



The University of Adelaide  
School of Economics

Research Paper No. 2008-04

# **The Principle of Effective Demand and the State of Post Keynesian Monetary Economics**

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*(Revised 20/08/08)*

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**Introduction**

Keynesians of all shades have generally misunderstood the theoretical structure of the *General Theory*. What is missing is an appreciation of the principle of effective demand.

As Laidler (1999) has documented, Old Keynesians largely fabricated the *theoretical* basis of the Keynesian Revolution and retained the ‘classical’ analysis of long-period equilibrium. Old Keynesians generally took Frank Knight’s (1937) advice to ignore the claim to revolution in economic theory and interpreted the *General Theory* as another contribution to the theory of business cycles. This is most obvious from the Old Keynesian reliance on wage rigidity to generate involuntary unemployment. But for Keynes (1936, chapter 19), wage and price stickiness is the ‘classical’ explanation for unemployment to be contrasted with his explanation, in terms of the principle of effective demand, where the flexibility of wages and prices cannot automatically shift long-period equilibrium to full employment. New Keynesians have continued the ‘classical’ vision by providing the microeconomic foundations for the ‘*ad hoc*’ rigidities employed by Old

Keynesians. Generally, New Keynesians do not question the underlying ‘classical’ vision.

Post Keynesians have always questioned the ‘classical’ vision but have not succeeded as yet in agreeing on what the principle of effective demand is<sup>1</sup>. There should, however, be no grounds for misunderstanding of the principle of effective demand given Keynes’s exposition in the *General Theory* and Dillard’s (1948) synopsis. As Dillard (1948) explained, the principle of effective demand is the key theoretical innovation of the *General Theory*. In its most general form the principle of effective demand demonstrates that the rate of interest sets a limit to the profitable expansion of output before full employment is achieved. Keynes also argued in the *General Theory* that there was no mechanism in a *laissez faire* monetary economy for automatically generating the natural rate of interest consistent with full employment; as he had believed when writing the *Treatise*. Consequently, a monetary entrepreneur economy (*laissez faire* capitalism) is one where the rate of interest would be too high to achieve full employment. This is a *structural* and *not a cyclical* problem.<sup>2</sup>

Keynes’s diagnosis of a *laissez faire* monetary economy is that it suffers from two related structural flaws. These can be summarized crudely by the statement that the expected or ‘normal’ rate of interest is too high and the rate of investment is too low. As it is the rate of interest that ultimately determines the point of effective demand and long-period

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<sup>1</sup> Contrast Rogers (1989, 1999, 2006) with Amadeo (1989) or Davidson (2002)

<sup>2</sup> This does not mean that Keynes ignores the business cycle. Keynes (1936) explains the cycle in terms of fluctuations in the marginal efficiency of capital not sticky wages or prices.

equilibrium, the economy may fluctuate for decades about a level of activity too low to generate full employment because the expected 'normal' rate of interest is too high.

Keynes's policy proposals follow directly from the principle of effective demand. They consist of two suggestions to *change the structure* of a *laissez faire* monetary economy. On the one hand the 'socialization of investment' was a proposal to increase state involvement in economic management with the objective of increasing the expected return on capital (the marginal efficiency of capital) and reducing the risk so as to 'crowd-in' private sector investment. These proposals have been well documented by Kregel (1985) and others. On the other hand there was a largely unnoticed proposal that the central bank would have to take control of and lower the expected 'normal' rate of interest.<sup>3</sup>

The great irony of modern macroeconomics is that despite the rejection of Keynes's theory the structural changes he recommended have indeed been implemented - albeit without any grasp of the theoretical foundation on which they were based. Today central banks are indeed under public control and the 'socialization of investment' has become a permanent feature of most western economies, including the United States. The explanation for this apparent paradox was provided by Keynes himself when he observed that once his policy proposals had been implemented some aspects of 'classical' economics would come back into their own. In particular Keynes always stressed the

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<sup>3</sup> Minsky (1986) had a clear grasp of the intention behind Keynes's policy proposals and Tily (2007) highlights the importance of Keynes's 'cheap money' policy.

need for aggregate price stability in a monetary economy once full employment had been achieved. But there are risks for theorists and policy makers who ignore the principle of effective demand and work with the ‘classical’ special case.

The remainder of this chapter deals with the implications of these developments for the assessment of post Keynesian monetary theory. Section II briefly summarizes Keynes’s principle of effective demand as outlined by Dillard (1948), Kregel (1983) and Rogers (1989) and sketches the limitations of some post Keynesian versions of the principle of effective demand. Part III explains how Keynes’s policy proposals follow from his principle of effective demand. Section IV examines recent analysis of interest rate rules using the New Keynesian (NK) and Post Keynesian (PK) models. Section IV assesses these models from the perspective of the principle of effective demand. Section VI concludes that there is still much for monetary theorists to learn from the *General Theory*.

### **III Keynes’s vs Post Keynesian versions of the principle of effective demand**

Pasinetti (1997, p. 93) argues that Keynes never formally stated the principle of effective demand. Thus despite the fact that there was apparently general consensus that the principle of effective demand was the central innovation of the *General Theory*, there is no agreement on what the principle of effective demand actually is. In what follows it will be demonstrated that there should be no ambiguity and the principle of effective demand rests on the failure of the rate of interest to automatically adjust so that the point

of effective demand coincides with full employment, even if wages and prices are flexible in the long run.

Keynes's principle of effective demand is outlined in chapter 3 of the *General Theory* and can be explained with reference to Figure 1 which also provides a useful comparison with post Keynesian interpretations. The *D* and *Z* curves in Figure 1 are as defined by Keynes (1936, chapter 3) and illustrate the Marshallian pedigree of his analysis.<sup>4</sup> The ordinate in Figure 1 measures the aggregate demand and supply prices (ADP & ASP) for various levels of employment for a given technology, state of long-term expectations and a given money wage index. The schedules illustrated in Figure 1 cannot be derived without holding these factors constant.<sup>5</sup> This general form of the 'Keynesian Cross' is familiar to most Keynesians but Keynes's Marshallian interpretation and the principle of effective demand has disappeared from sight although Dillard (1948) and later Kregel (1976) provided a comprehensive overview of Keynes's methodology and theory.

