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"THE WICKSELL-KEYNES CONNECTION: DYNAMIC ANALYSIS, LOANABLE FUNDS, AND WAGE FLEXIBILITY"

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Summary:

This paper examines loanable funds models with a stabilized rate of interest, in which the banking system fills in the gap between the flows of demand and supply of funds. A typical Wicksellian model is developed to highlight the importance of credit and inflation (or deflation) in closing the gap between saving and investment. Replacing the nominal rate of interest by the real rate - an appropriate modification in a model in which inflation is important - and using a Robertsonian definition of income we find that depending on the response of 'lacking' and investment to inflation, the possibility of an unstable system may arise. Introducing unemployment into the system we find that if investment is more responsive to inflation than is lacking, the greater the degree of wage flexibility, the greater will be the level of equilibrium unemployment in face of a demand shock, and the greater the chances of macroeconomic instability. Finally, we show if we replace the Robertsonian definition of income by a Keynesian one, investment is more responsive to inflation, so that wage rigidity is necessarily a good thing.

Resumo:

Este trabalho examina os modelos de fundos emprestáveis com uma taxa de juros estabilizada, na qual o sistema bancário preenche o hiato entre o fluxo de demanda e a provisão de fundos. Um típico modelo Wickseliano é desenvolvido para ressaltar a importância do crédito e inflação (deflação) em fechar o intervalo entre poupança e investimento. Substituindo a taxa nominal de juros pela real - uma modificação apropriada num modelo cuja inflação é relevante - e usando a definição de renda Robertsoniana, percebemos que, dependendo da reação da 'carência' (lacking) e investimento à inflação, existe a possibilidade do sistema se tornar instável. Introduzindo desemprego no sistema, percebemos que o investimento é mais sensível do que a carência à inflação, quanto maior o grau de flexibilidade salarial, maior será o nível de equilíbrio de desemprego, em face do choque de demanda, e maiores as chances de instabilidade macroeconômica. Finalmente demonstramos que se substituirmos a definição de renda Robertsoniana pela Keynesiana, o investimento se torna mais sensível à inflação, tornando a rigidez salarial, necessariamente, um bom negócio.

1. Introduction

Several interpreters of Keynes have recently stressed the relation between the macroeconomics of Wicksell and Keynes. Leijohnhufvud (1981) has argued that Keynes's Treatise on Money is part of the 'Wicksell connection' for it adopts a stock-flow approach to the determination of the rate of interest whereby the market rate of interest tracks the natural rate. In the General Theory, Keynes gives up the stock-flow approach, and introduces a purely stock equilibrium version of the liquidity preference theory. Leijohnfvud sees Keynes's movement as retrogressive because it neglets the important role of flow adjustment present in the loanable funds mechanism. Kohn (1981) develops Leijohnfvud's argument, and shows that in a dynamic loanable funds model, if the rate of interest is somehow stabilized, an "unemployment equilibrium [exists] if and only if the money wage is completely rigid." (p. 861).[1] Kohn (1986) reinforces this point by noting that "whether Keynes liked or not, his equilibrium analysis did depend on a fixed money wage." (p. 1216) Kohn thus questions Keynes's claim that his theory of unemployment does not depend on wage rigidity.[2] He also criticizes Keynes for using a static equilibrium method, and supports a dynamic sequence method for analyzing the problem of unemployment.

Three important issues have thus been raised in these discussions. First, there is the issue of the Wicksellian loanble funds approach versus the Keynesian liquidity preference approach. Second, there is the issue of a static versus a dynamic method. Third, there is the issue of the role of wage rigidity in Keynes's economics, and the effects of greater money wage flexibility.

The purpose of this paper is to examine these issues related to these discussions on the Wicksell-Keynes connection. We start in section 2 with the neoclassical natural rate model, and in section 3 turn to the Wicksellian model. We then discuss Kohn's contribution to the Wicksellian approach and examine the possibility of instability in section 4. In section 5, we

introduce the possibility of departures from full employment, and examine the role of wage rigidity in explaining unemployment equilibrium. Section 6 concludes.

It should be stated at the outset that the models that we present here are not claimed to be definitive models representing Wicksellian or Keynesian analysis. They simply reflect our explorations along a path of models which emphasize the Wicksell-Keynes connection, and from which some conclusions on the controversies mentioned above can be drawn.

2. A Neoclassical Framework and Model

In this section we describe a neoclassical framework which will form the basis of the analysis in the rest of the paper, and discuss a neoclassical model of full employment and the natural rate of interest. We adopt the neoclassical framework so that the theoretical departures from it made in the subsequent models become readily apparent. The framework is borrowed, with some modifications, from Kohn (1981).

To describe the framework we consider in turn the labor, goods, and asset markets. Time is treated in discrete intervals to take into account the time-sequence of decisions and actions.

In the labor market purely competitive firms hire labor to produce output with a neoclassical production function

$$Y_t = F(N_t) \tag{1}$$

with $F' > 0$ and $F'' < 0$, where Y_t is real output, and N_t is the level of employment of labor (all at time t), and where capital goods and technology are assumed to be given in the short period. Firm maximize profits given wages and price expectations, so that

$$F'(N_t) = W_t/P_{t+1}^e \tag{2}$$

where W_t is the money wage and P_{t+1}^e the expectation of the price in period t+1 formed in

period t (the production and employment decision and activity occurring this period, and the output being sold in the next period). The supply of labor is inelastically given at the level N_f.[3] Given the expected price, if the money wage is perfectly flexible to clear the market, full employment will always be achieved, and the market-clearing real (expected) wage will be given by

$$V^* = F'(N_f). \tag{3}$$

In the goods market output produced in the previous period, Y_{t-1}, is sold in this period in a purely competitive market. Demand for goods comes from two sources: consumption demand from households, and investment demand from firms. Households earn money income from income generated in the previous period, Z_{t-1}, and spend a fraction c of it, so that

