

## CHAPTER FIVE

### *From Craft to Mass Production*

*The remarkable generalization [holds, in a modern economy] that, in all ordinary circumstances, the volume of employment depends on the volume of investment, and that anything which increases or decreases the latter will increase or decrease the former.*

— John Maynard Keynes

Henry George did foresee the emergence of giant industry, in connection with monopoly, but he never considered whether widespread giant industry implied an economy that no longer worked through the price mechanism. Keynes initially accepted the idea that the price mechanism did adjust to ensure that the real wage equaled the marginal productivity of labor. He did not, however, explain how this equality was brought about in labor markets in which behavior responds to money wages. In his view, the equality of the real wage and the marginal product justified calling the position an equilibrium, but as reconstructed here, the argument shows that there will be a large number (on plausible assumptions, an infinite number) of such positions, besides the full employment level. The way this works was shown in a diagram in the previous chapter (Figure 4.1, p. 88), in which it is clear that price changes tend to move the system to a profit-maximizing position for any given level of investment.

This certainly appears to be a *stabilizing* pattern of adjustment. Each position of the economy is combination of a level of investment and a level of consumption (equal to the level of the real wage bill), such that higher investment (driving up prices, lowering real wages) would appear to be associated with lower consumption spending. This is stabilizing. When investment falls, for example, prices will fall, and consequently real wages, and therefore consumption spending, will rise, offsetting the decline in investment.

Such a pattern of adjustment puts the burden on profits; prices would fall in a slump, and firms would have to draw down their reserves. Accordingly, firms should seek to develop greater flexibility, which would allow them to adjust the level of employment to market conditions, laying off and rehiring workers as demand changes. This provides an important incentive to innovate (Nell 1998a). Keynes did not examine this. However, he recognized that price adjustments did *not* work to stabilize the system. On the contrary, fluctuations in investment appeared to set off destabilizing movements.

Keynes set out to explain this in his lectures leading up to the publication of the *General Theory* in 1936; he argued that investment and consumption *moved together, not inversely*, thereby increasing volatility. Although he did not demonstrate it clearly, this movement is a consequence of reducing the rate of diminishing returns, "flattening" the production function. What he did argue clearly was that investment was the active variable, the causative force, while consumption (and saving) simply reacted passively. But in addition, as we can now see, prices and

employment could adjust in such a way that the real wage and the marginal product of labor were brought into equality, thereby maximizing profits, *while at the same time investment and consumption moved together, rather than inversely*, thereby creating “multiplier”-based volatility in the system. There is no pressure here to move to full employment, but each position can reasonably be considered an “equilibrium.” This is what we have to show.

### **Changes in the “Production Function”: The Multiplier Replaces the Price Mechanism**

When the curvature of the production function is considerable, the elasticity of the marginal product curve will be greater than  $-1$ , so a fall in investment,  $I$  will lead to a rise in the wage bill,  $W$ , and therefore in consumption spending,  $C$ , as shown in Figure 5.1. But when the production function is rather flat, the elasticity of the marginal product curve will be less than  $-1$ , so that a fall in investment will lead to a decrease in the wage bill and consumption spending, as indicated. In this case, not only is there no offset to the drop in investment, the effects are made worse. And that is the conclusion Keynes reached and tried to explain in the lectures he gave in Cambridge.

The variability of profits in the craft economy provides an incentive to change the technology so as to control current costs; the innovations must change current costs from fixed to variable, which can be done by taking on additional capital costs. This will be particularly advantageous when there are pressures for

the real wage to increase: at the higher wage, it will be worthwhile to mechanize, so at current prices capital per worker rises, and the scale effects allow for greater flexibility in adjusting employment,  $N$ , to changes in the level of demand.