The three key independent elements of Keynes's principle of effective demand are; (i) the propensity to consume of less than unity; the expected normal rate of interest behind which lies liquidity preference and banking policy; and (iii) the marginal efficiency of capital. All of these variables are psychological or behavioral and forward-looking. In Figure 1, firms earn normal profits along the *Z* or aggregate supply curve and the *D* curve

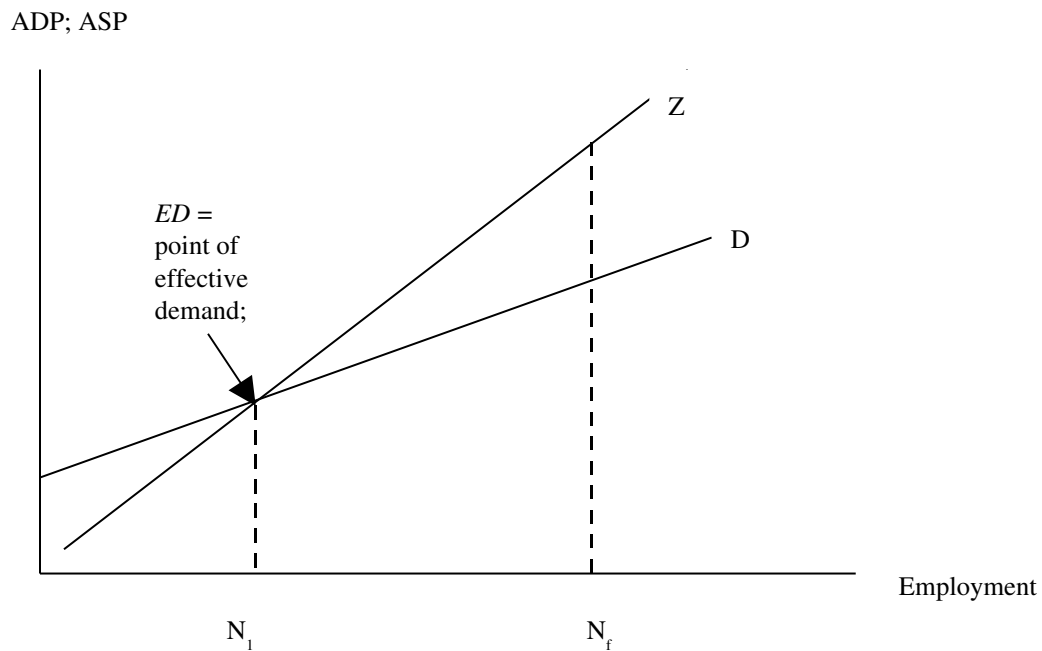
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<sup>4</sup> . Davidson (2007, appendix to chapter 6) provides a brief explanation of the derivation of the *D* and *Z* functions.

<sup>5</sup> As Kregel (1976) in particular, has noted, the *General Theory* contains a static model that defines this long-period equilibrium solution given assumptions about expectations and other factors held constant but not fixed

reflects that the propensity to consume is less than unity given the expected normal rate of interest and a marginal efficiency of capital.

**Figure 1** Keynes's principle of effective demand



Once the expected normal rate of interest<sup>6</sup> is set by the interaction between banking policy and the liquidity preferences of the private sector, at the point of effective demand *ED*, the marginal efficiency of capital adjusts to the rate of interest to determine long-period equilibrium where the *D* schedule cuts the *Z* schedule as illustrated in Figure 1. It

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<sup>6</sup> There is a self-fulfilling prophecy or 'bootstrap' dimension to Keynes's concept of equilibrium as outlined in Rogers (1999).

is then not profitable for firms to expand output beyond the point of effective demand. In terms of Figure 1, unilateral attempts by entrepreneurs to increase output and employment will depress aggregate demand prices below aggregate supply prices and losses will result. Output and employment will contract back to  $N_f$ . The point of effective demand can be shifted only by changes in one or more of the three independent elements. In that respect, Keynes identifies three properties of money that prevent the rate of interest from automatically adjusting to restore full employment in the long run.<sup>7</sup> Given a banking policy the properties of money interact with liquidity preference to make the rate of interest 'sticky'. In Keynes's opinion there is simply no market mechanism, as postulated by the classical theory, to generate the natural rate of interest such that the point of effective demand automatically coincides with full employment in the long run. A point of effective determined established by a 'wrong' rate of interest – a rate inconsistent with full employment – is inevitable in a *laissez faire* monetary economy.

Keynes (1936 p. 204) described the position as follows:

“It [the money rate of interest]<sup>8</sup> may fluctuate for decades about a level which is chronically too high for full employment; particularly if it is the prevailing opinion that the rate of interest is self-adjusting, so that the level established by convention is thought to be rooted in objective grounds much stronger than convention, the failure of employment to attain an optimum level being in no way associated, in the minds either of the public or the authority, with the prevalence of an inappropriate range of rates of interest.”

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<sup>7</sup> Dillard (1948, pp. 201-204) provides a concise discussion of these properties and their implications.

<sup>8</sup> In this paper the term 'rate of interest' refers to the term structure. Ultimately it is the long rate that determines investment but central banks today have direct control only of the short rate and seek to influence the long term rates indirectly. The technical question of control over long rates is not addressed in this paper.



Keynes (1936, chapter 3) makes it abundantly clear that it is the point of effective demand that determines employment, for example,  $N_l$ , and at that level of employment the marginal productivity of labor exceeds the marginal disutility of employment.