$$P_tC_t = c_tZ_{t-1} \tag{4}$$

where C_t is real consumption, and P_t the current price. This introduction of lags produces a Robertsonian treatment of income, which we will later contrast with Keynes's treatment. We assume that c depends inversely on the nominal interest rate in the present period, i_t (ignoring expectational issues), so that

$$c_t = c(i_t) \tag{5}$$

where $c_i < 0$: a higher return to abstinence from consumption implies lower consumption. Firms make investment plans based on the costs of, and returns to, investment. Costs are interest costs, and returns are prospective yields, which are summarized by the symbols θ, so that

$$I_t = I(i_t, \theta) \tag{6}$$

where $I_i < 0$ and $I_\theta > 0$, and where I_t is real investment. Finally, market clearing in the goods market is achieved, in any period, by variations in price. The goods market equilibrium condition, given perfect price flexibility, is

$$Y_{t-1} = C_t + I_t. \tag{7}$$

Finally, for the assets markets, we assume there are two assets, money and bonds. Households have money held over now from the last period, H_{t-1}, to which they add their money income from the proceeds of the last period, and use this to consume, buy bonds, and hold money. The households' budget constraint is thus

$$M_t = H_{t-1} + Z_{t-1} \equiv P_tC_t + B_t^H + H_t \tag{8}$$

where B_t^H is flow the demand for bonds by households, and H_t the flow demand for money (assuming that firms do not demand any money), and M_t the total flow of money available to households. The demand for money is assumed to depend on household money expenditures (on consumption) and the interest rate (measuring the opportunity cost of holding money), so that

$$H_t = H(P_tC_t, i_t) \tag{9}$$

where $H_1 > 0$ and $H_2 < 0$ and where the function H is assumed to be homogeneous with respect to P_t (assuming away money illusion). Given the pre-deterimined amount of money resources available to households, and their consumption plans described in equations (4) and (5), the demand for money implies a demand for bonds (or net supply of loanable funds by households) given by

$$B_t^H = M_t - cZ_{t-1} - H(cZ_{t-1}, i_t). \tag{10}$$

The supply of bonds (or demand for loanable funds) is given by

$$B_t^F = P_tI_t. \tag{11}$$

We now use this simple framework to examine a neoclassical model with full employment and the natural rate of interest, which assumes that the money wage, the price level, and the rate of interest are perfectly flexible, and that banks, if they exist, only intermediate between borrowers and lenders and lend at cost, and do not make any net loans.

For this model, perfect wage flexibility implies a real wage V^*, which ensures that full employment prevails, so that output in all periods is given by

$$Y_f = F(N_f). \tag{12}$$

Perfect price flexibility implies that the goods market clears at the full employment level of output in all periods, so that, from equations (4) through (7), we get

$$Y_f = c(i_t)[Y_f/(1+\pi_t)] + I(i_t,\Theta) \tag{13}$$

where $\pi_t = (P_t/P_{t-1})-1$ is the rate of inflation in period t. Finally, perfect interest rate flexibility, and the equilibrium condition

$$B_t^H = B_t^F \tag{14}$$

implies (from equations (10) and (11)),

$$(M_t/P_t) - c(i)[Y_f/(1+\pi_t)] - H(c(i)[Y_f/(1+\pi_t)],i) = I(i_t,\Theta) \tag{15}$$

Equations (13) and (15) together imply

$$M_t/P_t = Y_f + H(c(i)[Y_f/(1+\pi_t)],i_t) \tag{16}$$

With equilibrium (or market clearing) in the labor market already achieved, equations (13) and (16) jointly yield equilibrium in the goods and assets markets. With banks not making any net loans, and therefore holding money supply at M, these two equations have three variables: i_t, P_t and π_t. But if P_t is determined in equilibrium, π_t, in equilibrium, must be zero. Setting $\pi_t = 0$ in (13) and (16) we can solve for the equilibrium value of i_t from equation (13) and the equilibrium value of P_t from (16). The determination of these equilibrium values is shown in Figure 1. In the left-hand side we have the saving curve representing

$$S_t(Y_f) = [1-c(i_t)]Y_f \tag{17}$$

showing real saving at full employment, and the investment curve showing equation (8) for a given Θ. This rate of interest, which equates savings and investment at full employment, given

θ, is called the natural rate of interest, which we will denote by i_n. The intersection of these two curves determines i_t in equilibrium, and in the right-hand side the curve showing

$$M/P_t = Y_f + H(c(c(i_t)Y_f,i_t)$$

determines M/P_t, and hence P_t.

Two implications of this neoclassical model should be noted. First, if there is a downward shift in prospective yields, so that the I function shifts to the left to the dotted line shown in the figure, the equilibrium level of i will fall, and so will the price level. Thus a decline in θ, which in the neoclassical interpretation depends on future productivity, causes a fall in the natural rate of interest, as well as a fall in the price level. Second, if the money supply, M, is increased, there is no change in the natural rate: only the price level increases equiproportionately. Thus the quantity theory of money holds, although the mechanism by which the increase in money occurs, and how it affects the price level, is not made clear in this model.

3. A Wicksellian Model

Wicksell's development of this neoclassical model - although his ideas were anticipated to a large extent by Thornton and Joplin[4] - lay primarily in introducing the role of banks as active creators of credit money.

This development can be incorporated into the framework of the previous section by assuming that banks fix the market rate of interest at i_m, and make up the difference between the demand and supply of loanable funds by creating (or destroying) credit money. Thus,

$$DM_t = B_t^F - B_t^H \qquad (18)$$

where D refers to the change in the variable immediately following it. We continue assuming that banks have no costs and no profits. In contrast to the neoclassical natural rate model where

money supply is exogenously given and the interest rate is variable, in this Wicksellian model the interest rate is given at i_m and money supply is endogenously determined.

