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NOTES

The paper has benefited from the helpful comments on an earlier draft by Sally Dunton, two anonymous referees and the editor.

1. Card and Krueger [1992] also address this issue. Their data suggest private school effects with the percent of students enrolled in private schools by state and pupil-teacher ratios for public and private schools. Their results indicate a positive but insignificant relationship between the percent private variable and the returns to education. They conclude that any sectoral effects on the returns to education are explained by pupil teacher ratios, and term length.

2. We estimate the model with the selectivity correction. These results, available from the authors upon request, are consistent with those reported below.

3. The use of the natural log of wages in the estimation of hourly wages. Hence, the coefficients are interpreted as the percent change in wages given a unit change in the independent variable.

4. Gaudet and Griffin (1993) mention private education as one of several measures of child quality, but they do not include it in their empirical analysis. The results in Table 2 indicate that private education is a relevant factor in determining wages.

5. Gaudet and Griffin (1993) use this approach to test a productivity of schooling or child quality theory. They include several family background, student performance (high school GPA and standardized test scores), and school characteristics in the earnings equations. Many of these factors have a significant effect on earnings in a pooled model, but most are not significant when the data is stratified by race. Their primary finding is that the returns to education coefficients decline when controlling for family background, student performance, and school characteristics, which is consistent with the child quality or productivity of schooling hypothesis.

6. Hanushek [1986] reports that pupil teacher ratios have inconsistent impacts of the performance of students on standardized tests.

7. For example, Card and Krueger [1992] find no private sector effect on the returns to education when controlling for pupil-teacher ratios and term length. The difference in findings may be due to the time periods of the studies. Card and Krueger use cohorts born between 1920 and 1935. These groups would have finished high school from approximately 1938 to 1947. This paper uses respondents who would have been in high school in the 1970s and 1980s. The relative quality of public and private schools could have changed substantially between these periods.

REFERENCES

macroeconomic approaches in terms of a common simple framework. We hope to convince others not to join Barro in abandoning what can be a useful teaching device. Our main disagreement with Barro does not concern pedagogical issues, however; for Barro’s paper is not primarily about how one should teach a given material. Underlying the discussion of teaching tools loom substantive issues of economic theory. In Barro’s view there are currently only “two types of internally-consistent models that allow for cyclical interactions between monetary and real variables” (1984, 4): the fix-price models associated with the work of Barro and Grossman [1976] and others, and the new classical models of market clearing.

This position is blatantly wrong. In fact, Barro (somewhat inconsistently) acknowledges the existence of other types of models elsewhere in his paper when he refers to “what used to be called the complete Keynesian model” [ibid., 1]. Barro does not criticize this model on grounds of internal inconsistency but suggests that the model “was rejected long ago for good reasons” [ibid., 1]. These reasons, we are told are partly theoretical (essentially that it does not capture some of the main Keynesian ideas) and partly empirical (it is inconsistent with the observed cyclical pattern for the real wage) [ibid., 4]. Barro’s theoretical criticisms are in our opinion unjustified, and the empirical objection — which has a long history going back to Dunlop [1938] and Tarshis [1989] and which applies to monetarist and new classical models as well — can be met by a straightforward reformulation of the theory to take account of imperfect competition and non-diminishing returns to labor.

The other aforementioned authors who have criticized the AS/AD framework have put forward their own suggestions about how the framework can be modified to free it of its internal inconsistencies and empirical shortcomings. Although we do not concern ourselves with the details of their arguments, we do comment on their work to the extent that it is directly related to the issues relevant for understanding the problems with Barro’s criticisms and our own interpretation of the AS/AD framework and models. We should say at the outset that we disagree with many of the claims made by these authors and our interpretation of consistent AS/AD models is significantly different from theirs.

The rest of this paper proceeds as follows. The next section uses a common AS/AD framework to illustrate simple versions of four well-known macroeconomic models. Drawing on this analysis, the subsequent section shows the weaknesses in Barro’s arguments and comments on some issues raised by the other authors.