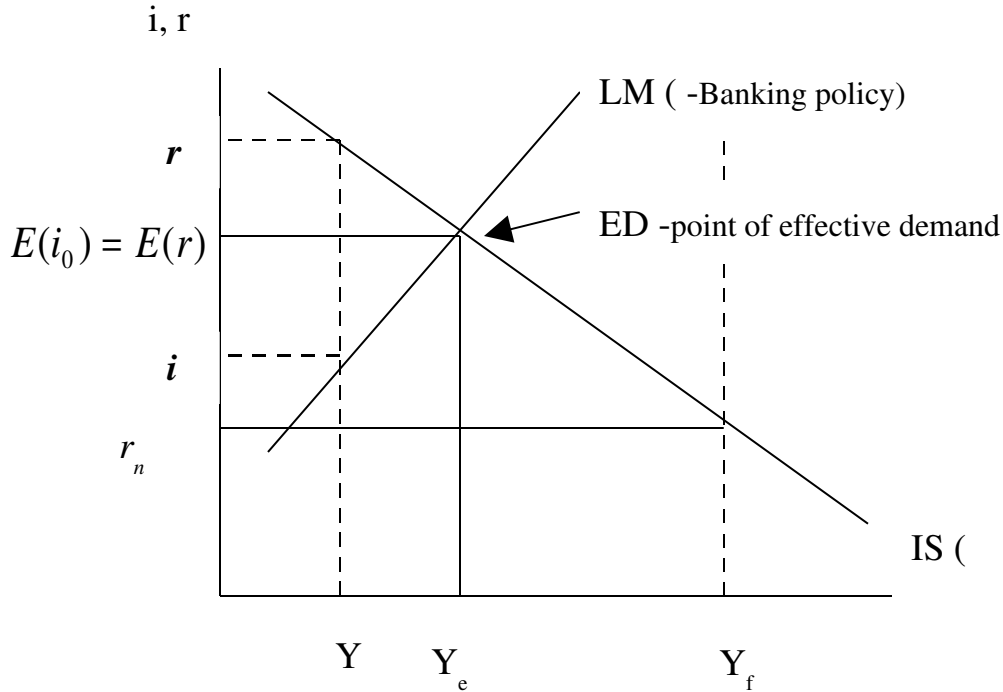
By contrast, a common post Keynesian interpretation of Keynes's analysis is represented by Amadeo (1989) who describes the principle of effective demand as the idea that it is changes in the level of income or activity and not the rate of interest that restores equality to saving and investment. This is fine as far as it goes but it leaves the role of rate of interest and the marginal efficiency of capital unaccounted for in what is usually presented as a short-period equilibrium interpretation of the *General Theory*. Similarly Davidson (2002, p. 22) interprets Keynes's (1936, p. 26-27) brief summary presented in chapter 3 of the *General Theory* to mean that Say's Law is only the view that the aggregate demand and supply relations coincide (the  $D$  and  $Z$  relations in Figure 1). Davidson then suggests that a propensity to consume of less than unity is *sufficient* to ensure equilibrium at less than full employment. But Keynes makes it clear in chapter 3 of the *General Theory* that the propensity to consume of less than unity is only a *necessary* condition and the rate of interest plays an essential role in determining the point of effective demand. In particular, Keynes (1936, p. 31) makes it clear that the failure of the rate of interest to automatically fall to the level consistent with full employment is to be a key element of his analysis: "...which brings us to the theory of the rate of interest and to the reasons why it does not automatically fall to the appropriate

level, which will occupy Book IV". Clearly he intends to restate this position repeatedly in later chapters of the *General Theory*.

Hence, it is apparent that Davidson (2002) is implicitly assuming something about the behavior of the rate of interest because it is not sufficient to assume a propensity to consume of less than unity to produce Keynes's long-period unemployment equilibrium. The fact that the propensity to consume is less than unity is a necessary element of Keynes' principle of effective demand but the existence of a long-period unemployment equilibrium rests on the behaviour of the rate of interest. Without Keynes's liquidity preference theory of the rate of interest there is nothing to stop the  $D$  curve sliding up the  $Z$  curve as postulated by the classical loanable funds theory of the rate of interest.

To sum up, recall that in its most general form the principle of effective demand is the idea that the rate of interest sets a limit to the profitable expansion of output before full employment is reached. Thus Say's Law fails, not because the propensity to consume is less than unity, or because changes in income is the mechanism that equates saving and investment, but because there is no market mechanism to select the optimum or the *unique* natural rate of interest as was the case in the *Treatise*. In other words, in *laissez faire* capitalism there is no 'capital' market, no saving and investment schedules, to determine a unique natural Wicksellian-type marginal efficiency of capital,  $r_n$ , towards which the rate of interest,  $i$ , will adjust and pull the economy to full employment in the long run.

In a *laissez faire* economy, the properties of money, banking system conventions and liquidity preference that establish the expected normal interest rate will inevitably be such that marginal efficiency of capital settles at a level which, in Keynes's aggregate Marshallian analysis, the demand prices of capital goods are driven to equality with their long-period supply prices before full employment is attained as Dillard (1948), Kregel (1976, 1983), Rogers (1989) and others have stressed. It is then not profitable for entrepreneurs' to expand output beyond the point of effective demand, unless the expected normal rate of interest falls, for any attempt to do so would involve them in losses by depressing demand prices below long-period supply prices. As Keynes (1936, p. 31) explains, a limit to the profitable expansion of production and employment can therefore occur even though the marginal product of labor exceeds the marginal disutility of labor – involuntary unemployment exists.



**Figure 2. Keynes's vision of long-period equilibrium in a *laissez faire* economy<sup>9</sup>.**

Consequently, another important feature missing from Keynesian economics is the distinction between the rate of interest and the marginal efficiency of capital.<sup>10</sup> Too often they are conflated and this effectively obliterates Keynes's principle of effective demand. The marginal efficiency of capital is a generalization of Wicksell's concept of the natural rate of interest to a monetary economy and Keynes's description of the point of effective demand is well captured by a Marshallian interpretation of the textbook IS-LM setup with a *fixed quantity* of money<sup>11</sup> A Marshallian interpretation of Keynes's analysis in

<sup>9</sup> A *laissez faire* economy is one where the government sector is too small a percentage of GDP to significantly influence the economy. Figure 2 arbitrarily selects 10% but a useful discussion of Keynes's analysis of the relevant proportions is provided by Kregel (1985).

<sup>10</sup> Tobin is the exception here although he fell back on Wicksell's notion of a unique natural rate consistent with long-run full employment equilibrium. Keynes (1936, p. 252) complained that 'classical' economists often conflated the two and this generated confusion.