The labor market functions as before, with perfect money wage flexibility assuring full employment.

In the goods market we continue assuming that the price level is perfectly flexible, so that the goods market again clears as shown by equation (13).

Finally, turning to the assets market, equation (18) implies that equation (16) must be replaced by

$$(M_t/P_t)(1+m_t) = Y_f + H(c(i_t)[Y_f/(1+\pi_t)],i_t). \tag{19}$$

where $m_t = DM_t/M_t$.

Equation (13) now solves for the equilibrium value of π_t with $i_t = i_m$, given by

$$\pi = \{I(i_m,\Theta)-[1-c(i_m)]Y_f\}/[Y_f-I(i_m,\Theta)] \tag{20}$$

Substituting for $i_t = i_m$ and the equilibrium value of π in the right-hand side of (19) implies that that side, and hence, the left hand side, is constant in equilibrium. With m_t constant in equilibrium, M_t/P_t must also be constant, so that $m_t = \pi_t$.

To compare this model with natural rate model of the previous section, we reproduce the S and I curves of Figure 1 in Figure 2. Assume, initially, that the market rate is set by banks equal to the natural rate, so that, as in the previous model, $\pi=0$. Now assume that Θ falls, so that the investment curve shifts to the left as shown by the dotted line, but that the banks keep the market rate unchanged. There now emerges a gap between the S and I curves in the figure, so that by (20) the equilibrium $\pi<0$. With the equilibrium deflation rate determined, the rate of fall in money supply is determined to be equal to it.

Three comments on this Wicksellian model are in order. First, in this model banks, and

not the impersonal forces of the supply and demand for credit (which depend on conditions of productivity and thrift) determine the actual interest rate. This allows banks to play an active role in credit markets, rather than be a passive intermediary. Second, in this model, as in the previous one, we have $m = \pi$ at equilibrium, so that the quantity equation still holds. However, what is new in this model, is that we have a story of why the money supply changes and of why money supply growth results in inflation.[5] Money supply changes because banks actively create and destroy loans in response to credit market conditions. Changes in credit money by banks allow investment to differ from, at constant prices, saving (if i_m is different from i_n), thereby creating an excess supply or demand in the goods market, which causes deflation or inflation. Third, inflation and deflation can continue indefinitely as long as banks do not change the rate of interest rate i_m; this model has thus been dubbed a model of a cumulative process. Banks may change the rate, however, if they acquire an excessive amount of reserves (or lose an excessive amount), in which case there will be a tendency of the market rate to return to the natural rate.

4. A Modified Wicksellian Model

The Wicksellian model of the previous section, which is essentially the model described by Wicksell and formalized in several recent presentations (Laidler, 1975, Eagly, 1974, Humphrey, 1990) marks an advance over the earlier neoclassical natural rate model, but is deficient in ignoring inflationary expectations as a determinant of saving and investment. The problem is that while the model assume that the propensity to consume and the level of investment depends on the nominal interest rate, it is more appropriate, in an environment in which inflation or deflation occurs, to make them depend on the real interest rate. This section follows Kohn (1981) in modifying the model of the previous section along these lines, and showing that in that case there

may not be a stable adjustment to equilibrium after a reduction in θ.

We modify our analysis by now replacing i_t in equations (5) and (6) by the real rate r_t, given by

$$r_t = (1+i_t)/(i+\pi_t^e) - 1 \tag{21}$$

and rewriting these equations in the form

$$c_t = c(i_t, \pi_t^e) \tag{5'}$$

with $c_i<0$ $c_\pi>0$, and

$$I_t = I(i_t, \pi_t^e, \theta) \tag{6'}$$

with $I_i<0$, $I_\pi>0$, and $I_\theta>0$.

The labor market behaves as before, with output determined at full employment by perfect wage flexibility.

For the goods market, using equations (5') and (6') we replace equation (13) by

$$Y_f = c(i_t,\pi_t^e)[Y_f/(1+\pi_t)] + I(i_t,\pi_t^e,\theta) \tag{13'}$$

and for the assets markets a similar modification can be made in equation (19).

Confining attention to the goods market, where the source of instability lies, assume that starting from an initial situation at which i_m is equal to i_n at which $\pi_t=0$ and $\pi_t^e=0$, there is a fall in θ and banks do not adjust their lending rate. Assuming no change in π^{te}, there will be an excess supply of goods which will case the price level, P_t, will drop, implying a fall in π_t, clearing equation (13') given $i_t=i_m$. This fall in π_t, however, will lead to a downward revision in π_{t+1}^e which causes c and I to fall, other things constant. There will thus again be an excess supply in the goods market, causing further reductions in π and π^e. Whether this adjustment process will be stable depends on whether the expectations adjustment mechanism is stable, which we assume, and on the responsiveness of aggregate demand to changes in π. If the

adjustment is stable, the economy will arrive at a new short-period equilibrium at which $\pi = \pi^e$. At this equilibrium m = π which can be shown using an argument analogous to the one in the previous section.

To examine the second issue, we set $i_t = i_m$ and $\pi = \pi^e$ (so that short-period equilibrium prevails) and rewrite equation (13') as

$$Y_f - c(i_m, \pi_t)[Y_f/(1+\pi_t)] = I(i_m, \pi_t, \Theta) \qquad (22)$$

The two sides of this equation are shown in Figure 3 as the $L(\pi)$ and $I(\pi)$ curves, respectively. The left-hand side measures what Robertson called 'lacking' (see Kohn, 1981, p. 870), and its responsivness with respect to changes in π is given by

$$L_\pi = - c_\pi[Y_f/(1+\pi)] + cY_f/(1+\pi)^2$$

which has an ambiguous sign, since $c_\pi > 0$ (assuming $\pi > -1$, that is, bounding the deflation rate to be above 100 per cent). The first term shows that lacking falls with inflation as households desire to consume more because, given nominal interest rates, higher inflation reduces the real return on saving. The second term shows that higher inflation reduces the buying power of money income from last year, and therefore causes greater forced lacking, what we will called the forced saving effect. The right-hand side, which simply measures real investment, has a derivative of I_π, which is necessarily positive. Two cases are shown in Figure 3. In (a) the L curve slopes up more than the I curve, while in (b) the opposite is true. The case in which the L curve slopes down is similar to case (b), and need not be separately analyzed.