**THE ASAD FRAMEWORK AND SOME ILLUSTRATIVE MODELS**

Since the “AS/AD models” are well known, our presentation can be extremely brief. We consider four models, the first three of which Barro discusses; reversing his order, we start with the traditional “complete Keynesian model.” Table 1 compares some of the central assumptions and implications of the models.

<table>
<thead>
<tr>
<th>Model</th>
<th>Ultra Short Run</th>
<th>Short Run</th>
<th>Long Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoclassical-Synthetic Keynesian</td>
<td>Firms’ price expectations and money wage given, output predetermined. Price varies to clear goods market.</td>
<td>Money wage given. Firms’ price expectations adjust to the actual price.</td>
<td>Money wage changes in response to unemployment. AS curve shifts. In equilibrium, AD and AS curves intersect at full-employment level.</td>
</tr>
<tr>
<td>(Price and interest rate always flexible)</td>
<td>in AD curve, with unemployment possible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetarist Mark I</td>
<td>Firms’ and workers’ price expectations given. In equilibrium labor markets and goods market clear and economy on AD curve.</td>
<td>Workers’ price expectations given, but firms’ price expectations adjust to the actual price.</td>
<td>Workers’ price expectations adjust to the actual price and the AS curve shifts. In equilibrium AS and AD curves intersect at natural rate. No unemployment.</td>
</tr>
<tr>
<td>(Price, wage, and interest rate always flexible)</td>
<td>No unemployment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rational expectations New Classical</td>
<td>Not applicable.</td>
<td>Workers’ and firms’ expectations formed “rationally.” In equilibrium economy at intersection of AS and AD. Full employment. Economy at natural rate (apart from random shocks).</td>
<td>Same as short run.</td>
</tr>
<tr>
<td>(Price, wage, and interest rate always flexible)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaleckian/post-Keynesian</td>
<td>Money wage given. Output predetermined. Price varies to clear goods market.</td>
<td>Firms adjust output if excess capacity exists) when market-clearing price deviates from marked-up price.</td>
<td>Money wage changes do not remove unemployment. Unemployment can persist.</td>
</tr>
<tr>
<td>(Wage and interest rate given)</td>
<td>in AD curve. Unemployment possible.</td>
<td>In equilibrium economy at intersection of AS and AD. Unemployment possible.</td>
<td></td>
</tr>
</tbody>
</table>
A Neoclassical-Synthesis Keynesian Model

This model — a version of the neoclassical-synthesis Keynesian model developed by Hicks [1937], Modigliani [1944] and others and used in many standard textbooks — is described by the following equations:

1. \( C = C(T) \), \( C > 0 \)
2. \( I = I(r) \), \( I < 0 \)
3. \( L = L(Y, r) \), \( L_r > 0, L_Y < 0 \)
4. \( Y = F(N) \), \( F' > 0, F'' < 0 \)
5. \( W/P = F'(N') \)
6. \( N^e = N_o \)
7. \( N = \min\{N^e, N\} \)
8. \( W = W_e \) for \( N < N_o \)
9. \( Y = C + I \)
10. \( M/P = L(Y, r) \)

where, following standard notation, \( C \) denotes real consumption, \( Y \), real output and income, \( I \), real investment, \( r \), the rate of interest (we do not distinguish between real and nominal levels for simplicity), \( L \), real money demand, \( N \), the level of labor employed, \( N_o \), labor demand, \( N^e \), labor supply, \( W \), the money wage, \( P \), the price level, and \( M \), the nominal money supply. Equations (1) through (6) are, respectively, the consumption function, investment function, money demand function, production function, inverse labor demand function (where firms are price takers), and labor supply function. In this model we assume that the labor supply is exogenously given at the level \( N_o \); it would be straightforward to introduce a positive labor supply elasticity (as below, in the monopolist and new classical models). Equation (7) makes actual labor employed equal to the short side of the market, and equations (8) through (10) close the model. Equation (8) specifies a constant money wage rate, while equations (9) and (10) give the equilibrium conditions for the goods and asset markets, respectively.