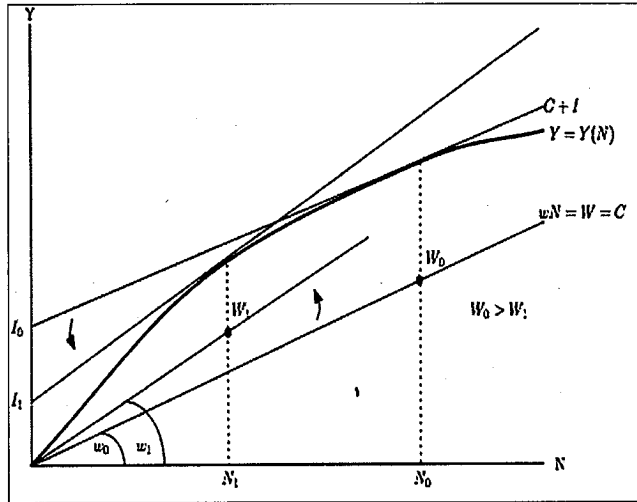


Figure 5.1. Consumption Moves with Investment

Fluctuations in  $I$  will normally have some impact on  $N$  even in a craft economy. But there will be an offsetting movement in  $C$  so long as the curvature of the employment function is large. The price mechanism is stabilizing for the system as a whole, but the effect is that profits fluctuate sharply for individual businesses. Firms will be motivated to redesign their production systems to allow greater flexibility in adapting to demand fluctuations.

This means being able to add on or lay off workers without greatly disturbing unit costs. As such redesigning takes place, it will reduce the curvature of the employment function; that is, diminishing returns will be lessened. We can think of this as a progressive “flattening” of the employment function. When this reaches the point where the marginal product curve has unitary elasticity, such that the proportional change in the real wage is just matched by that in employment, then the total wage bill is unaffected by the price changes following the change in  $I$ . If the total wage bill is unaffected, then, based on the assumptions made earlier, total  $C$  will be unchanged.

This will be the case, for example, when the employment function takes the form  $Y = A(\ln N)$ . Hence,  $I$  may fall, for example, but  $C$  will not change. There will be no offset. So  $dY/dI = 1$ . Any *further* reduction in the rate at which returns diminish will mean that the *change in employment will outweigh the change in the wage bill*, so that  $C$  will move in the same direction as  $I$ . In this event,  $dY/dI > 1$  will always hold (Nell 1998a, 1992a, 1992b).

We need to define the point of full employment—the point at which the entire labor force has jobs. An appropriate concept of full employment would be “no vacancies,” or rather, “no vacancies except turnover vacancies.” Employment is full when all farms, factories, offices, and shops have hired the employees they need to operate at their optimal level. Output at the point of full employment will be associated with a marginal product; that marginal product will become a real wage; the real wage, multiplied by the level of full employment, defines the wage bill,

which is equal, according to the assumptions, to consumption. The difference between full employment output and consumption must be filled by investment.

Now let investment fall below this full employment level. As it does, it will trace the marginal product curve. At each lower level of investment, prices will fall and the real wage rise, while employment will fall; the overall effect on consumption will depend on the elasticity of the marginal product curve. Each point on the curve will be an *equilibrium*, in the sense that money wages and prices have adjusted to produce the profit-maximizing position (see Figure 5.2).

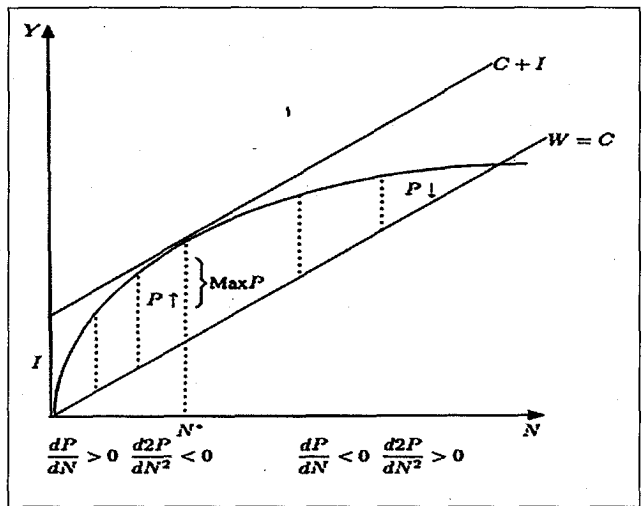


Figure 5.2. Behavior of Profits

That this pattern of price flexibility dampens fluctuations by partially offsetting them, in conditions of strongly diminishing returns, can be shown very simply. Recalling our equations:  $Y$  is real output,  $N$  employment,  $w/\pi$  the real wage, and  $I$  investment. All wages are consumed. As above,

$$Y = Y(N), Y' > 0, Y'' < 0$$

$$Y = C + I$$

$$w/\pi = Y'(N)$$

$$C = (w/\pi)N$$

Clearly

$$Y = I + (w/\pi)N, \text{ so}$$

$$dY/dI = \delta I/\delta I + N[\delta(w/\pi)/\delta I] + (w/\pi)[\delta N/\delta I] = 1 + N[\delta(w/\pi)/\delta I] + (w/\pi)[\delta N/\delta I]$$