As before, assume an initial situation in which banks set i_m equal to the natural rate, so that the lacking and investment schedules in Figure 3 intersect at $\pi = 0$. A reduction in Θ, without banks keeping i_m unchaged, causes the I curve to shift down. The new short-period equilibrium is established at E_2. However, with an adjustment story like that told above, the economy will

experience reductions in π. Thus, in Figure 3(a), it will tend to move towards the short-period equilibrium - and assuming that the expectations process is stable, the economy will move to this new stable equilibrium. But in Figure 3(b), it will tend to move away from the equilibrium, with ever decreasing rates of deflation.

To prepare the ground for the analysis of the next section, this unstable case can be portrayed using a somewhat different diagram, as in Figure 4. Using equation (22), but removing the restriction $Y_t = Y_f$, we can find a relation between π and Y, given by

$$Y_t - c(i_t,\pi_t)[Y_t/(1+\pi_t)] = I(i_t,\pi_t,\Theta) \qquad (22')$$

and draw it as the DD line. The slope of this line is given by

$$dY/d\pi = \{I_\pi+c_\pi[Y/(1+\pi)]-c_Y/(1+\pi)^2\}/[1-c/(1+\pi)] \qquad (23)$$

Assuming that $Y=Y_f$ at $\pi=0$, and $\pi>-(1-c(i,0))$ the slope of this line at $\pi=0$ has the same sign as $I_\pi-L_\pi$. In the unstable case, therefore, the DD line is upward rising, as shown in the figure. Since the economy is always at full employment, so that $Y = Y_f$, we can draw a horizontal supply curve SS. If we start from an initial position at which $i_m = i_n$, so that $\pi=0$, we are at a short-period equilibrium at E_1. If Θ falls, given that $\pi>-(1-c(i,\pi))$, the DD curve will shift downwards, implying a new short-period equilibrium at E_2. The economy, however, will move to the left along SS as shown by the arrows.

5. Unemployment and Keynes

It is well known that Keynes departed from Wicksellian analysis in two main ways. First, he introduced unemployment into the analysis and thus gave a role to the output and employment multiplier. Second, he shifted from a period model to what has been called a static equilibrium model, one important feature of which is the shift from the loanable funds approach to the

liquidity preference approach to assets markets.[6] In this section we first dispense with the assumption of full employment due to perfect wage flexbility, and then consider the implications of the so-called shift from period analysis to static analysis.

We introduce unemployment into our analysis by departing from the assumption of perfect money wage flexibility which ensures full employment all the time.[7] Again following Kohn (1981), we introduce wage rigidity by assuming

$$W_t - W_{t-1} = \alpha(W^* - W_{t-1}) \tag{24}$$

which states that if the money wage is above (below) the market- clearing wage it will fall (rise) over time at a speed determined by the speed of adjustment constant α. If $\alpha=1$ then the money wage is perfectly flexible, and we are back in the case discussed so far, which if $\alpha=0$ the money wage is fixed.

In short-period equilibrium the level of output must be constant, and therefore, given profit-maximization by firms, so must the real wage, V. This implies that in short-period equilibrium the money wage must change at the rate of inflation, implying

$$W_t = (1+\pi)W_{t-1} \tag{25}$$

where π is the short-period constant level of the rate of inflation.

We next use these equations to derive the supply curve for the economy, showing levels of output that profit-maximizing firms we will produce at each rate of inflation. Substituting equation (25) into (24) we get

$$V = \alpha V^*(1+\pi)/(\alpha+\pi) \tag{26}$$

where V^* is the real wage at full employment. Substituting (26) into the marginal productivity condition, and solving for the profit-maximizing level of output we get

$$Y = F(F'^{-1}(\alpha V^*(1+\pi)/(\alpha+\pi))) \tag{27}$$

which is the equation for the supply curve SS in Figure 5.

This curve has the following properties.[8] First, it is upward-rising in its economically relevant range. Differentiating Y with respect to π we get

$$dY/d\pi = -\alpha(1-\alpha)V^*F'/F''(\alpha+\pi)^2. \tag{28}$$

Since $F'>0$ and $F''<0$, it follows that $dY/d\pi>0$. A higher rate of inflation, given the degree of wage flexibility, implies a lower real wage, and hence a higher level of output. Second, at $\pi=0$, $Y = Y_f$, as can be seen by substituting $\pi=0$ in (27). Third, in the neighborhood of $\pi=0$ the slope of the curve falls as α rises. This is seen by noting that $F'=V$, and substituting from (26) into (27) and evaluating at $\pi=0$ to get

$$dY/d\pi\,|_{\pi=0} = -[(1-\alpha)/\alpha]V^{*2}/F''$$

which is positive and clearly falls with α.

To examine the behavior of the economy we bring this supply curve together with the demand curve discussed at the end of the previous section. Three cases are shown in Figure 6. In each of the diagrams SS is the supply curve, drawn for α between 0 and 1, DD is the demand curve the economy starts off with, and that the economy is initially at a short-period equilibrium with $Y=Y_f$ and $\pi=0$, at E_1, with $i_t = i_n$. There is then an exogenous decline in θ, which, assuming the condition stated in the previous section, shifts the demand curve down to D'D'. In each case the new short-period equilibrium is at E_2.