The model can be represented using the AS/AD framework. For any given level of \( Y \), equations (1) through (3) and (5) and (10) yield values of \( P \) and \( r \). If we plot the values of \( P \) for different values of \( Y \) we obtain the downward-sloping \( AD \) curve in Figure 1.

This AD curve can be given the following Marshallian interpretation. The existence of production lags implies that the level of output is predetermined at any given moment; current output is determined by past production decisions. These past decisions have been made in the light of expectations of current demand, and under pure competition, demand conditions can be represented (at the level of the individual firm) by an expected price level. With output predetermined in this way, the realised price is now determined by actual demand. Equations (1) through (8) and (9) and (10) describe this Marshallian, ultra-short-run determination of demand price for any given output. Note that the economy, on this interpretation, will always be on the AD curve; it is assumed that the price level adjusts to clear the output market in the very short run (Marshall’s ‘day’ or market period).

Turning to the AS curve, for \( N^e = N_o \) equations (5) through (7) imply that

\[ W/P = F'(N) \]

Combined with equations (4) and (8), equation (11) yields an upward-sloping relation between \( P \) and \( Y \), shown as the AS curve in Figure 1. Equation (11) holds only in short-run equilibrium, and the economy need not be on the AS curve in ‘daily’ equilibrium. Profit-maximizing firms always choose output and employment such that

\[ W/P = P' (N) \]

where \( P' \) denotes firms’ price expectations when output and employment decisions for the current period were being made (that is, their demand expectations, since we
A Monetarist Mark I Model

This model, which follows Friedman [1968] and Phelps [1970], is obtained by changing equations (6) and (8) in the neoclassical synthesis model. Thus, it is assumed that:

\[ N^e = g(W/P), \ g' > 0 \]

\[ N^e = N^p \]

where \( P \) (to be distinguished from firms’ expectations \( P^* \)) is the price level expected by labor suppliers, and equation (8) embodies the assumption of labor market clearing.

Equations (1) through (3) and (9) and (10) describing the AD curve are unchanged so the AD curve in Figure 2 is the same as before. The new AS curve is derived from equations (4) through (8). For any given value of \( P^* \), a higher price level \( P \) is associated with a higher level of output. This AS curve describes positions that are consistent with labor market equilibrium and price-taking behavior of firms. If it is assumed that firms’ price expectations are fulfilled, the economy must always be on the AS curve as well as on the AD curve. Abandoning the assumption that \( P^* = P \), deviations from the AS curve become possible as in the synthesis model of the previous subsection.

Note that the AS curve is drawn for a given value of workers’ price expectation, \( P^* \); an increase in \( P^* \) will push the curve upwards. Workers’ price expectation, \( P^* \), plays a role that is closely analogous to the money wage rate in the synthesis model. The synthesis model describes the formation of a short-run equilibrium conditional on a given money wage. The monetarist model replaces the assumption of given money wages by an assumption of given (workers’) price expectations and assumes labor market clearing. High price expectations make workers demand a high money wage rate, and high price expectations (in the monetarist model) or high wage rates (in the synthesis) therefore both lead to a reduction in employment and output.

In long-run equilibrium all expectations will be realized; that is, \( P = P^* = P^e \) and the equilibrium level of \( Y \) will be at the “natural rate.” Starting from this equilibrium at \( E_0 \) in Figure 3, an increase in \( M \) due to expansionary monetary policy will push the AD curve to the right, as shown in Figure 2. The economy will move from \( E_0 \) to \( E_1 \) in the ultra-short run if the expansion was unanticipated and firms’ demand expectations (the value of \( P^e \)) are taken to be given initially; changing expectations subsequently take the economy to \( E_2 \) as the economy attains its new short-run equilibrium level. If we replace the assumption that \( P^e \) is formed adaptively and assume Muth-rational expectations—that is, that economic agents form expectations of the future with full knowledge of the actual parameters of the model and past values of variables—the economy will always be at the intersection of AS and AD curves in daily equilibrium, and the economy will move instantly from \( E_1 \) to \( E_2 \) (abstracting from unanticipated shocks).

