4 The Marxist Model: Growth and Collapse

Karl Marx is one of those influential thinkers about whom much more has been written than he himself ever wrote. As the prophet of doom for capitalism and chief saint in the Communist hierarchy he is revered by hundreds of millions of people and reviled by other hundreds of millions. Because of the continuing importance of his ideas in shaping policies in Russia, China, and other Communist countries, and in determining the programs of Communist parties the world over, some knowledge of Marxist thought is essential if we wish to understand what is going on in the world.

Here, however, our purpose is quite different. We shall make no attempt to evaluate the Marxist system as a whole, but will do for that just what we have done for the Classical school: isolate the key propositions of its pure theory of economic development. Of course, Marx's theory of development was the core of his system, and because so few people can be detached about this system, our highly condensed presentation of his theory of development is unlikely to please. We cannot deal thoroughly with the Marxist literature. Yet no book on economic development with any pretensions to generality can ignore the Marxist theory. For, as Schumpeter says: [1]

> Based upon a diagnosis of the social situation of the 1840's and 1850's that was ideologically vitiated at its roots, hopelessly wrong in its prophecy of ever-

[1] Joseph Schumpeter, *History of Economic Analysis*, p. 573. See also his *Capitalism, Socialism, and Democracy* (3d ed.; New York, 1950), p. 21, for a eulogy of Marx as "a very learned man."

> increasing mass misery, inadequately substantiated both factually and analytically, Marx's performance is yet the most powerful of all. In his general schema of thought, development was not what it was with all the other economists of that period, an appendix to economic statics, but the central theme. And he concentrated his analytic powers on the task of showing how the economic progress, changing by itself by virtue of its own inherent logic, incessantly changes the social framework—the whole society in fact.

Marx never underestimated the capacity of the capitalist system for economic expansion. Indeed, in this respect he was perhaps more optimistic in his prognosis for capitalist development than Malthus or Mill. True, he expected capitalism to break down, but for sociological reasons, not because of stagnation, and only after a very high degree of development had been attained. To quote Schumpeter once more: [2]

> . . . nobody—not even the most ardent of optimists with whom Marx had this point in common—had then a fuller conception of the size and power of the capitalist engine of the future. With a quaint touch of teleology Marx said repeatedly that it is the "historical task" or "privilege" of capitalist society to create a productive apparatus that will be adequate for the requirements of a higher form of human civilization.

We are interested, then, in the basic elements of the Marxist theory of capitalist development and breakdown. We shall proceed as in the previous chapter, by stating the basic propositions and translating them into a set of simultaneous equations. Some of the propositions and equations are the same as those of the Classical school, from which Marx derived them in the first place; these propositions need not be elaborated again. Also, we hope that by now even those readers who have little previous experience with the use of symbols will have acquired the basic idea, so that we need not delay quite so often to translate symbols back into words.

Proposition 1: The Production Function

The Marxist ideas about the production function were the same as those of the Classical school, so we can use the same basic equation:

$$O = f(L, K, Q, T) \qquad (1)$$

Marx laid a good deal more stress on technological progress as the "motor" of capitalist growth, and by the same token, assigned a more important role to the entrepreneur. He saw more clearly than his predecessors—and most of his contemporaries—that there is a two-way relationship between investment and technological progress. Certainly investment is needed to take advantage of technological progress, but technological progress also provides the opportunities for profitable investment.

A second difference is that we must now mean by L the labor force actually employed. Marx incorporated the analysis of unemployment into

[2] *Ibid.*, p. 573.

his system, and population and employment cannot be treated as varying together in the Marxist system.