In each case the reduction in demand due to the fall in investment causes P_t to fall, which, given a degree of money wage rigidity causes the real wage to rise, implying a fall in output, and a fall in the rate of inflation. The economy thus adjusts with unemployment and deflation. Assuming a stable expectations process, in Figures 6(a) and (b), the economy will converge to the short-run equilibrium level at E_2. But in Figure 6(c) the economy experences

diminishing levels of Y and π, moving further and further away from full employment.

This analysis leads to two important conclusions.

First, the stability of the adjustment process depends on the slope of the demand curve. If it is downward sloping, then given the upward-rising supply curve adjustment is stable, as in case (a). If it is upward sloping, that is, if investment is more responsive to changes in the inflation rate than is lacking, stability depends on whether it is steeper or flatter than the supply curve. Second, and most importantly for our purposes, the nature of adjustment depends on the degree of wage rigidity in the economy. In the case of the downward-sloping demand curve, that is, case (a), greater wage rigidity, by causing the SS curve to be steeper (as shown by the curve S'S') implies a short-period equilibrium level of output which is lower than E_2, at E_3. Thus greater wage rigidity in this implies that the economy experiences a greater loss in employment and output for a given demand shock. If the demand curve is upward-rising, however, but the adjustment is stable, as in case (b), the demand shock will imply a lower reduction in output (at E_3, for instance) with greater wage rigidity. In this sense, greater wage rigidity may be a blessing for the economy. Moreover, if the degree of wage flexibility is very high (so that we come to case (c)), the economy will be destabilized, and given a demand shock it will experience continuously declining employment and output.[9] If the demand curve is upward-rising, the greater the degree of wage flexibility, the greater the chances for instability. Perfect wage flexibility will imply a horizontal supply curve, as discussed in previous sections, and there will never be a deviation from full employment. But surely perfect flexibility is an ideal which cannot be satisfied in any economy where the wage adjusts when unemployment appears. For such economies, if the demand curve is upward rising, more harm can be done by increasing the degree of wage flexibility.

This is entirely consistent with the views of Keynes, who argued in chapter 19 of the General Theory, that greater wage flexibility is not good for the economy. Keynes provided several reasons to support this claim, and Post Keynesians have added other reasons.[10] But in the model discussed in this paper, this happens when the demand curve is upward rising, that is, when greater deflation, by reducing consumption and investment demand through the real interest effect more than it increases consumption by reducing the level of forced saving due to inflation, reduces the level of aggregate demand. It is interesting to note that the real interest rate effects, in fact, were ignored in the original Wicksellian model of section 3, and this implies that for that model the demand curve is necessarily downward sloping, and economy was a stable one, and further, that wage flexibility was a good thing (if unemployment is introduced in it as in this section).

Keynes, in his analysis, in fact ignored the forced saving effect by assuming that current consumption depends on current income generated from current production, rather than from money income earned in the previous period. Keynes can be taken here to imply that lags in consumption are short (lags between production and income, as well as income and consumption) or that consumers base their consumption plans on expected income during that period, so that in an equilibrium situation, with expected income equal to actual income, consumption would depend on current realised income. The result of this modification is that the goods market equation (22') becomes

$$Y_t - c(i_t,\pi_t)Y_t = I(i_t,\pi_t,\theta) \tag{29}$$

The effect of inflation on the market clearing level output is now

$$dY_t/d\pi_t = (i_\pi + c_\pi Y_t)/[1-c(i_t,\pi_t)]$$

which is necessarily positive, so that the demand curve is necessarily upward rising. Thus a

Keynesian version of the model of this paper implies unambiguously that greater wage flexibility is a bad thing (in the sense described above).[11]

We end this section with a comment on the asset markets. Notice that we have not mentioned the asset market in this section, and this is because it is not important for any of the points raised here. All we have assumed is, a la Wicksell, that the interest rate is fixed at i_m, and that money supply is endogenous.[12] It does not matter what precise theory of asset market equilibrium we adopt: the loanable funds approach as discussed earlier in the paper, or Keynes's liquidity preference approach focusing on the stock supply and demand for money. Thus, if the models considered in this section are valid interpretations of Keynesian analysis, it seems unimportant to argue about the relative advantages and disadvantages of the two theories.

6. Conclusion

In this paper we have examined loanable funds models with a stabilized rate of interest in which the banking system plays an important role in filling in the gap between the flows of demand and supply of funds. We examined the typical Wicksellian model to highlight the importance of credit and inflation (or deflation) in closing the gap between saving and investment. We then replaced the nominal rate of interest by the real rate - an appropriate modification in a model in which inflation is important - and using the Robertsonian definition of income concluded that depending on the response of 'lacking' and investment to inflation, the possibility of an unstable system arises. In simple terms, what this exercise shows is that, contrary to what the typical Wicksellian model and the modified model of Kohn (1981) say, deflation may not be able to restore equilibrium in the goods market. We finally introduced Keynes's definition of income and came to the conclusion that the greater the degree of wage flexibility, the greater will be the level of equilibrium unemployment in face of a demand shock.

We draw three important conclusions from the foregoing analysis. The first is that liquidity preference does not play an important role in Keynes's analysis of the determinants of employment. Interest rate rigidity does make a difference but one could think of other 'theories' to explain the stabilization of the rate of interest: either the Wicksellian approach based on the lending policies of banks, or the notion that the Central Bank could simply peg the rate of interest. In this respect therefore, we come to the conclusion that the liquidity preference versus loanable funds controversy is rather unimportant, provided we accept the constant interest rate model.

Second, we conclude that the relevant issue in discussing the relation between wage flexibility and unemployment, and the stability of the adjustment process, should not be the method of analysis - static or dynamic as suggested in Kohn (1986) - but rather the notion of income employed. Just as in Kohn (1981) our model results from a dynamic or sequence analysis approach but the outcomes are quite different. In dynamic analysis adjustment processes are looked at carefully and expectations play an important role in determining agents' decisions. However, Kohn also associates dynamics with the Robertsonian notion of income based on lagged output and prices without any good reason for doing so. Lags may not be very important, or consumers may plan their consumption expenditures based on expected income just as as Keynes's analysis seems to suggest.