where

$$N[\delta(w/\pi)/\delta I] < 0 \text{ and } (w/\pi)[\delta N/\delta I] > 0$$

So  $dY/dI >$  or  $< 1$  according to whether

$$N[\delta(w/\pi)/\delta I] > \text{ or } < (w/\pi)[\delta N/\delta I]$$

As long as returns diminish sufficiently,  $dY/dI < 1$ ; price changes due to variations in investment demand will lead to a partial offset.

In short, so long as diminishing returns are significant, the price mechanism will lead consumption to adjust so that it will

tend to make up for a shortfall, or offset an excess, of investment. It thus tends to stabilize demand around the normal level of output and employment.

### **Adjustment to Demand Fluctuations in the Mass Production Economy**

Modern economies appear to be subject to strong fluctuations in demand. Indeed, examples of market instability can be found everywhere, although the instability is usually bounded in some way. There do not appear to be, in the modern world, strong and reliable market-based forces ensuring stability. Investment spending appears to be a major source of demand variation. Yet, if the purpose of investment were simply a corrective, moving the actual capital/labor ratio to its optimal level, stabilization would hardly be needed. Such a long-run position would be stationary, or, if the labor force were growing, the economy would expand uniformly. This is the picture presented by neoclassical theory, articulated, for example, by Hayek (1941).

Keynes and the older classical economists, especially Ricardo and Marx (1967), offer a different view: investment is the accumulation of capital, a process by which productive power is created, organized, and managed. It is driven by the desire for power and wealth, and there is no definable "optimum." Investment expands productive power but does not move the economy toward any definite destination. Given such motivation and the important role of technological innovation, the urge to invest will sometimes be strong and widespread, at other times weak



and uncertain. This may help to explain the need for stabilizing policies arising from the demand side.

In postwar mass production economies, prices do not play an important role in adjustment to changing demand (Nell 1998a). In Hicks's (1965) terms, this is a "fixed-price" economy. Employment is much more flexible, and constant returns appear to prevail in the short run; to put it differently, unit costs are broadly constant as employment and output vary over a wide but normal range. Prices can therefore be maintained at their long-term levels, while permitting only small temporary variations around that level. Workers need only be semiskilled and teams can easily be broken up and re-formed; processes can be operated at varying levels of intensity in response to variations in demand, and they can easily be shut down and started up again. It is likewise easy to lay off and recall workers.

So, in Figure 5.3, we have an aggregate utilization function, but here the mass production economy will be characterized by a straight line rising from the origin, showing constant marginal returns in output to additional employment; that is, to more intensive utilization. As a first approximation, consumption can be identified with wages and salaries, while investment can be taken as exogenous. As employment rises, the wage bill—and so consumption spending—will grow at a constant rate, namely, the normal wage rate. The wage bill—assumed equal to consumption spending—is represented by a straight line rising to the right from the origin; its angle is the wage rate. Investment spending will be treated as exogenous in the short run, so it will be marked off on the vertical axis. Aggregate demand will then

be the line  $C + I$ , rising to the right from the  $I$  point on the vertical axis; its slope is the wage rate.

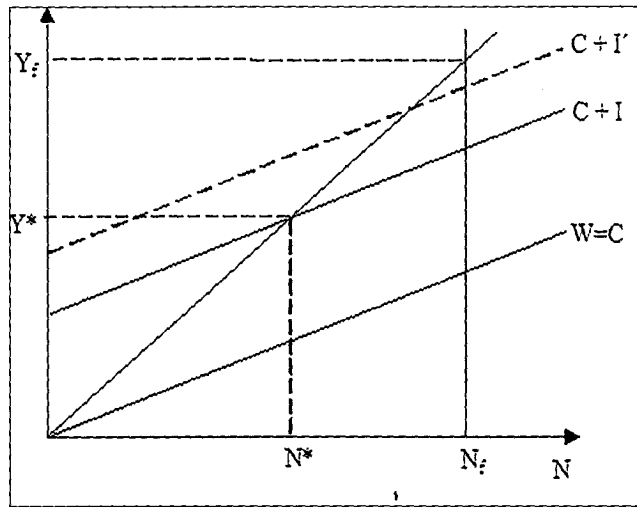


Figure 5.3. Adjustment in the Mass Production Economy

The origin is the point at which labor costs absorb all output. Employment in such an economy will depend only on effective demand; there is no marginal productivity adjustment. Output will increase with the amount of labor employed (i.e., capacity utilized), with a constant average productivity of labor; all, and only, wages will be spent on consumption, and all profits will be saved as retained earnings. Investment can be taken as exogenous as a first approximation. Expenditure is given by the  $C + I$  line. (This ignores  $G$ , government spending, for the moment, although in the modern world it will be much greater than in