A Rational Expectations New Classical Model

This model, which follows Lucas [1972], Sargent and Wallace [1976] and others, differs from the previous one only in the way \( P^* \) is formed. Maintaining all of the assumptions of the previous model (and assuming perfect foresight on the part of
overcomes by a straightforward reformulation. The reformulated model, perhaps unfamiliar to mainstream economists, has post-Keynesian features and draws especially on Kalecki’s (1971) work. Some components of the previous models are preserved, making the version of this model presented here different from standard post-Keynesian treatments. The model is not usually represented using the AS/AD framework, perhaps because that framework is viewed as a neoclassical Trojan horse.

Compared with the Keynesian synthesis, represented by equations (1) through (10), we introduce changes in equations (1), (4), (5) and (10). Equation (1) is extended to allow different saving propensities out of wage and non-wage income. Assuming for simplicity that wage income is entirely consumed and a fixed fraction, s, of non-wage income is saved, we replace that equation by

\[ C = \left( W/P \right) N + (1 - s) Y - \left( W/P \right) N. \]

Equation (4) is modified by assuming constant returns to labor (below full capacity utilization). This follows from assuming that the possibility of factor substitution is limited in the short term and that excess capacity exists (assumptions which post-Keynesians claim are consistent with stylized facts); indeed, the existence of overhead labor may even give rise to a positive relation between employment and average labor productivity. Thus, we replace equation (4) by

\[ Y = P N, \quad F^* = a_2, \quad F^* = 0 \quad \text{for } Y < Y^* \]

where \( Y^* \) is full capacity output.

Assuming that firms do not hire more labor than they need for production, equation (4) implies

\[ Y = a_2 N, \]

Firms are assumed to operate under imperfect competition and to plan to set their price as a fixed markup on variable costs. If, for simplicity, labor is the only variable input, we get

\[ P = (1 + z) a_2 W. \]

where \( z \) is the markup over prime costs. If desired, this markup behavior can be derived from profit maximization with a constant-elasticity conjectured demand curve. More generally, the markup may be assumed to depend on such factors as the degree of industrial concentration, the elasticity of demand, and the bargaining power of workers [Kalecki, 1971; Sen and Dutt, 1995]. Equation (5) replaces (5).

Finally, we replace the assumption of an exogenously-given supply of money with the assumption of an endogenously-determined money supply at a given interest rate. Equation (10) is replaced by the equation

\[ P = (1 + z) a_2 W. \]
where \( r \) is determined by factors such as monetary policy.

The AS/AD representation of this model is shown in Figure 4. As in the earlier models, equations (1'), (2) through (3), (9) and (10) imply a downward-sloping AD curve, but the reasons for this shape of the curve are different. With a given interest rate, a reduction in the price level cannot produce a "Keynes effect" according to which an excess supply of money reduces the interest rate and increases investment (and the model contains no real-balance effects). However, lower prices lead to an increase in the real wage (for a given nominal wage), and this shift in income distribution entails an expansion of demand since, by equation (1'), consumption depends positively on the share of wages in income. Algebraically, the equation for the AD curve is given by

\[
P = a_i WY / (sY - Rr^3).
\]

The AS curve is simply the horizontal line defined by equation (5') when there is excess capacity; the curve becomes vertical at the full-capacity level of output. We focus on the interesting case in which the AS and AD curves intersect at a level at which there is excess capacity as well as unemployed labor.

If we take output to be given in the ultra-short-run, the AD curve shows the (hypothetical) price level that will equate the demand for goods to this given level of output. We then assume that firms compare this market-clearing price with the markup-determined price curve (given by the AS) that they plan to set: if the market-clearing price exceeds (is less than) the markup-determined price, they increase (reduce) output. This adjustment will take the economy to a short-run equilibrium at the intersection of the AD and AS curves, with the price level determined at the marked-up level shown by the AS curve, as long as excess capacity prevails.