Finally, it should be stressed that wage flexibility may be destabilizing. This is not the case in the standard Wicksellian model which focuses only on the forced-saving effects of inflation, but emerges as a possibility in the Wicksellian model if real interest effects are taken into account. In the Keynesian model, where forced-saving effects are ignored, the deleterious effects of money wage flexibility become a central issue.

FOOTNOTES

1. The quotation seems to contradict Kohn's own results for he shows that a situation of unemployment equilibrium could arise if wages were slow to adjust to unemployment. The contradiction vanishes if he implicitly meant unemployment equilibrium cum stable prices.

2. See Dutt and Amadeo (1990a).

3. Nothing of substance changes if labor supply responds to the real wage, or the expected real wage.

4. See Humphrey (1990)

5. A story of how additional money leads to inflation could be told in the previous model by introducing a real balance effect, for instance by assuming that $P_tC_t = cM_t$, where M_t can be added on to by 'helicopter' changes. There would still be no proper story of how money supply changes.

6. See Kohn (1986) for an extended discussion of this point of view.

7. This is not the same as assuming that the wage is rigid, or to endorse the neoclassical Keynesian view that unemployment is due to a rigid wage. Keynes's own method was to first fix the money wage and determine the level of employment, and then discuss the consequences of changing the money wage. We will follow an analogous procedure here.

8. The discussion follows Kohn (1981), with one minor difference regarding the first property.

9. We have only analyzed local stability properties, but local departures from full employment are the only ones that may be politically feasible in advanced capitalist economies.

10. See Dutt (1986-7), Dutt and Amadeo (1990) for a discussion of these reasons.

11. Keynes was actually not so unambiguous about this. We get this unambiguous result in this model because it removes the stabilizing features of wage reductions - such as the so-called Keynes effect.

12. Wicksell, as noted above, relied on the role of banks. Kohn stresses the role of speculators in Keynes's analysis. Post Keynesians such as Moore (1988) seem to return to the Wicksellian story.

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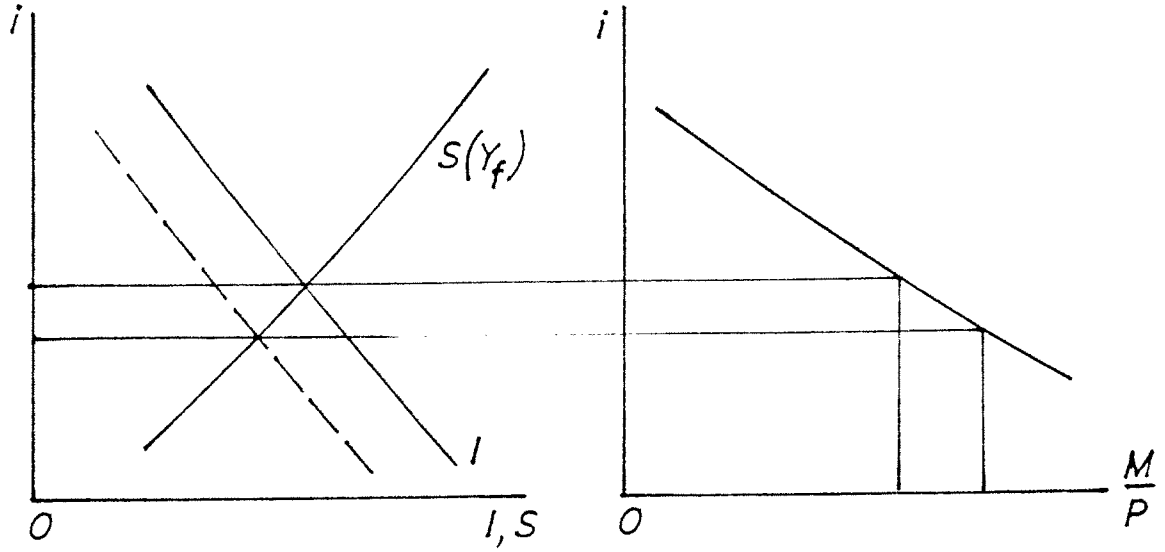