Marx also had a clearer picture of the interactions between development overseas and development in Europe; he thought of England and her colonies, or France and hers, as two sectors of a single economy, administered from the metropolitan country in the interests of the capitalists of that country. Like the Classicists, he regarded the supply of land (natural resources) in Europe as essentially fixed, and he considered Europe to be in the stage of decreasing average returns to labor on the land. But he saw more distinctly than they that foreign trade and investment offered a means of escaping these diminishing returns. His followers built on this insight in developing the Marxist theory of "imperialism" and "colonial wars." [3]

Proposition 2: Technological Progress Depends on Investment

As we have already noted, in the Marxist system this proposition could be stated either way around; but in order to stress points of agreement, we shall write Equation (2) of the Marxist system in the same form as Equation (2) of the Classical system:

$$T = T(I) \tag{2}$$

Proposition 3: Investment Depends on the Rate of Profits

Although the Marxist theory of investment resembled that of the Classical school, it was a bit more refined. The Classicists tended to think of profits as a category of income, accruing to capitalists, and providing funds for savings and investment. Marx thought of investment as depending, not merely on the size of capitalists' income, but on the rate of return on capital. Using R' to mean this rate of return,

$$I = I(R') \tag{3}$$

Marx himself used the term "surplus value," but surplus value was really what we have previously called profits, or the difference between total national income and the wages bill. He thought of capital as being divided into two parts. The first part is "variable capital," or working capital, which really boils down to payrolls, and which we will accordingly denote by W.[4] The second part is "constant capital," the stock of capital goods including inventories, which we shall continue to denote by Q.

[3] *Ibid.*, p. 49.

[4] In translating the Marxist concepts into contemporary terms, we are following Joan Robinson, *Essay on Marxian Economics* (London, 1942). It is perhaps worth emphasizing in passing that the Marxist concept of surplus value was not the difference between (the wages bill) and (the marginal productivity of labor) times (number of units of labor employed). It was simply the difference between national product and the wages bill. Throughout most of his analysis, Marx assumed pure competition; prices were equal to marginal labor cost and workers were paid according to their marginal productivity.

Proposition 4: The Rate of Profits Is the Ratio of Profits to Payrolls Plus Capital Costs

Instead of the fourth proposition of the Classical school, we can now substitute an identity or definition to which Marx attached great importance:

$$R' = \frac{O - W}{W + Q'} = \frac{R}{W + Q'} \tag{4}$$

Q' means capital goods and inventories currently used up in producing O. Here Q' can be regarded as having a fixed relation to both Q and O. Thus the rate of return, R', is really a rate of return on turnover; and it is profits in this sense that Marx considered to determine investment.

Now Marx had definite ideas about the historical relationships of these variables in a capitalist economy. Like the Classicists, he regarded technological progress as being labor saving and capital absorbing—as it seemed to be in nineteenth-century Europe. Consequently there was, according to Marx, a tendency for the ratio of "constant capital to variable capital" to rise; or as we would say now, a tendency for capital costs to rise relative to labor costs, or for capital per worker to rise. He seemed to regard the capital-output ratio, as well as the capital-labor ratio, as rising through time. The advantage in new techniques came only from saving labor. The great implications of these tendencies are apparent from a glance at Equation (4); unless they are accompanied by an increased spread between national product or income and the wages bill (increased "exploitation of the working class"), the increase in capital per worker must result in a fall in the rate of profit. By this process, rather than through diminishing returns to labor on the land, Marx explained the tendency of profits to fall.

Proposition 5: Wages Depend on the Level of Investment

The fifth equation takes the same form as in the Classical system, although now it has a somewhat different meaning. For in the Marxist system, the wages bill will depend on the level of employment as well as on the wage rate.

$$W = W(I) \tag{5}$$

Proposition 6: Employment Depends on the Level of Investment

Employment as well as wages depends on the level of investment. For Marx, however, innovation was essentially a labor-saving device (although he apparently did not think enough labor could be displaced by innovation to prevent the rate of profit from falling). Accordingly he put a good deal of emphasis on technological unemployment. An investment boom would tend to increase employment while it lasted, but each addition to the stock of capital would tend to swell the "reserve army" of technologically displaced workers. Employment rises only if investment goes up relative to the existing stock of capital. Thus we may write:

$$L = L(I/Q) \tag{6}$$

Proposition 7: Consumption Depends on the Wages Bill

We have seen that Malthus had already pointed out the danger that underconsumption might slow down economic growth; he had recognized that in a closed economy one productive sector constitutes the market for the other. Marx also stressed intersectoral relationships, but he conducted his analysis in terms of capital goods and consumers' goods sectors, rather than of industrial and agricultural sectors. These two kinds of sectoral breakdown are, of course, closely related but are not identical. Whereas Malthus emphasized capitalists' consumption and investment as providing the market for the industrial sector, Marx argued that investment cannot be profitable unless consumption increases enough to absorb the increased output of final products, and that however luxuriously capitalists may live, it is the workers who provide most of the market for consumers' goods. We may therefore write as our seventh equation,

$$C = C(W) \qquad (7)$$

Proposition 8: Profits Depend on the Level of Technology and the Level of Consumer Spending