<sup>11</sup> Bibow (2000b, p. 552) suggests, correctly in my view, that Keynes's assumption of a constant quantity of money in the *General Theory* stands for a *particular banking policy* which if different would result in a

terms of the familiar *IS-LM* structure is presented in Figure 2, where the *IS* curve is best interpreted as the schedule of the marginal efficiency of capital,  $r$ , in Keynes's model. Figure 2 incorporates the distinction between the rate of interest,  $i$ , and the marginal efficiency of capital,  $r$ , which is crucial to Keynes's principle of effective demand. In Keynes's stationary model, given a quantity of money (banking policy) the rate of interest is determined by the liquidity preferences of the private sector. The expected normal rate of interest,  $E(i_0)$  is the key independent variable. The analysis is causal and not simultaneous.<sup>12</sup> In Marshallian terms, at a short-period equilibrium income level  $Y$  it follows that  $i < r$  and the economy expands to long-period equilibrium where,  $i = r$ . By contrast, the classical theory has the rate of interest,  $i$ , adjusting automatically to the unique 'natural' marginal efficiency of capital,  $r_n$ , (i.e. the marginal efficiency of capital consistent with full employment) in the long run. But Keynes's principle of effective demand reveals that there are many long-period resting places for Wicksell-like 'natural' marginal efficiencies of capital along this *IS* curve. In particular, Keynes (1936, pp. 242-244) explained why his belief in a unique Wicksellian-like natural rate in the *Treatise* was misplaced.

So once the normal rate of interest settles at  $E(i_0)$  the point of effective demand is *ED* (in both Figures 1 & 2) – a long-period equilibrium - and no amount of flexibility in the rest of the system can shift this equilibrium automatically to coincide with full employment. Such coincidence may occur by chance. It should also be apparent that there is no sense

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different long-period equilibrium. See also Panico (2006).

<sup>12</sup> Hoover (2005) provides a recent and comprehensive assessment of Keynes's causal analysis.

in which money is neutral in Keynes's analysis as the monetary regime and the behavior of the banking system may be such as to produce a point of effective demand that is inconsistent with full employment. That the behavior of the banking system plays a key role determining the point of effective demand is stated explicitly by Keynes (1979, p.55)<sup>13</sup>: "On my view, there is no unique long-period position of equilibrium equally valid regardless of the character of the policy of the monetary authority".

Hence, Keynes's long-period unemployment equilibrium is a consequence of the failure of the rate of interest to adjust as postulated by 'classical' theory. The distinction between  $i$  and  $r$  is therefore central to the principle of effective demand and to Keynes's view of the trade cycle which he attributed largely to fluctuations in  $r$ , the marginal efficiency of capital, relative to the rate of interest.<sup>14</sup> In contrast, the loanable funds theory postulates that the demand and supply for money loans is brought into equilibrium, in a perfectly competitive market, such that the rate of interest is always equal to the natural rate as postulated by Wicksell or Keynes in the *Treatise*. In terms of Figure 2 a loanable funds interpretation of the model has the LM curve cutting the IS curve always at  $r_n$ , the *unique* natural rate of interest in the long run.<sup>15</sup>

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<sup>13</sup> Lying behind this view is Keynes's (1936, p. 351) conviction that the rate of interest is not self-adjusting to a level consistent with the social advantage but had a tendency, if unrestrained, to rise too high.

<sup>14</sup> Keynes (1936, p. 352) was critical of classical theory for often conflating the rate of interest and the marginal efficiency of capital. In an early draft of the *General Theory* he included the distinction between the rate of interest and the marginal efficiency of capital in his equations. See Keynes (1973, Part I p.483).

<sup>15</sup> Bibow (2000a, 2001) provides a telling analysis of the failure of the loanable funds theory on its own terms.

Thus Keynes's static model of the *General Theory* is a model of long-period unemployment equilibrium where that equilibrium results from a rate of interest that is too high for full employment. In Keynes's opinion a *laissez-faire* economy may fluctuate for decades about such long-period equilibria. The principle of effective demand provides the theoretical framework for that opinion and clearly the *General Theory* is not just another model of the business cycle, as many Keynesians believe, but a theory that identifies a structural failure inherent in *laissez-faire* capitalism. In Keynes's view, failure of the rate of interest to find its unique Wicksellian optimal or natural rate,  $r_n$ , at full employment was inevitable in a *laissez faire* economy. In such a system equilibrium at full employment would be an accident.

### **III Policy implications of the principle of effective demand: socialization of investment and public control of the green cheese factory**

Keynes's policy recommendations now follow from his theory. On the fiscal side, the 'socialization of investment' aims to stabilize aggregate demand and lift the rate of return on private sector investment. On the monetary side, public control of the central bank is necessary to lower the expected normal rate of interest. Monetary management cannot be avoided and there is no alternative but to convince the public that the central bank can manage the monetary system so as to produce a lower expected 'normal' rate of interest.

This proposal is mentioned only briefly in the *General Theory* when Keynes (1936, p. 235) makes an enigmatic reference to the green cheese factory.

“Unemployment develops, that is to say, because people want the moon; - men cannot be employed when the object they desire (i.e. money) is something which cannot be produced and the demand for which cannot be readily choked off. There is no remedy but to persuade the public that green cheese is practically the same thing and to have a green cheese factory [i.e. a central bank] under public control.”

These two policy proposals are complementary. The ‘socialization of investment’ was essential because without it the variation in the marginal efficiency of capital would be too great to be offset by movements in the rate of interest. The ‘socialization of investment’ proposed by Keynes was thus intended to achieve two objectives; (i) increase the size of government as a proportion of GDP so that it was large enough relative to GDP to stabilize aggregate demand, and (ii) undertake infrastructure investment on a long view and in the public interest so as to ‘crowd-in’ private sector investment. Details of Keynes’s proposals are discussed by Kregel (1985) and Rogers (2006b). Taken together these proposals lift the return and reduce the risk to private capital thereby reducing the volatility of the business cycle which is driven largely by fluctuations in the marginal efficiency of capital. A *laissez faire economy* has a government that is too small to underpin aggregate demand and has no *raison d’être* for undertaking infrastructure investment. Hence from Keynes’s perspective of the principle of effective demand a major role for government in public infrastructure investment is the *sine qua non* of the fiscal regime. The objective is to stabilize aggregate demand and ‘crowd-in’ private sector investment.



Although most of this has largely been forgotten by the current generation of economists, some do recognize the *stabilizing role of government size* but regard it as an intriguing stylized fact. As Andres, Domenech and Fatas (2004, emphasis added) note:

‘There is substantial evidence that countries or regions with large governments display less volatile economies, as shown in Gali (1994) and Fatas and Mihov (2001). This is not only *an intriguing fact* for macroeconomists but one that has implications regarding the models we use to analyze economic fluctuations.’

Of course modern neoclassical complete markets models have no role for government, irrespective of its size, so any evidence that its role may be important is intriguing. The importance of size and the objectives of the fiscal regime in changing the structure of the *laissez faire* economy are however all implications of Keynes’s principle of effective demand.