Figure 1

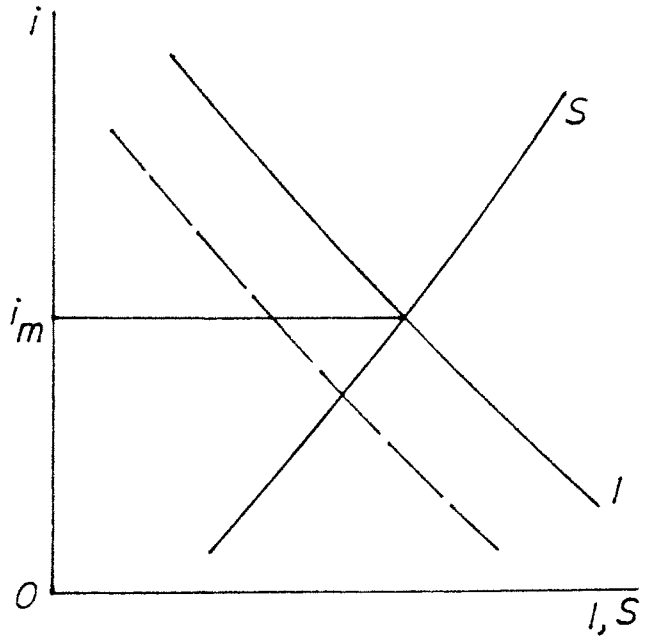
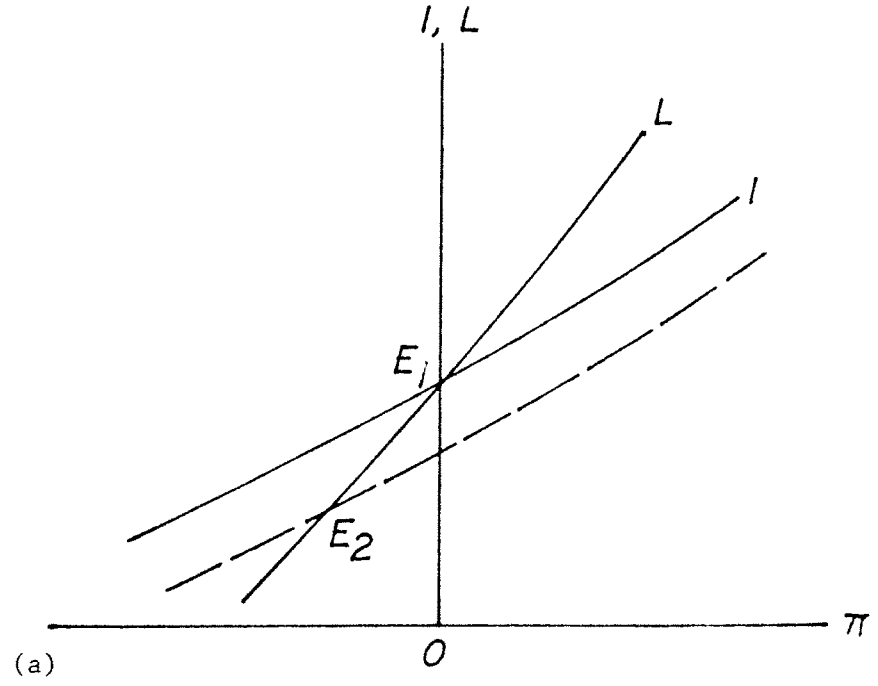


Figure 2



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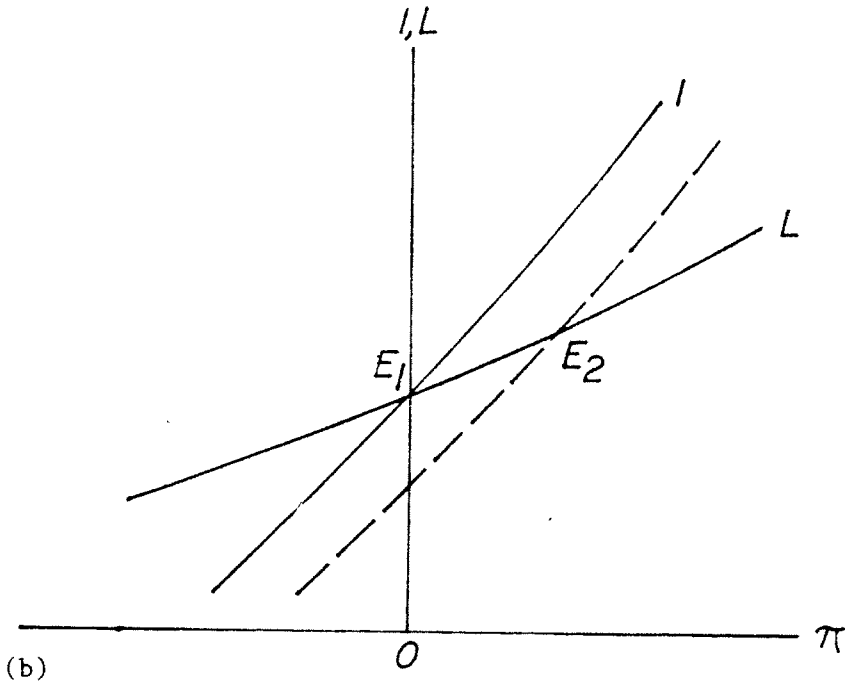