Equation (4) is really an identity, and does not express a functional (causal) relationship. What determines the level of profits—the spread between gross national product or income and the amount paid out in wages? As in the Classical system, the level of technique is a major factor; technological progress is tantamount to the introduction of labor-saving devices, and so permits a given output to be produced with less labor. With wages steady at the subsistence level, an increase in man-year productivity permits an increase in profits. Unfortunately for the capitalists, there is a "contradiction" here—according to Marx. For workers do most of the consuming, and reducing labor costs of production will not raise profits if it lowers worker spending; the output must be sold if profits are to be made. So the profits-determining equation in the Marxist system takes the form,

$$R = R(T, C) \qquad (8)$$

It should be remembered, however, that Marx stressed the *rate* of profit (rate of return on capital) rather than the aggregate amount of profit as the factor determining capitalist behavior. It is the rate of profit, not the amount of profits, that must fall in the Marxist system. Thus what happens to R is important primarily for its effect on R' in Equation (4).

Closing the System. Three Identities

We shall have to exercise a bit more ingenuity to close the Marxist system than was necessary for the Classical one. We have, of course, the same identity as in the Classical model,

$$O = R + W \qquad (9)$$

and since Marx makes more of the division of the economy into capital

$$O = C + I \qquad (10)$$

Finally, we can treat current capital costs as bearing a fixed relation to the stock of capital, which we shall denote by u to mean "user cost," the added cost of using capital to produce goods and services rather than just holding it. We shall assume that u is given. Then with Equation (11),

$$Q' = u \cdot Q \qquad (11)$$

we have eleven equations and eleven unknowns.

Summary

Let us now bring the system together:

$$O = f(L, K, Q, T) \qquad (1)$$
$$T = T(I) \qquad (2)$$
$$I = I(R') \qquad (3)$$
$$R' = \frac{O - W}{W + Q'} = \frac{R}{W + Q'} \qquad (4)$$
$$W = W(I) \qquad (5)$$
$$L = L(I/Q) \qquad (6)$$
$$C = C(W) \qquad (7)$$
$$R = R(T, C) \qquad (8)$$

and the three identities:

$$O = R + W \qquad (9)$$
$$O = C + I \qquad (10)$$
$$Q' = u \cdot Q \qquad (11)$$

If we put this system side by side with the Classical model, we see both similarities and differences. Equations (1), (2), and (5) are the same in both systems. Equation (6) looks the same, but in the Classical system the L refers to the total labor force, which is thought to vary directly with the total population, whereas in the Marxist system it means labor actually employed. The consumption function, Equation (7), is crucial to the Marxist system, but plays no important role in the Classical system, except for Malthus, who would have written it differently. In Equation (3) of the Marxist system, investment depends on the *rate* of profit rather than on the level of profits, thus bringing into the system the "drag" imposed on new investment by the stock of capital already accumulated. Equation (10) of the Marxist system is really implicit in the Classical system as well, but it plays no great role in the latter, because the division of the economy into capital goods and consumers' goods sectors is less important in the Classical analysis. As we shall see more clearly below, Equation (4) of the Marxist system contains the kernel of his theory of breakdown.

