real cost of borrowing keeps rising, imparting an accelerating drag on the economy. . . . As noted, a deflationary spiral produces a sharp increase in the demand for liquidity that, if not satisfied by the central bank, will be satisfied by households and businesses selling goods and services, thereby intensifying the deflationary spiral.

Deflation is thus seen as something to be avoided if at all possible. We are a long way from the facile New Keynesian or New Classical position that, in depression conditions, downward stickiness of prices inhibits adjustment and that a property of an ideal economic system – in order to ensure instantaneous attainment both of the equilibrium set of relative values and the proper level of prices – would be perfect flexibility of prices

Conclusion

We suggest that the (widely-held) view to the effect that greater flexibility of wages and prices than exhibited by the typical modern economy would ensure a correspondingly greater degree of macro economic stability, is untenable. While we are happy to allow that, in the micro context of balancing of supply and demand in the individual markets of the economy,

flexible prices may be advantageous, we make the point that in the macro context the situation is very different. We noted several instances of theorists attributing macroeconomic problems to inappropriate values, but concluded that - in failing to recognise that the recommended price adjustments cannot be expected to achieve what is required - these diagnoses miss the point. We have emphasised too that the recommendation of general price deflation as a cure for unemployment is not only unrealistic, but dangerous.

As we understand the situation, the fundamental reason why macroeconomic disequilibria cannot be attributed to wage and price inflexibility is that there is no basis for the belief that, whenever the macroeconomy is out of equilibrium, a potential market clearing solution (a set of equilibrium prices and quantities across all markets) actually exists, and might therefore be found through the free operation of the price mechanism. Why should such a solution *not* be available? The answer is that as the real world economy operates within historical time, the future cannot be known with certainty and, in consequence, the economy cannot realistically be conceived of as a 'closed' system in the sense that, in the aggregate, demand is reliably tied to supply. Only if that were so would New Classical and New Keynesian faith in the necessary existence of a potential solution be justified. Unless, however, Say's Law holds good, or that the economy possesses a complete set of markets such that insurance can be taken out against all contingencies, or indeed, that agents trading within the economy - consuming and producing, saving and investing - are fully omniscient (all of which conditions come to the same thing) the optimistic faith of mainstream macro economists in price adjustment to secure, under all circumstances, equilibrium at full employment, is misplaced.

What are the practical implications? As the system is over-determined – more conditions of equilibrium to be met than unknowns (prices and quantities) to be discovered – *it is no use relying on market forces to generate a state of full employment*. But all is not lost: attention (of policy-makers) should be focused on the parameters of the system, to achieve, if possible, appropriate parametric change which might permit the emergence within the economy of more consistent conditions of demand and supply.

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