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Figure 3

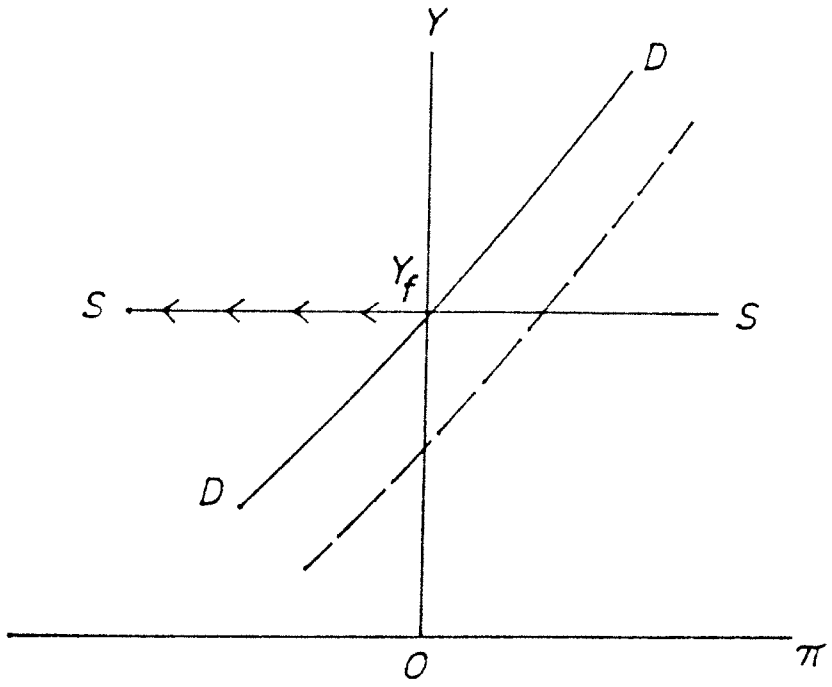

Figure 4

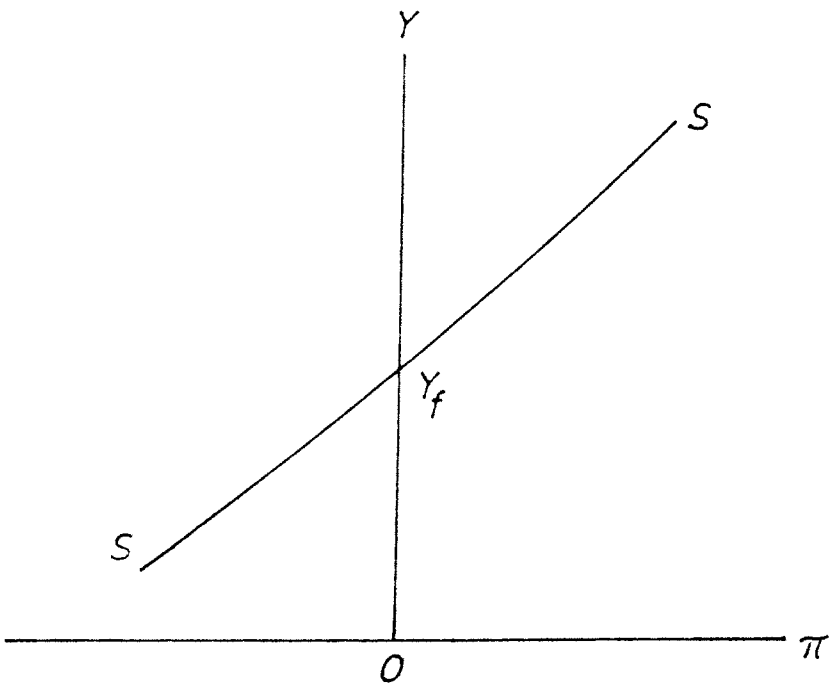

Figure 5

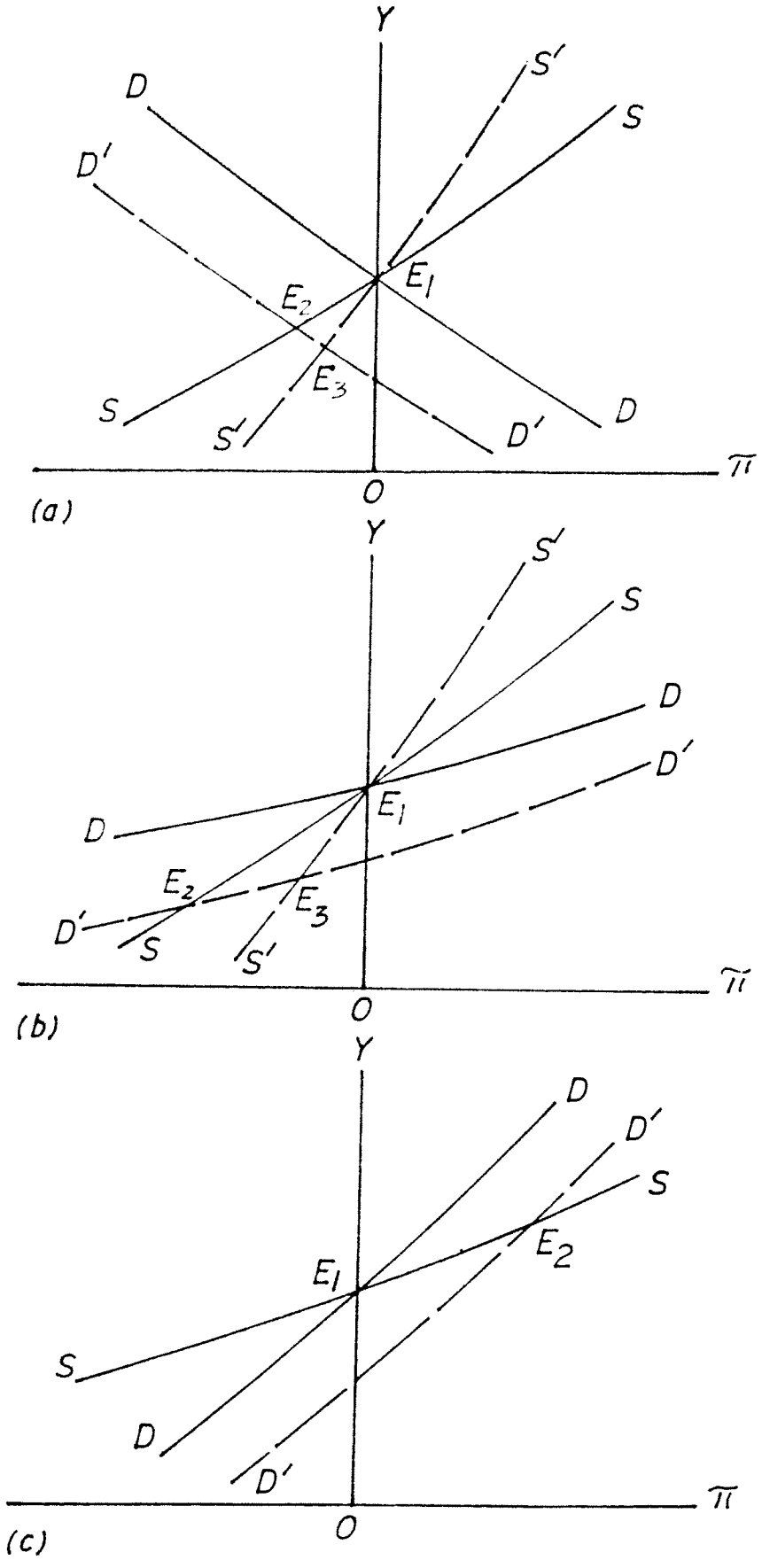
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Figure 6

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