The difference in the form of the profits-determining equation is of particular interest. Both Marx and the Classicists recognized improvements in technique as the one factor that could stave off for any length of time

population pressure as the cause of diminishing returns, rising labor costs, and falling profits, Marx stressed the "contradiction" that maintaining profits requires reducing the wages bill relative to gross national product, whereas success in doing so reduces workers' purchasing power, so that part of the output goes unsold, reducing profits after all. Marx did not believe that the working class tended naturally to reproduce on such a scale as forever to bring wages back down to the subsistence level; he regarded this Malthusian doctrine as "a libel on the human race." Even today, orthodox Marxists deny that population pressure can occur in a communist country; until recently the Chinese government leaders, well-trained Marxists that they are, have been extremely reluctant to admit that China, with its 650 million people, was, or could become, overpopulated. In the Marxist view, mass poverty is to be explained only by capitalist exploitation. It cannot continue in a communist society, whatever the level and rate of growth of the population.

The System in Operation

It is clear that the Marxist system has all the circularities of the Classical one, and a few of its own besides. With the Marxist, as with the Classical system, we could break into the circular flow anywhere and deduce from our set of relationships how the system will operate. Since Marx had his own very strong views as to how the system must evolve historically, we may follow him a bit further.

As already noted, Marx considered technological change the prime mover of the whole system. The technology of each era in a country's development determines not only the economic situation, but also the "style" of the whole society. As Engels put it in his Preface to *The Communist Manifesto,*

> In every historical epoch the prevailing mode of economic production and exchange, and the social organization necessarily following from it, form the basis upon which is built up, and from which alone can be explained, the political and intellectual history of that epoch.

For Marx, capitalism is merely one of a series of stages in the evolution of society toward the socialist state, which is the inevitable final form of economic, social, and political organization. Each stage of social evolution, with its characteristic technology and "style," breeds its particular kind of class struggle which leads to its breakdown and the emergence of the next, higher form of social organization. Thus feudalism arose out of primitive communism, but feudalism led to a struggle between serfs and feudal lords, out of which arose a class of emancipated serfs who became merchants and launched the first phase of capitalism. Capitalism brings a very high stage of technological advance. But capitalism leads eventually to a bitter class struggle between workers and capitalists, from which the workers will emerge victorious and establish the "dictatorship of the proletariat." This transitional phase will lead gradually to the full-fledged socialist (communist) society. Poverty will disappear. The state will "wither away," as a superfluous institution in a society without conflict. Each will contribute to national income according to his abilities and receive from it according to his needs.

In order to see how this prognosis for capitalism arises from the Marxist analytical framework, let us break into the system at Equation (4), which is the crucial one for the Marxist theory. It will help us to see the full significance of this equation, if we break up the wages bill into employment, L, and the wage rate, w, and if we break up total output into employment and output per man, o. We then have, substituting in Equation (4),

$$R' = \frac{L \cdot o - L \cdot w}{W + Q'} \quad \text{or} \quad R' = \frac{L(o - w)}{W + Q'} \tag{4a}$$

Now we can see the pincers in which the capitalists are caught. In order to survive the competitive race, they must be continually introducing improved techniques, which means accumulating capital, using more capital-intensive and less labor-intensive techniques. But the result is that Q, and so Q', increases relative to output. Under the circumstances, the only way to maintain R' is to increase the spread between o and w.

This end may be achieved in several ways. First, the wage rate can be cut to the subsistence level $\overline{w}$ and kept there—it cannot go lower. Second, more labor-saving devices can be introduced, raising o, while wages are held at or near $\overline{w}$. The trouble with this device, of course, is that (according to Marx) it can only be done by further increases in Q and Q'. Technological progress is a treadmill for capitalists—they must run ever faster just to stand still, for technological progress must always keep one step ahead of the rate of capital accumulation. However, labor-saving innovations help in another way; they displace workers, adding to the "industrial reserve army" of unemployed. Chronic technological unemployment weakens the bargaining power of workers, who are always competing for jobs against their unemployed brethren, thus making it easier for the capitalists to keep wages down to the subsistence level. Third, through the "stretch-out," hours can be increased and work speeded up without raising wages, thus again raising o without increasing w. Fourth, monopoly positions can be strengthened, to raise prices without raising wages.

All these devices for maintaining profits prove self-defeating. In the short run, they give rise to economic fluctuations. In the long run, they lead to revolution and the disappearance of the capitalist system.