Thus there is an explicit relationship between monetary and fiscal regimes in Keynes’s policy proposals. In particular, for Keynes fiscal policy was not primarily concerned with fine-tuning the business cycle but with underpinning the level of aggregate expenditure so as to lift the rate of return and reduce the risk on private capital. Once that structural change had occurred monetary policy, in the guise of public control of the central bank could bring down the expected normal rate of interest. To treat the money supply as exogenous in the sense of the old neoclassical consensus would be the equivalent to handing monetary policy over to the general public and the private banks with the inevitable result that the point of effective demand would be consistent with full employment only by chance.

Public control of the central bank is therefore the second leg of the structural change required to transform and stabilize the *laissez faire* economy.<sup>16</sup> For Keynes, control of the rate of interest is paramount. This means inevitably that money is an endogenous variable, more a flow than a stock. The nature of the endogeneity of the money supply is something over which there is some disagreement in post Keynesian circles. How the structuralist and horizontalist positions may be reconciled and/or relate to aspects of Keynes's monetary analysis is well documented by Bibow (2000b) and Panico (2006) and is not of major concern here. From the perspective of this paper the key issue is the control of the rate of interest by the central bank. The role of liquidity preference theory as the key element of the principle of effective demand is what differentiates Keynes's theory on the long-period non-neutrality of money from the neutral money doctrines of all conventional monetary theory. As Rogers and Rymes (2000) argue, Keynes in the *Treatise* was well aware of the analytical features of the 'ideal central bank of the future'. See also Bibow (2000b p. 546). The key feature of this system is the role of the central bank as the monopoly supplier of money or clearing balances. That places the central bank in a position to impose losses on private banks and they manage cash flows accordingly. In such a system the central bank can control the bank rate and make it

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<sup>16</sup> The need for a managed currency is not an innovation of the *General Theory*. As Bibow (2000b) explains, Keynes had already reached that conclusion in the *Tract*. In the *Treatise* Keynes thought that monetary management could guide the system to its unique natural rate of interest consistent with full employment. What changes in the *General Theory* is the absence of a unique natural rate so the market rate set by the banking policy and liquidity preference determines long-period equilibrium.

effective without any additional quantitative restrictions on banks and such systems are now in place in the modern world of electronic money.<sup>17</sup>

With this brief sketch of Keynes's theoretical vision and its policy implications in hand we turn to an examination of current New and post Keynesian monetary theory.

#### **IV Recent developments in Keynesian models with endogenous money**

In the realm of policy it is clear that central banks have adopted the rate of interest as their instrument for monetary policy in apparent vindication of the views of Kaldor, Moore and Keynes. Today, Romer (2000) has convinced many that macroeconomics without the LM curve is a useful approach. See Delong (2000). However, as Arestis and Sawyer (2005), Rogers (2006a) and many have also noticed, there is no new monetary theory involved and interest rate rules simply replace money supply targets in the context of what is an unchanged 'classical' general equilibrium structure. The deeper conceptual and theoretical problems inherent in neoclassical monetary theory remain unresolved in this 'classical' vision. Nevertheless, the fact that central banks now take responsibility for setting short term interest rates helps to understand monetary policy from the perspective of Keynes's principle of effective demand.

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<sup>17</sup> Bibow (2000b, p 554) notes that it was clear by the time of the *General Theory* (1936, p.205) that Keynes had concluded that the central bank could easily control the short rate of interest. The important problem was keeping the long rate down.

This section briefly outlines Setterfield's (2003) baseline New Keynesian (NK) and post Keynesian (PK) models before assessing the PK model from the perspective of Keynes's principle of effective demand.

*A baseline NK model; neutral endogenous money*

Setterfield (2003) presents a now familiar NK model (often described as a New Consensus model). The model is described by equations (2.1) to (2.3) below.

$$g = g_0 - \beta r \quad (2.1)$$

$$\pi = \pi_{t-1} + \gamma(g - g_n)_{t-1} \quad (2.2)$$

$$r = r_{t-1} + \delta(g - g_n) + \alpha(\pi - \pi^T) \quad (2.3)$$

where  $g$  and  $g_n$  are the actual and natural rates of growth of real output,  $r$  is the real rate of interest set by the central bank<sup>18</sup>,  $\pi$  is the actual rate of inflation and  $\pi^T$  is the central bank's inflation target.

Equation (2.1) is a growth form of an *IS* relationship where  $g_0$  represents an autonomous component of real growth, due to fiscal policy or the trade balance, while  $-\beta r$  captures an endogenous component as growth responds to movements in the real rate of interest. Equation (2.2) is a simple Phillips curve with inflation responding to the lagged output gap. The idea is that it takes time for workers and firms to respond and adjust nominal

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<sup>18</sup> The central bank sets a nominal rate but if it follows the Taylor Principle and adjusts the nominal rate more than the expected rate of inflation the real (=inflation adjusted) rate will change with changes in the nominal instrument.

values to pressure from the output gap. Equation (2.3) is an interest rate rule of the Taylor-type which describes how the central bank adjusts the real rate of interest to smooth the output gap and keep inflation close to the target. The parameters  $\delta$  and  $\alpha$  are the weights placed by the central bank on the output gap and the inflation gap.

Equilibrium in the model is achieved when inflation is consistent with the central bank's target, ( $\pi = \pi_{t-1} = \pi^T$ ) which from equation (2.2) means that  $g = g_n$  and from equation (2.3) that  $r = r_{t-1} = r^*$ . Hence *in equilibrium* we can write:

$$g = \overline{g_n} = g_0 - \beta r^* \quad (2.1')$$

and  $r^* = (g_0 - g_n) / \beta$

As Setterfield (2003) explains, this model has all the 'classical' properties of real equilibrium but lacks the Pigou effect – there is no outside money. The natural rate of growth is determined independently of monetary or fiscal policy. For example, if inflation occurs in this model due to positive output gap in the previous period (equation (2.2)) the central bank will raise the real rate of interest as dictated by equation (2.3) and by equation (2.1) the rate of growth of real output will fall eliminating the output gap. Thus money, inflation and monetary policy exhibit long-run neutrality even though the money supply is endogenous. Similarly, there is complete crowding out of fiscal policy. Fiscal policy is embedded in the autonomous component of growth,  $g_0$  so an expansionary fiscal policy, from equilibrium, is completely neutralized by the rise in the equilibrium real rate of interest. From the equilibrium state (2.1') when  $g_0$  increases

there is an offsetting fall in the endogenous component of growth,  $-\beta^*$  to maintain  $g = \bar{g}_n$ . This property of fiscal policy in the NK model is consistent with most Keynesian models where fiscal policy is aimed only at smoothing the business cycle. There is no scope for Keynes's socialization of investment in New or Old Keynesian models because there is no principle of effective demand and unique long-period equilibrium at full employment is assumed.