If firms adjust output instantaneously (when excess capacity exists), the economy will always be at the intersection of the AS and AD curves, and deviations between the market-determined and markup price will never be observed. This is the case actually considered by Kalecki [1971].

Starting from a position of short-run equilibrium with excess capacity, if the money wage were to fall due to the existence of unemployed labor and all other parameters were unchanged, the AS curve would move downwards (as shown by equation (5')) but so would the AD curve (as shown by equation (13)). In fact, the two curves would fall by the same vertical distance at the equilibrium level of \( Y \), implying that the equilibrium levels of output and employment would be the same as before. This is easily verified from equations (5') and (13) which imply

\[
Y = Rr^3(1+\varepsilon)/s.
\]

Equation (14) shows that equilibrium level of output is independent of the level of the money wage. The price level simply falls proportionately with the money wage.

The inability of money wage changes to secure full employment in this model is not due to downward inflexibility of the real wage. If the fall in money wages implies a rise in the markup (since the price level does not fall equi-proportionately with the money wage) and thus a decline in the real wage, the AD curve will shift down more than the AS curve, implying a fall in output. As shown by equation (14), a rise in the markup reduces the equilibrium level of output: the redistribution of income from wage to non-wage income reduces consumption demand and leads to a contraction in output. Hence, in this model wage flexibility either has no real effect on employment (when the markup is constant) or may be counterproductive in the sense that falling money wages cause output and employment to fall if real and nominal wage rates move together. This conclusion, which is in line with Keynes' conclusions in chapter 19 of the General Theory, forms a striking contrast to the results for the neoclassical synthesis Keynesian model, in which wage flexibility leads to full employment.

**PROBLEMS WITH BARRO’S CLAIMS**

Having defined what we mean by the AS/AD framework and having provided brief descriptions of what we believe are four consistent “AS/AD models” we are in a position to examine the flaws in Barro’s arguments. We consider in turn Barro’s dis-
which output equals the demand for output) at a given price level, and assume that level of output is not necessarily equal to the actual level of output as determined by the supply side of the model. This interpretation leads them all to argue that the AD curve is inconsistent with the AS curve in standard " Keynesian" models which do not assume that the price level is given. Colander [1996] points out that the AD curve (in the standard " Keynesian" model) does not hold the level of output constant, but assumes that actual output changes without inducing any changes in the price level (as in the 4th degree of the fix-price income expenditure model or the fix-price textbook IS-LM model). He then claims that on the AS side of the model, a different story— with flexible prices and price-taking profit-maximizing producers—is introduced. Similarly, Bhaduri, Laski and Riese [1996] argue that in the AS/AD model firms are made to follow two inconsistent rules of behavior at a given price level: the AD curve makes them produce according to the level of aggregate demand, while the AS curve makes them produce to maximizing profit.

While Barro recommends the rejection of the AS/AD framework, the other three papers suggest ways out of the alleged inconsistency. Fields and Hart [1990] argue that when the price level is changed, one needs to examine the effects of this price change on output supply to find the new level of aggregate demand. But in examining the effect on output they use the Lucas surprise-supply function (according to which output deviates from its natural rate only—abstracting from persistence effects due to slow output adjustment—if there are expectational errors). The resultant model, of course, is not the neoclassical-synthetic Keynesian model with unemployment due to wage rigidity, but one which makes the economy always produce along the Lucas supply curve! Bhaduri, Laski and Riese [1996] suggest that one of two possible routes be followed. In one, they derive an AD curve in which they take aggregate demand at each price to be actually determined by output supply, and use the profit-maximization condition (with a given money wage) to find output supply. Thus the AD curve does not imply market clearing in the goods market, but gives the level of aggregate demand at each price level and the corresponding level of output at that price level which follows from profit maximization by firms. They combine this with the standard AS curve of the synthesis model. In the other, they depart from profit maximization altogether, assuming that firms satisfy by using a markup to set price, and adjust their output according to the demand for goods. While there is no logical problem with the second route, and it is similar to that taken in our Kaleiakian post-Keynesian model, the first route is unclear about its microeconomic foundations and firm behavior; the same is true of the other hybrid models presented by Bhaduri et al. Colander [1996] proposes the use of an AD curve that does not incorporate multiplier effects and takes into account only the direct effects of the price level on aggregate demand; his suggestion is thus similar to Bhaduri et al.'s first route. To introduce "complicated" dynamics into the model, Colander also introduces a coordination technology which uses capital and labor as an additional argument into his production function for output. He argues that this modification of the standard model can give rise to a fall in output due to self-fulfilling coordination shocks without changes in the real wage. Short of noting that this construction is—to say the
output and (2) the model implies the existence of automatic tendencies for actual output to converge to the "natural rate" level.