The Theory of Economic Fluctuations

The Marxian theory of business cycles is scattered throughout his writings, and it takes a somewhat charitable interpretation of his *obiter dicta* on this subject to make them into a tight and systematic theory. Nevertheless, to Marx must go the credit for an early attempt at an explanation of the recurring cycles of prosperity and depression that mark

the development of capitalist societies. Moreover, he anticipated some basic ideas of contemporary theories of fluctuations.

Marx really had three different business cycle theories. The simplest stressed the disproportionalities in rates of expansion of different industries in an "unplanned" economy, where investment decisions are made by hosts of independent entrepreneurs. In the course of a boom, some industries turn out to be overextended because the output of complementary goods has not kept pace with them. Put in such terms, this theory of Marx is very similar to the later theory of Spiethoff. But if we lay primary emphasis on unbalanced expansion of the capital goods sector on the one hand and the consumers' goods sector on the other, as Marx seemed to do at points, we approach some of the more modern theories that are built around the savings-investment relationship, such as the "over-investment theory" of Professor F. A. von Hayek.

The second theory is closer to Keynes or Kalecki than to Hayek and explains the collapse of the boom in terms of the "shift to profits" and consequent underconsumption. The boom starts with innovation, which brings a temporary increase in profits which Marx called "superprofits" to indicate their transitory character and to distinguish them from true "surplus value," which is a more enduring spread between wages and output. The appearance of these superprofits, however, encourages an increase in investment. But this very gain of the capitalists at the expense of the workers proves the undoing of the boom; for capitalists tend to save a large proportion of increases in their incomes, in contrast to workers who spend any increase in income on consumption and who, by the same token, must reduce their consumption to the extent of any drop in their incomes. Monopolization fails for the same reason; capitalists tend to "price themselves out of the market." Thus investment in the boom fails to generate the purchasing power needed to absorb the increase in output of final products. Goods go unsold and profits drop again. Investment falls and depression ensues.

The third theory is less clearly stated than the other two, and at first blush, seems inconsistent with the second theory. For in this variant, the crisis emerges because the investment undertaken in the boom temporarily creates full employment and brings a temporary increase in wages. In such an inflationary boom, the innovations are not enough to maintain an increased spread between o and w; and since capital is being accumulated, the rate of profit must fall, leading to reduced investment and depression. In this model the shift to profits does not occur, and there is no clear reason why consumer spending should not be high enough to clear the market.

The apparent inconsistency between the second and third theories persists in the literature of today; underconsumption, the squeeze on profits through wage increases, and the drag on new investment through the increase in the stock of capital, all have their place in contemporary theories. One way of reconciling these two views is to say that either sequence may occur. "Weak booms" end, before full employment is reached and significant wage increases appear, through the shift to profits and underconsumption. "Strong booms" may survive the initial underconsumption and create inflationary conditions in which wage increases occur; these booms expire because of the squeeze on profits and the accumulation of capital.

Thus in the Marxist system economic fluctuations consist mainly of occasional booms, launched by investment undertaken to introduce new labor-saving techniques, which temporarily carry the economy above the trend line. But sooner or later, and usually sooner, the economy sinks back to its long-run trend, with its inevitable tendency for the rate of profits to fall. This trend toward a growing gap between potential and actual output shows up as deeper and deeper depressions, shorter and weaker booms.

Now everything the capitalists do to maintain profits in the face of this trend increases "the misery of the working class." The increasing tendency toward monopoly has another effect that helps to pave the way for revolution; it leads to the disappearance of the middle class. In the late stages of "high capitalism," capitalists become desperate indeed. Encountering increasing resistance at home, they turn to colonies for more ready exploitation of labor. Colonies also provide sources of cheap raw materials, new outlets for investment, and new markets in which monopoly positions can be established for the sale of final products. So valuable are these colonies in staving off the collapse of capitalism that the advanced capitalist countries fight imperialist wars for their possession.

All in vain. At best, these desperate measures of desperate men can bring only temporary respite. The rate of profits continues to decline, and capitalists cannot resist turning the screws on workers a bit more in the effort to save their way of life. Eventually the workers can stand it no longer; by sheer strength of numbers, they overthrow the system through revolution.