the earlier forms of the capitalist economy.) But the output function will be a straight line rising from the origin with a slope equal to the average productivity of labor—a. Suppose investment is exceptionally high; then employment will be increased, and consumption will also be exceptionally high. Conversely, if investment is low, employment will be low, and thus so will consumption. Consumption adjusts in the same direction that investment moves. When investment rises, consumption, output, and employment also increase in a definite proportion.

And rents? So far, in discussing macroeconomics we have largely left them to one side and that is what academic economics (apart from the work of James Meade [1966]) has tended to do.<sup>21</sup>

In spite of ignoring rents, our analysis does provide us with a number of powerful insights, mostly from a post-Keynesian perspective. Admittedly, they are derived on the basis of very great abstraction, so they cannot be expected to prove literally true; but they may nevertheless give us genuine insight into what will happen to the level of employment and output. For example:

- Investment and profits are equal here; this suggests that we should expect to find them closely correlated in practice—as we do (see Nell 1998a, chap. 7; Asimakopulos 1992).

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<sup>21</sup> “Rent” does not appear in the index of Hicks, *Value and Capital*; nor in his *Capital and Growth*; nor is it found in Ferguson, *The Neoclassical Theory of Production and Distribution*; nor in Morishima, *Theory of Economic Growth*. These are serious books, and they seriously overlook land, rents, and real estate.

- Investment determines profits here; investment is the driving force. We should expect to find something like this in reality—as many studies, e. g. Asimakopulos, do.
  - The multiplier here will equal  $1/(1 - w/a)$ , where  $w$  is the real wage and  $a$  is the average productivity of labor. That is, the multiplier will reflect the distribution of income, and will not be very large. Again, this seems plausible.
  - Real wages and the level of employment and output are *positively* related. This can be seen by drawing in a steeper wage line, with the same level of investment. The  $C + I$  line will then also be steeper, and will intersect the output line at a higher level of output and employment. In fact, most empirical studies of the postwar era (e.g., Nell 1998b; Blanchard and Fisher 1989) do find real wages and employment to be positively related.
  - Household savings *reduce* output, employment, and realized profits. (Obviously, qualifications are needed, and it must be remembered that this is a short-run analysis—but the long run may never come. If this proposition seems hard to accept, think about Japan in the 1990s—and even more recently.)
  - Unemployment is the difference between the level of full employment (marked off on the horizontal axis of the diagram) and the actual (current) level of employment. It clearly results from deficiency in demand. That is, either investment is too low or wages are too low, which implies that increasing either will reduce unemployment.
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This is macroeconomics, the post-Keynesian variety; however, many of these propositions, or similar ones, can be found in other versions. None of this would have been familiar to Henry George, who lived in an economy that operated according to a price mechanism, as we have seen. Today's world is different. But the idea that rounds and rounds of re-spending spread through the economy like ripples on a pond would not have been unfamiliar. George would have had no trouble figuring it out.

Finally, let's look at money. Let household saving increase with the rate of interest (as consumer durable spending declines), while business investment declines as the rate of interest rises (see Figure 5.4). (Neither influence is likely to be very great.<sup>22</sup>) More precisely, when interest is relatively high, businesses are likely to curtail or postpone investment projects, and households may cut back on consumer durables. Thus, when interest is high, the investment line must shift down to a lower intercept, while the household consumption line will swing down, reducing its angle. When interest rates are relatively low, investment and household spending will be correspondingly higher. Thus, we can construct a downward-sloping function relating the rate of interest,  $i$ , to employment,  $N$  (see Figure 5.5). This function (in Figure 5.5) will intersect a horizontal line representing the level of the rate of interest as pegged by the central bank; this will determine the level of employment.