*A baseline PK model; non-neutral endogenous money*

Setterfield (2003) also presents a PK model that exhibits long-run non-neutral money. In that respect it is in the tradition of the *General Theory*. How the two are related will be examined in the next section. Here we concentrate on teasing out the properties and implications of the model.

The corresponding three equations for the PK model are listed below as equation (2.6) to (2.8).

$$g = g_0 - \beta r \quad (2.6)$$

$$\pi = \phi \pi_{-1} + \gamma g + Z \quad (2.7)$$

$$r = r_{t-1} + \alpha(\pi - \pi^T) \quad (2.8)$$

where  $Z$  is a vector of institutional variables the effect aggregate wage and price setting behavior,  $0 < \phi < 1$  and the other variables are as defined for the NK model.

The PK model differs from the NK model by the absence of an exogenous natural rate of growth,  $g_n$ , the fact that the equilibrium rate of growth is demand constrained so monetary policy is never neutral, and there is scope for an autonomous changes in the wage bargaining process to impact on inflation through  $Z$  in equation (2.6). These features of the model mean that the long-run Phillips Curve is *not* vertical. The Phillips Curve in the PK model is derived by imposing the condition for stationary inflation  $\pi = \pi_{t-1}$  to obtain:

$$\pi = \frac{Z}{1-\phi} + \frac{\gamma}{1-\phi} g \quad (\text{PK Phillips Curve})$$

The equilibrium solution to the model is derived from the condition where steady inflation occurs at the target rate  $\pi = \pi_{t-1} = \pi^T$ . In that case the equilibrium real interest rate is  $r = r_{t-1} = r^*$  from the interest rate rule, equation (2.8), and from the Phillips Curve, equation (2.7), the equilibrium real rate of growth is:

$$g^* = [(1-\phi)\pi^T - Z] / \gamma \quad (2.9).$$

Substituting the IS-type relationship,  $g^* = g - \beta r^*$ , into (2.9) produces the expression for the equilibrium real rate of interest to be set by the central bank, given its inflation target,  $\pi_T$ .

$$r^* = [\gamma g_0 - (1 - \phi)\pi^T + Z] / \gamma \quad (2.10)$$

Expression (2.10) reveals that the equilibrium real interest rate set by the central bank is a positive function of the autonomous growth element, and hence fiscal policy, the wage and price setting arrangements and a negative function of the target rate of inflation. This relationship means that the lower the inflation target the higher the equilibrium real rate of interest and the higher the equilibrium real rate of interest the lower the equilibrium growth rate. Long-run neutrality is lost as the equilibrium growth rate is a function of the inflation target.

#### **IV Assessment of post Keynesian monetary economics**

The long-run non-neutrality of money in the PK model is a step towards Keynes's principle of effective demand. But it doesn't quite go far enough.

Consider, first, the role of the fiscal regime in the PK model sketched above. Recall that the fiscal regime is embedded in the autonomous component of growth  $g_0$ . Examination of the model and the role of fiscal regime reveal that it exhibits complete crowding out. There are two effects at work; one operates directly to shift the *IS*-type relationship irrespective of the real rate of interest, as indicated by equation (2.6) and one which operates to increase the equilibrium real rate of interest,  $r^*$  as indicated by expression (2.10). In other words we have  $\partial g / \partial g_0 > 0$  (from equation (2.6)) and



$\partial r^* / \partial g_0 = 1 / \beta > 0$  (from equation (2.10) so what is the net effect? From the *IS*-type relationship,  $g^* = g_0 - \beta r^*$  we can see that the net effect is zero as  $\partial g^* / \partial g_0 = 1 - \beta \partial r^* / \partial g_0 = 0$  because  $\partial r^* / \partial g_0 = 1 / \beta$ . There is complete long run crowding-out of fiscal policy.

This result follows from the absence of the principle of effective demand – specifically, the absence of the distinction between the rate of interest and marginal efficiency of capital. In Keynesian models with a single rate of interest the principle of effective demand inevitably disappears.

To re-interpret the PK model from Keynes’s perspective it is necessary to introduce the distinction between the rate of interest controlled by the central bank and the marginal efficiency of capital. In models that fail to distinguish between the cost and return on capital changes in fiscal policy appear as changes in the *cost of capital* when the objective of fiscal policy should be to increase the *return on capital* relative to the cost. The point is easily illustrated by a minor extension of Setterfield’s PK model to distinguish between the rate of interest,  $i$ , under the control of the central bank and the Keynes’s marginal efficiency of capital,  $r$ . Both variables are measured in inflation adjusted or real terms for a given state of long term expectations. The model then appears as follows<sup>19</sup>.

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<sup>19</sup> Recall that in preparation for the *General Theory* Keynes proposed to include the rate of interest and the marginal efficiency of capital in all his equations.

$$g = g_0 - \beta(i - r) \quad (2.6')$$

$$\pi = \phi \pi_{t-1} + \gamma g + Z \quad (2.7')$$

$$i = i_{t-1} + \alpha(\pi - \pi^T) \quad (2.8')$$

Equation (2.6') allows for both the negative impact of increases in the cost of capital, represented by the interest rate,  $i$  and for a positive impact of an increase in the rate of return on capital, represented by the marginal efficiency of capital,  $r$ . In equilibrium  $i^* = r^*$  but it is  $i^*$  that is under the control of the central bank and the marginal efficiency of capital generally adjusts to the rate of interest,  $i^*$  in long-period equilibrium. In this scheme, equilibrium is determined by the value selected for  $i^*$  so equilibrium growth is again a function of the inflation target in this model. Given the inflation target is achieved in equilibrium with  $i^* = r^*$  the impact on equilibrium growth,  $g$ , of changes in fiscal regime (embedded in  $g_0$ ) can be isolated. Assuming  $\partial r / \partial g_0 > 0$ , a fiscal regime aimed at increasing the marginal efficiency of capital will have a positive impact on growth as long as the central bank does not increase the rate of interest to choke off the investment. Formally we get the following results:

$$\partial g / \partial g_0 = 1 - \beta(\partial i / \partial g_0) + \beta(\partial r / \partial g_0) \text{ so } \partial g / \partial g_0 > 0 \text{ when } \beta(\partial r / \partial g_0) > \beta(\partial i / \partial g_0).$$

