Teaching Keynes’s Principle of Effective Demand Using the Aggregate Labor Market Diagram

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Abstract: This paper suggests a way to teach Keynes’s principle of effective demand using a standard aggregate labor market diagram that should be familiar to students taking an advanced undergraduate course in macroeconomics. The analysis incorporates Kalecki’s version of the effective demand model to show Keynesian unemployment as a point on the aggregate labor demand curve inside the aggregate labor supply curve. The well-known Keynesian policy conclusions apply. In particular, workers and firms are unable to restore full employment by reducing real wages, underlining how important is the macroeconomic duty of the monetary and fiscal authorities to manage aggregate demand growth.

Keywords: Unemployment, Keynes, Kalecki.

JEL Classifications: E12, E24.

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When Keynes wrote The general theory of employment, interest and money during the Great Depression of the 1930s, his aim was to explain situations of high unemployment that were not self-correcting through workers accepting lower real wages. ‘There may exist,’ he argued, ‘no expedient by which labor as a whole can reduce its real wage to a given figure by making revised money bargains with the entrepreneurs … [since] primarily it is certain other forces which determine the general level of real wages’ (Keynes, 1936, p. 13). Keynes’s theory, termed the principle of effective demand, is difficult to teach to undergraduates because it appears to be so contrary to what economics students learn in their first year: that a competitive market eliminates excess supply by inducing a fall in its market price. Yet understanding how inadequate effective demand may interfere with this mechanism in the labor market is essential if students are to appreciate why modern macroeconomic policies place so much emphasis on maintaining aggregate demand growth, especially in times of national or international economic distress. The purpose of aggregate demand management is not just to minimize short-term economic fluctuations due to nominal rigidities (although this is also an important objective), but also to prevent the emergence of persistent unemployment that might be unaffected by individual or collective wage adjustments.

This paper therefore suggests a way to teach Keynes’s principle of effective demand using a standard aggregate labor market diagram that should be familiar to students taking an advanced undergraduate course in macroeconomics. The diagram includes McDonald and Solow’s (1981) idea of relating the labor demand curve to iso-profit curves. This permits
the use of a version of the principle of effective demand due to Kalecki (1939), based on the distribution of income between wages and profits, to show Keynesian unemployment as a point on the aggregate labor demand curve inside the aggregate labor supply curve. From this point, a reduction in the real wage rate reduces the cost to firms of employment (inducing an increase in the notional demand for labor), but also reduces the spending power of workers (inducing a fall in the effective demand for consumption goods). This second effect means that unemployment cannot be cured by a lower real wage without a simultaneous increase in exogenous expenditure to relax the effective demand constraint.

THE AGGREGATE LABOR MARKET

Assume that the economy is made up of a large number of competitive firms. Suppose also that the technology used by firms means their individual decisions can be analyzed as if a social planner maximizes profits using an aggregate production function for the whole economy. That is, let real output, \( Y \), depend on the quantity of labor employed, \( L \), according to the aggregate production function \( f(L) \), which is assumed to be continuous and twice differentiable with \( f'(L) > 0 \) and \( f''(L) < 0 \). Denote the cost of labor by \( w \), and the market price of output by \( p \). Let \( p \) be profits expressed in real terms. The constrained optimization problem is then to choose the value for \( L \) that maximizes:

\[
p = f(L) - \left(\frac{w}{p}\right)L
\]

Differentiating (1) with respect to \( L \) and setting the result equal to zero produces the standard result that the marginal product of labor must equal the real wage:

\[
f'(L) = \frac{w}{p}
\]

Equation (2) is the aggregate labor demand curve. The assumption that marginal product falls as employment rises means the curve is downward-sloping, as depicted in Figure 1. The figure also shows four representative iso-profit curves (see McDonald and Solow, 1981). Each iso-profit curve represents equation (1) for some specific value of \( p \), with higher levels of profits associated with curves further down and to the right of the diagram. It is easily shown that each curve is strictly concave as a result of the assumption of diminishing returns to labor (\( f' > 0 \) and \( f'' < 0 \)). By construction the labor demand curve passes through each curve at its maximum point, since it shows for every real wage rate the level of employment that maximizes profits in equation (1) at the point where the real wage constraint (a horizontal line for any given \( w/p \)) is tangential to the highest attainable iso-profit curve.

– FIGURE 1 PLACED ABOUT HERE –

For the sake of simplicity, the aggregate labor supply curve, \( LS \), in Figure 1 is assumed inelastic at a labor force denoted \( L^* \) (the analysis is easily extendable to the case of an upward-sloping supply curve). The intersection of \( LS \) and \( LD \) represents the competitive market equilibrium at point \( C \). This sets the market-clearing real wage rate, \( (w/p)_C \), and the associated level of real aggregate profits, \( p_C \), as shown in the figure. The next section demonstrates how the principle of effective demand may prevent competitive forces from producing this classical outcome.