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<sup>22</sup> These inverse relationships reflect the "scarcity" of money, just as rent reflected the "scarcity" of land. But in each case it can be argued, along similar lines, that the scarcity is contrived.

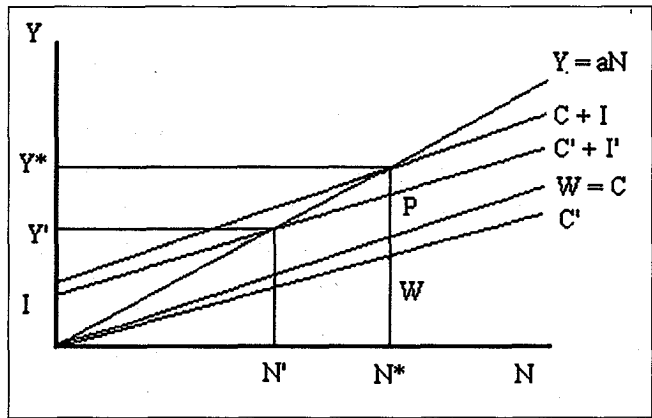


Figure 5.4. Effects of Interest on Saving and Investment

There is no classical dichotomy here; monetary and real factors interact. However, in the 19th-century craft economy the interest rate tended to rise and fall with the profit rate, moving procyclically. What if we imposed that condition here? Then the structure of asset prices would have to adapt to the real conditions of profitability—this could well imply that the long-term rate would tend at times to move independently of the short-term rate. A form of the dichotomy might reemerge (Nell 1998a). This takes our story in new directions; we need to consider whether it is adequate so far—and the answer is, NO, it wholly ignores rents.

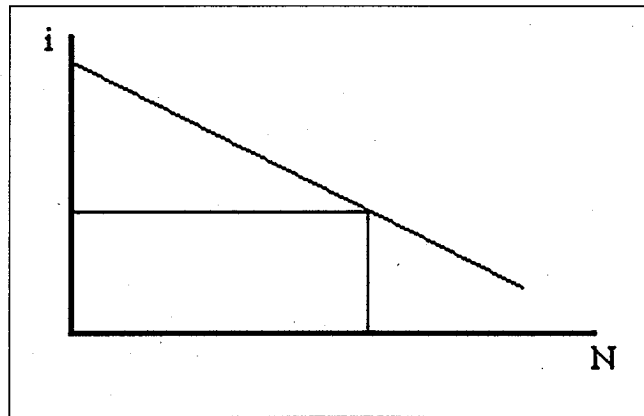


Figure 5.5. The Central Bank's Interest Rate Determines Employment

### Moving Ahead: Land

Land is used for many purposes—agriculture, of course, corporate farming. But land may also be used for building—housing developments, suburbs, shopping malls, theme parks, office complexes, etc., and these will each generate a different kind of rent. As industrialization proceeds, new factories will earn superprofits and at the same time pull up wages. In a mass production economy rents accruing to business are capitalized, and are treated as part of profits; rents paid are part of business expenses. Household rents are part of consumption spending or are imputed rents for owner-occupied housing. These are important features of the economy, and they make up a large share of it. The simple saving-investment-growth models here overlook all of this.

George would have found the analysis of the craft economy familiar; indeed, he worked out some of it. He didn't write much about supply and demand and prices, but the little bit he did fits in. He thought the system was self-righting until upset by excessive rents. His analysis of the frontier is outstanding; likewise his account of rents—up to the point where he argues that rents will often/always tend to rise relative to wages and to interest, which he in fact states may sometimes decline absolutely. Those arguments, we think, are unacceptable. Our perspective suggests that as industrialization proceeds, with steady improvements in technology, wages should tend to rise, and all businesses, except the most marginal, should earn superprofits.

George's overall perspective on growth—a classical perspective—is magnificent, and worthy of further development. This we have attempted in our account of George's claim that the value of land will tend to equal GNP, and in our reconstruction of the so-called Henry George Theorem on the tendency of total rents to approximate the total costs of government. Today's "Macro," however, is a wholly new way of looking at the economy; it brings in aggregate demand which is not part of George's thinking, but, on the other hand, aggregate demand does fit together with the classical viewpoint, which provides a fine account of the aggregate supply and distribution side. We've brought in macro thinking, because this is how we have to approach growth in the modern era, and we want now to bring in rents—which are missing from almost all contemporary growth models. Henry George gives us a good way to start.