Although parsimonious the model in (2.6')–(2.8') captures the consequences of the principle of effective demand and allows for a simple illustration of Keynes's policy

proposals –a fiscal regime to increase the return on capital and a central bank in control of the rate of interest. The equilibrium growth rate generated by the model is then dependent on the rate of interest set by the central bank once the inflation target has been set. A low inflation target means a higher equilibrium interest rate and lower real growth rate. Moreover, there is nothing in the model to ensure that the rate of interest produced by (2.8') will produce  $g = g_n$ . However, it is possible for a change in fiscal regime to lift growth by lifting the return on capital without any impact on the rate of interest. The distinction between the marginal efficiency of capital and the rate of interest is necessary to see that an increase in the marginal efficiency of capital is not the same thing as an increase in the real rate of interest. This is an elementary point but one that is often overlooked.<sup>20</sup> An increase in the marginal efficiency of capital will lead to an increase in capacity if the rate of interest is not increased. Crowding out is not inevitable as was the case in models that don't distinguish between  $i$  and  $r$ , i.e., the vast majority of Keynesian models. In a growing economy it is the case that  $i < r$  so investment is positive and the capital stock is growing.

The outline of the principle of effective demand sketched above identifies the key role of the monetary and fiscal regimes in determining the performance of the economy. These regimes are the context in which cyclical monetary and fiscal policy is implemented. The operating objectives of monetary and fiscal policy then reflect the conventions of the time and place. A monetary regime that emphasizes the control of the quantity of money, such

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<sup>20</sup> James Tobin is an obvious exception here although he did not embrace Keynes's principle of effective demand and retained the notion of unique long-period equilibrium.

as the gold standard, or targeting monetary aggregates, leaves the rate of interest to be determined by the international markets and the liquidity preferences of the private sector. The conventions that guide the implementation of monetary policy will then produce a rate of interest determined by the private sector but there is no reason why that rate should produce a point of effective demand consistent with full employment.

The consequences of such monetary policy regimes depend on the associated fiscal regime. If government has expanded its role to underpin aggregate demand and the rate of return on capital, something which is taken for granted in most economies these days, the sub-optimal performance of the economy may well be limited. The major structural change that occurred to western economies in the post war period was a structural adjustment of this sort. It has been noted in the literature that the increased role for government in macroeconomic management and the associated increased size of the government component of GDP contributes to stability. Without the fiscal regime change the consequences of an inappropriate monetary regime could be more serious.

Seen from this perspective it is apparent most modern economies have adopted Keynes's monetary and fiscal regimes without a full understanding of their theoretical basis. Many economists have lost sight of the importance of the fiscal regime in lifting and stabilizing,  $r$ , and the real long run consequences of monetary policy go unrecognized under the mistaken *belief* in the long-run neutrality of money. Although ironic, the consequences of this oversight are important. The fact that Keynes's policy revolution has occurred

without any understanding of its theoretical basis leaves policymakers vulnerable. In particular the view that the monetary regime and monetary policy are neutral in the long run is not only false but dangerous because it encourages the belief that price stability is sufficient to achieve macroeconomic stability.

An interesting example where the belief in the long-run neutrality of money has led to a dysfunctional monetary and fiscal regime is the European Union. The monetary policy strategy of the European Central Bank (ECB) and the Growth and Stability Pact, which effectively constrains national fiscal policies and precludes any Euro-wide fiscal policy, has been widely and rightly criticized by many economists, e.g. De Grauwe (2006). From the perspective of the principle of effective demand presented in this essay the monetary and financial system of the European Union appears to have been designed for failure.

On the fiscal side, the absence of any coherent Euro-wide fiscal policy in principle leaves the marginal efficiency of capital to luck and the ‘animal spirits’ of the private sector. In practice the matter may be less serious as tax and other policies are coordinated across Europe and tacit violation of the Stability Pact targets by national governments is allowed. On the monetary front the low level and asymmetrical nature of the inflation target set by the ECB creates self-inflicted credibility problems, and imparts an upward bias to interest rates that is widely perceived as a constraint on growth. Bibow (2005) likens it to driving a Ferrari with a foot permanently on the brake. From the perspective

of the principle of effective demand it is apparent that the ECB strategy forces up the expected normal rate of interest producing a point of effective demand that inhibits growth in the absence of a buoyant marginal efficiency of capital.

As Bibow (2005) also explains, the dual objectives of price stability and high employment required by the Treaty on European Union have been conflated by the ECB into the single objective of price stability. What is more ironic, the ECB has been cut free from public control in the name of central bank independence! The rationale provided by the ECB for this monetary strategy is the argument that price stability is sufficient to achieve full employment and slow growth in the Euro-zone is due to rigidities in labor markets. Clearly, the wheel has come full circle here to Keynes's debate with the classics. The theoretical justification for the ECB's position comes directly from the academic scribbling of the new classical economists and reflects the view that price stability is *the only* objective of monetary policy – short and long-run neutrality of money rules! The principle of effective demand tells us that this view is false. Price stability is important but not the only objective of monetary policy. Even those who believe in long-run neutrality allow for short run non-neutrality. That fact is also reflected in the behavior of most other central banks who implement a more flexible version of inflation targeting even though they lack the theoretical framework to support their intuitive grasp of the principle of effective demand.

## V Concluding Remarks

Keynesians of all shades have placed themselves at a disadvantage by failing to incorporate the principle of effective demand as outlined in this chapter. Without the principle of effective demand Keynesians cannot establish the case for long run non-neutrality of the policies of the central bank – one of the central elements of Keynes’s *General Theory*. Consequently they also overlook the significance of Keynes’s policy proposals aimed at structural change of a *laissez faire* economy. These policy proposals contain two complementary elements; (i) the ‘socialialization’ of investment to raise and stabilize the marginal efficiency of capital and (ii) the need for the central bank to bring down the expected normal rate of interest. Both of these structural changes occurred post WWII, albeit largely by default as the understanding of their theoretical basis has been lost.