Third, Barro endorses the rational-expectations new-classical model as consistent, but argues that it is not Keynesian. We agree with him regarding these claims. However, we would point out that the model is not Keynesian for the same reason as the Monetarist Mark I model. The only difference between the rational-expectations new-classical model and the Monetarist Mark I model relates to the way expectations are formed. It is therefore unclear to us why Barro should think that the former model is consistent but the latter is not. While we agree with Barro's endorsement of the new classical model on grounds of internal consistency, we are not convinced of its empirical relevance, given the overwhelming evidence regarding the nature and duration of unemployment. This is not the place, however, to enter a discussion of this issue.

Fourth, regarding the neoclassical-synthetic Keynesian model, Barro does not argue it to be inconsistent, but claims that it is not Keynesian, and that it is inconsistent with empirical evidence. On the issue of Keynesian pedigrees, Barro argues (unlike Keynes) that unemployment is due to an excessively high real and nominal wage, and that firms are never constrained by aggregate demand because the goods market clears due to price changes. While it is certainly true that unemployment in this model is associated with a high real and money wage, it is not true that firms are unconstrained by aggregate demand in Keynes' sense. As Barro correctly notes, a rise in aggregate demand (following, say, an exogenous increase in investment due to higher long-period expectations) will push the AD curve to the right and increase employment.

Barro seems to think that output cannot be constrained by aggregate demand if the goods market clears due to price variations. In the neoclassical-synthetic Keynesian model firms always assume that they can sell any amount they want at the price they expect. Their price expectations may not be accurate but they actually end up selling the amount they produce at a price which is exogenously given to each firm: the price level adjusts to clear the market during the 'day' and under assumptions of pure competition no firm is in a position to affect this market price. But output is still constrained by aggregate demand in the sense that if aggregate demand had been higher, the resultant rise in market price would have induced all firms to produce more goods and services and employ more labor. A reading of The General Theory should make it clear that Keynes was thinking of aggregate demand constraints in this sense rather than in terms of an excess supply of goods and the appearance of quantity rationing at the level of the individual firm.13,14

Although the clearing of the output market is fully consistent with Keynes' General Theory model, there is another, very important, inconsistency. The synthesis model implies that money wage flexibility would cure the problem of unemployment. This implication of the model is inconsistent with Keynes' own analysis (Keynes, 1936, Ch. 19). Thus we agree with Barro that the model is not truly Keynesian, but we dispute his reasoning in support of this conclusion. One of the revolutionary aspects of Keynes' analysis was his 'wage theorem' (in Hicks' 1974 terminology). According
to this theorem, variations in money wages will have no net effects on real output and employment in a closed economy. Falling money wages will influence the economy in a number of different ways, but an balance are unlikely to stimulate output; if anything, declining money wages will, in Keynes' view, have adverse effects on employment and output by reducing the level of aggregate demand. Thus, he concludes his examination of changes in money wages by noting that

if labor were to respond to conditions of gradually diminishing em-
ployment by offering its services at a gradually diminishing money-
Wage, this would not as a rule, have the effect of reducing real wages
[and thus increase output and employment, AKD & FSJ] and might
have the effects of increasing them, through its adverse influ-
ence on the volume of output. The chief result of this policy would be
to cause a great instability of prices, so violent perhaps as to make
business calculations futile in an economic society functioning after
the manner of that in which we live. To suppose that a flexible-wage
policy is a right and proper adjunct of a system which on the whole is
use of laissez-faire, is the opposite of the truth. [Keynes, 1936, 268]