THE PRINCIPLE OF EFFECTIVE DEMAND

Assume a closed economy with no government (again for the sake of simplicity) so that the components of aggregate demand, \( AD \), are consumption expenditure, \( C \), and investment expenditure, \( I \), all measured in nominal terms.

\[
AD = C + I
\]

The essential element of Keynes’s principle of effective demand is his dual taxonomy of demand into induced expenditure and autonomous expenditure (Davidson, 1998, p. 822). This is typically achieved in textbook models by assuming that consumption expenditure
depends on income (induced expenditure), while investment is assumed to depend on non-income factors alone such as business confidence (autonomous expenditure). An alternative approach due to Kalecki (1939) is to assume that all wage income received by workers is spent on consumption goods (so that the propensity to consume out of wages is unity), but all other expenditure is exogenous in real terms. Kalecki’s approach is the model adopted here. Denote the real value of autonomous expenditure (including any consumption expenditure by profit-receivers and all investment expenditure) as A, so that pA is its nominal value. Aggregate demand in nominal terms is then given by equation (4):

$$AD = wL + pA$$  \(4\)

In equilibrium, aggregate demand equals aggregate supply, pf(L). Substituting this term into the left-hand-side of equation (4) produces the following equilibrium condition:

$$f(L) - \frac{(w/p)L}{p} = A$$  \(5\)

Compare the left-hand-side of equation (5) to the right-hand-side of equation (1). These two equations imply that the level of autonomous expenditure, A, fixes the economy’s aggregate level of profits, p:

$$p = A$$  \(6\)

Equation (6) is a standard result in models of this type, producing the famous dictum that ‘capitalists earn what they spend, and workers spend what they earn’. For the purposes of the present analysis, it means that only one of the iso-profit curves in Figure 1 is compatible with effective demand in equilibrium, the curve defined by p = A. This is illustrated in Figure 2, with the equilibrium curve in bold and chosen so that it intersects the demand curve at a point, K, to the left of point C in Figure 1. Thus point K represents a position of Keynesian unemployment, compared to the classical full employment outcome at point C.

Several important points can be pointed out to students about point K. First, it lies on the aggregate labor demand curve, but inside the aggregate labor supply curve as argued by Keynes (1936) in Chapter 2 of The general theory. Second, wage cuts in the model are powerless to reduce the resulting involuntary unemployment. Suppose real wages are reduced from \((w/p)K\) to \((w/p)C\), either by a fall in the nominal wage rate or by a rise in the general price level. Hiring additional workers would be profitable for employers, but the extra output produced could not be sold. This is because a lower real wage rate also reduces the spending power of workers, who are therefore forced to reduce their consumption expenditure. This shifts the economy down the equilibrium iso-profit curve to point B. The reduction in aggregate demand leads to excess inventories being built up by firms until lower output prices restore \((w/p)K\). This is Keynes’s fundamental objection to classical theory expressed in the introduction of this paper: ‘There may exist no expedient by which labour as a whole can reduce its real wage ... it is certain other forces which determine the general level of real wages’ (Keynes, 1936, p. 13).

Third, the analysis leads to the core Keynesian policy conclusion that this form of unemployment can be addressed only by an increase in autonomous expenditure, perhaps through increased public investment by the government, or perhaps through increased private sector expenditure as a result of policy-induced reductions in the rate of interest.

Fourth, the model confirms the classical observation that such full employment policies will fail if inside workers combine to protect the real wage rate, \((w/p)K\) (Lindbeck and Snower,
This is another illustration of why Keynes called his work The general theory; it contains other theories as special cases. In this example, if policymakers engineer an increase in autonomous expenditure to relax the effective demand constraint at K, there will be no increase in employment if real wages are not permitted to fall for the standard neoclassical reasons. This may be one contributing factor to why successful Keynesian policies in the 1960s led only to stagflation in the 1970s, if there was a high degree of real wage resistance after the 1973 oil shock (Dalziel, 1993).

Finally, the diagram suggests another possibility for a corporatist economy. Given the effective demand constraint, $p = A$, a movement from point K to point D would leave profits unchanged, would reduce the real wage and would eliminate involuntary unemployment. Point D is unstable, however, since at the lower real wage firms could attempt to increase profits by reducing employment, although the aggregate demand constraint would then bring the economy back to point K. Thus, point D would have to be the outcome of collective bargaining in an enforceable social compact (Chick, 1983, pp. 163-167). Note also that a relaxation of the aggregate demand constraint under these circumstances would lead to lower real wages (the move from point D to point C), further complicating the political economy of such a corporatist approach.

CONCLUSION

The labor market exposition of Keynes’s principle of effective demand presented here has several attractive features. It makes explicit the dual role of wages as a cost of production for firms and as a source of spending power for workers. It is therefore able to show students how persistent unemployment may emerge as a labor market outcome created by inadequate effective demand in the aggregate goods market. It can then be used to illustrate the orthodox Keynesian policy solutions. The model also incorporates income distribution considerations into the analysis, revealing trade-offs in any demand management or corporatist response to persistent unemployment caused by inadequate effective demand. Most importantly, the model presented in this paper makes clear to students the solid theoretical foundation underlying the established practice of using fiscal and monetary policy to manage aggregate demand growth in order to maintain employment (rather than relying solely on labor market competition), especially in periods of domestic or international economic distress. These features are all important insights for students of Keynes’s thought and his policy proposals to avoid persistent high unemployment.

NOTE

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FIGURE 1 
The Aggregate Labor Market Model 
w/p 

\[ pC \]
\[ LD \]
\[ L^* \quad L \]

FIGURE 2 
Keynesian Involuntary Unemployment 
w/p 

\[ p = A \]
\[ LD \]
\[ L^* \quad L \]

Addressing the aggregation problem by assuming it away like this is not as unreal 
as it may appear. Because decisions are made at the margin, it is possible to think of the 
economy’s marginal firm making a marginal decision about its marginal worker, so that 
the microeconomic and macroeconomic decision-making processes coincide. 

See also Kalecki (1969, p. 46; 1971, p. 156). A good analysis of Kalecki’s theory 
and its relation to The general theory of Keynes is provided by Chapple (1991, 1995). Kalecki’s 
model was also important in the work of Robinson (1956) and Harcourt (1965), and in 
recent research by Lavoie (1996/97 and 2001). 

Kaldor (1955/56, p. 96) and Sawyer (1985, p. 73). Professor G. C. Harcourt 
suggests to 
us that the aphorism would be better phrased as ‘wage-earners spend what they earn
while profit-receivers receive what they spend'.