But without a grasp of the theory there are obvious risks. The risks arise even in post Keynesian models without the principle of effective demand. Models that fail to distinguish between the rate of interest and the marginal efficiency of capital cannot incorporate Keynes’s analysis of fiscal policy and inevitably produce complete long-run crowding out. On the monetary side post Keynesian models now incorporate the non-neutrality of money but do so without incorporating Keynes’ principle of effective demand. This limits their effectiveness in exposing the weakness of New Keynesian models which also incorporate endogenous money. Endogeneity of money is obviously not the defining characteristic of Keynes’s analysis but a necessary implication if the

central bank is to gain control of the rate of interest. The theoretical significance of such control is readily apparent once the principle of effective demand is understood.



## References

- E. J. Amadeo, *Keynes's principle of Effective Demand*, (Edward Elgar: Aldershot, 1989).
- J. Andres, R. Domenech and A. Fatas, 'The Stabilizing Role of Government', INSEAD, working paper, 2004/44/EPS.
- P. Arestis and M. Sawyer, "New Consensus Monetary Policy: an appraisal", in *The New Monetary Policy*, eds. Phillip Arestis, Michelle Baddeley and John McCombie, (Cheltenham UK: Edward Elgar, 2005).
- J. Bibow, 'The Loanable Funds Fallacy in retrospect', *History of Political Economy*, 32:4, 789-831, 2000a.
- J. Bibow, 'On exogenous money and bank behaviour: the Pandora's box kept shut in Keynes's theory of liquidity preference', *The European Journal of the History of Economic Thought*, 7:4 532-568, 2000b.
- J. Bibow, 'The loanable funds fallacy: exercises in the analysis of disequilibrium', *Cambridge Journal of Economics*, 25, 591-610, 2001.
- J. Bibow, 'Europe's Quest for Monetary Stability: Central Banking Gone Astray', The Levy Economics Institute of Bard College, Working Paper No. 428, 2005.
- P. Davidson, *Financial Markets, Money and the Real World*, (Edward Elgar: Cheltenham, 2002).
- P. Davidson. *John Maynard Keynes*, (Palgrave, Macmillan: London, 2007).
- D. Dillard. *The economics of J. M. Keynes: the theory of a monetary economy*, (Crosby Lockwood and Son Ltd: London, 1948).

- P. De Grauwe, 'Flaws in the Design of the Eurosystem?' *International Finance*, 9:1, 137-144, 2006.
- B. J. DeLong, How to Teach Monetary Policy: Do Central Banks Set the Interest Rate, or Do They Target the Money Stock? 2000, <http://www.j-bradford-delong.net/>
- K. Hoover, 'Dr Keynes: Economic Theory in a Diagnostic Science', in the *Cambridge Companion to Keynes*, ed. Roger Backhouse and Bradley Bateman, (Cambridge: Cambridge University Press, 2006).
- J. M. Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936).
- J. M. Keynes, *The Collected Writings of John Maynard Keynes, The General Theory and After, Part I: Preparation*, Vol XIII, ed. Donald Moggridge (London: Macmillan, 1973).
- J. M. Keynes, *The Collected Writings of John Maynard Keynes, The General Theory and After, Part II: Defence and Development*, Vol XIV, ed. Donald Moggridge (London: Macmillan, 1973).
- J. M. Keynes, *The Collected Writings of John Maynard Keynes, A Supplement*, Vol XXIX, ed. Donald Moggridge, (London: Macmillan, 1979).
- F. Knight, 'Unemployment and Mr Keynes' Revolution in Economic Theory', 1937, reprinted in *John Maynard Keynes: Critical Assessments*, Vol. II, ed. J. C. Wood (London: Croom Helm, 1983).

- J. A. Kregel. "Economic Methodology in the Face of Uncertainty: The Modelling Methods of Keynes and the Post Keynesians", *Economic Journal*, 1976, 86, 209-25.
- J. A. Kregel, 'Effective demand: Origins and Development of the Notion', in *Distribution, Effective Demand and International Economic Relations*, ed. J. A. Kregel, (London: Macmillan, 1983, 50-68).
- J. A. Kregel, Budget Deficits, Stabilization Policy and Liquidity Preference: Keynes's Post-War Policy Proposals, in *Keynes Relevance Today*, ed. Fausto Vicarelli, (London: Macmillan, 1985).
- D. Laidler, *Fabricating the Keynesian Revolution*, (Cambridge University Press: Cambridge, 1999).
- H. Minsky. *Stabilizing and Unstable Economy*, (Yale: Yale University Press, 1986).
- Lugi, L. Pasinetti, 'The principle of Effective Demand', in G.C. Harcourt and R. Riach (eds.) *A 'Second Edition' of the General Theory*, (Routledge: London, 1997).
- C. Rogers, *Money Interest and Capital, A study in the foundations of monetary theory*, (Cambridge: Cambridge University Press, 1989).
- C. Rogers. "Self-fulfilling Expectations and the *General Theory*", *History of Economics Review*, 25, pp.172-183, 1999.
- C. Rogers. "Exogenous interest rates in modern monetary theory and policy: Moore in perspective", in: *Complexity, Endogenous Money and Exogenous Interest Rates, Festschrift for Basil J. Moore*, (Edward Elgar: London, 2006a.)

- C. Rogers, “The principle of effective demand: the key to understanding the *General Theory*”, paper presented at the IEA Conference: Keynes’s *General Theory* after 70 years, Santa Colomba and Siena, July 3 – 6, 2006b.
- C. Rogers and T. K. Rymes, ‘The disappearance of Keynes’s nascent theory of banking between the Treatise and the General Theory’, in, *What is Money?* ed. by John Smithin, (Routledge: London, 2000).
- D. Romer, ‘Keynesian Macroeconomics without the LM curve’, *Journal of Economic Perspectives*, Volume 14, Number 2, Spring 2000.
- M. Setterfield, ‘Central Banking, Stability and Macroeconomic Outcomes: A Comparison of New Consensus and Post-Keynesian monetary Macroeconomics’, in *Central Banking and the Modern World*, ed. by Marc Lavoie and Mario Seccareccia, (Edward Elgar: Cheltenham, 2006).
- G. Tily. *Keynes’s General Theory, the rate of interest and ‘Keynesian Economics’*: *Keynes Betrayed*, (Palgrave Macmillan: London, 2007).