The post-Keynesian model presented above echoes this conclusion, but the result is
not restricted to monetary regimes in which the interest rate is kept constant through
monetary policy as in the Kaleckian/post-Keynesian model above. In models with a
variable interest rate, the Keynes effect of reduced interest rates and (empirically insignif-
icient) real balance effects on consumption may be more than offset by the
adverse influences of debt deflation, distributional shifts, and expectations of
continuing reductions of wages and prices.

On the empirical side Barro points out that the synthesis model predicts a pat-
tern of countercyclical real wages and labor productivity, a prediction which fits badly
with observed patterns of procyclical real wages and procyclical productivity. This
empirical problem was noted by Dunlop [1938] and Tsursh [1939] soon after the
appearance of The General Theory. It occurs in the neoclassical-synthesis model due
to the assumptions of diminishing returns to labor and pure competition. However,
the Kaleckian/post-Keynesian model of the previous section, which jettisons both di-
minishing returns and pure competition, does not imply that a rightward shift in the
AD curve reduces the real wage. In this model, the change, the real wage,
given from equation (1) to be $(1.2, 1.0, 1.2)$, will not change if $a$ and $e$ are fixed.
Furthermore, if one adds to the model the assumption that $e$ declines when $Y$ rises due
to a tightening in the labor market which increases the bargaining position of work-
ers [Kalecki, 1971], or because of the pricing policies of firms [Stiglitz, 1984, Rotemberg
and Saloner, 1980], then this particular AS/AD model does produce procyclical varia-
tions in the real wage. With respect to the pattern of productivity, the simple Kaleckian/
post-Keynesian AS/AD model assumes a constant labor productivity; allowing for
overhead labor, efficiency wage effects or labor hoarding, a procyclical pattern would
emerge in this model. Thus, simple modifications of the Keynesian model—modifica-
tions which preserve Keynes' insights into the determination of output by effective
demand—make the model consistent with the empirical evidence cited by Barro.

**CONCLUSION**

This paper has argued that Barro's call for rejecting the AS/AD framework as a
coaching tool is unwarranted, and that the criticisms by others regarding the frame
work are also misplaced. The AS/AD framework can be useful for the presentation
and comparison of a variety of different macroeconomic models. We have briefly
discussed four such models and argued against Barro's tirade against the AS/AD
framework.

Barro's attacks on the AS/AD framework appear to be motivated by a hostility
towards models in which the economy can suffer persistent unemployment due to
demand constraints. He has not, however, produced convincing reasons to show that
such models should be abandoned. We have argued this in particular using a Kaleckian/
post-Keynesian model.

Although we have argued in favor of the AS/AD framework, we should end with
two cautionary remarks. First, the name AS/AD framework misleadingly conjures
up images of demand and supply curves with which the reduced-form AS and AD
curves have no relation. Perhaps a new name is in order such as GALS/AGP (goods-
assets/labor-pricing). Second, the AS/AD framework presents models which are quite
complex. If they appear to confuse an economist of the caliber of Barro, they may
certainly confuse students in introductory economics courses. We thus agree with
Geithman's [1994] recommendation that the AS/AD framework not be used in such
courses before students learn about the functioning of goods, assets, and labor mar-
kets. However, once students reach the stage of intermediate courses and develop
an understanding of how these markets function, the AS/AD framework can be used to
analyze and compare different macroeconomic models and thereby help students de-
velop their own ability to think about the complexity of macroeconomics.

**NOTES**

We are grateful to Amit Bhardwaj, David Colander, Thomas D'Allesio, James Bos and the editor of this journal for their comments on an earlier draft of this paper, and to the other two for making their unpublished work available to us. This paper was written while Peter Skott was Visiting Professor in the Department of Economics at the University of Notre Dame.

1. See the references in those papers for names of additional critics.

2. In his response to Barro's paper, Geithman, while admitting that "Barro's judgment is overdrawn
and his recommendation excessive," argues that he is "too hesitant toward the AS/AD apparatus" [1984, 476]. Geithman takes the view that the framework "offers textual succinctness and expediency convenience at the cost of impeding the development of student analytical abilities." He also seems to endorse Barro's claim that "the typical AS/AD textbook treatments are ... logically flawed" [ibid., 477].

3. We should note explicitly that we do not consider any of the ideas discussed in this paper as original.
Had the papers by Barro and the other authors mentioned not appeared, we would have thought that
these ideas were widely known, and not considered it necessary to put them to paper. The ideas have
been put forward by a number of authors in a variety of contexts, too numerous to exhaustively recount. The fact that we, at various points in this paper, refer to our own earlier work, should not be interpreted to mean that we consider ourselves to be their originators.

4. A fixed level of W is not required for this analysis. A positive relation between W and $\bar{W}$ would produce a similar model. We assume that W is fixed for expository simplicity. Keynes [1936, Ch. 21] discusses the reasons for the empirically-observed wage stickiness. See also Hicks [1937, Ch. 3], Wood [1978], Blinder [1980] and Shott [1986].

5. This structure follows Keynes [1936]. The Marshallian interpretation of Keynes is discussed in greater detail in Chick [1936], Shott [1936] [1939] and Dutt [1984].

6. We assume that the rate of change of expected price is determined by the difference between the actual price and the expected price, and that the speed of adjustment in expected price is not large enough to destabilize the economy.

7. This analysis assumes that the position of the short-run equilibrium remains unchanged. Shifts in the short-run equilibrium (due to induced changes in some of the parameters) imply that the sequence of ultra-short-run equilibria will be chasing a moving target, the economy may never reach a position of short-run equilibrium. Shott [1986] 1990, 1995 discusses this issue in greater detail.

8. Hicks [1938] contains a dynamic analysis along these lines.

9. The same Mark I is due to Hahn [1968] and Tabb [1980] and is meant to distinguish this approach from Monstrum Mark II, which is called the Rational Expectations New Classical approach below.

10. A good exposition of some of the ideas contained in this model will be found in Lavoie [1989], who also discusses the empirical relevance of several of the assumptions used here.

11. Moore [1968] calls this the horizontalist position as opposed to the verticalist position; see also Lavoie [1989, Ch. 4]. Although some post-Keynesian authors argue that this approach is generally applicable, more skeptical readers may take this assumption to imply that the central bank follows the policy rule of pegging the interest rate.

12. If the AD and AS curves intersect at the vertical portion of the AS curve, output will be at the full-employment level and the price will be determined at the market-clearing level shown by the AD curve. The adjustment of output by the firms due to the fact that the market-clearing price is higher than the current price is no longer possible, since the economy is in equilibrium.

13. See Shott and Dutt [1996] for a fuller discussion of this point. Cleaver [1994] says with this interpretation but then concludes that Keynes’s analysis did not actually contain a formal treatment of aggregate demand failures. In this he seems to be accepting Berry’s definition of aggregate demand constraints.

14. Berry also states that this model can be a test case like the Keynesian consumption function, the investment accelerator (or Keynesian investment function), do not apply. Since the model does include the consumption and investment function, it is not clear what Berry means. The accelerator was not maintained by Keynes himself, but the clearing of the output market certainly does not exclude a strong accelerator-type influence of the degree of capital utilization (and hence of changes in aggregate demand) on investment.

15. Keynes’s own aggregate demand and aggregate supply curves in F and N space, face the same problem.

REFERENCES