Conclusions: An Appraisal

As indicated above, any appraisal of Marx is likely to displease more people than it pleases; it will have too little vilification for some and too little veneration for others. But let us try, nonetheless, remembering that we are reviewing the earlier literature for the light it may throw on the development problems of today.

Obviously, Marx was a bad prophet. He was right, of course, in predicting the spread of communism, but both the establishment of communist societies and their subsequent evolution have taken forms very different from those envisaged by Marx. In particular, the countries that have gone Communist have not been those in which capitalist development has been most advanced but those in which it has lagged. For in the advanced capitalist countries workers have become increasingly prosperous rather than more miserable, and the middle class, far from disappearing, has grown until it dominates society. And in the Communist countries, poverty has been slow in disappearing and there are no signs of the state's "withering away."

We cannot attempt here to explain all the reasons for Marx's failure as

a prophet; we are concerned only with his analytical framework as a means of explaining economic growth. One obvious mistake was in not foreseeing the rise of powerful trade unions; but it may be questioned whether trade unions would have become so strong if the competitive position of unorganized labor had not become increasingly favorable in the first place. Let us note only two fundamental analytical errors. First, Marx did not see that innovations can be capital saving as well as labor saving. If capital-output ratios fall through improved techniques, as they frequently do, the rate of profit can rise even though wages rise too. Second, Marx was trapped by the labor theory of value which he took over from the Classical school. By measuring everything in terms of man-hours, he attached a quite wrong significance to a fall in the rate of profits in terms of man-hours. He did not see that a rise in man-hour productivity and in real wage rates can be accompanied by a rise in money profits (and real profits), even though profits in terms of man-hours may fall as man-hours become more valuable. And what really counts for capitalists is their actual income, not the number of man-hours' worth of labor a given amount of profit will buy. In other words, Marx did not foresee a process of economic development in which technological progress brings such increases in productivity and total output that both wages and profits can rise together.

On the other hand, Marx introduced certain ideas into the theory of economic development that have been there ever since. Virtually every writer on the subject since Marx has incorporated into his system the basic idea that technological progress is the mainspring of economic growth, and that innovation is the main function of the entrepreneur. By the same token investment decisions and capital accumulation are the core of most modern theories of growth, and in all theories these decisions are related somehow to the rate of return on capital. Another fundamental idea is that economic development under capitalism tends to take the form of fluctuations; economic growth is a destabilizing phenomenon. In particular, as Marx showed, stable growth requires maintenance of the proper balance between investment and consumption, and thus between savings and investment. Marx also pointed to the relationship between the savings-investment relationship on the one hand and the distribution of income on the other, a relationship that has remained a fundamental feature of growth theories ever since. He indicated the slenderness of the tightrope which an economy must walk for steady growth—wages either too high or too low relative to output can choke off investment and cause depression. This "damned if you do and damned if you don't" character of the boom has also remained a recognized feature of any complete analysis of cycles and trends. Marx also made employment and unemployment a major variable in the system.

These are sizable bricks for the construction of a theory of growth, even if Marx's own structure collapsed because some of its pillars were faulty. So far as the problem of steady growth in advanced capitalist countries is concerned, Marx's main contribution, apart from these bricks, was in putting capitalism in its historical setting, which helps a good deal

in evaluating its past and its future.

So far as its pure economics is concerned, Marx's system is less directly applicable to problems of underdeveloped countries than that of Malthus. Marx did not really think of underdevelopment as an enduring state; underdeveloped countries were simply precapitalist ones, which, unfortunately, would have to go through the capitalist phase before they could attain the Elysian Fields of communism. His exclusion of the possibility of population pressure is a severe handicap in trying to apply his system to most underdeveloped countries. Perhaps just because he did not believe population pressure possible he also missed the fundamental feature of "dualism"; he did not see that technological progress might be confined to one sector of an economy while leaving the rest of the economy virtually untouched.

The Marxist sociological and political theory, however, provides some clues to the economic history of underdeveloped countries. It suggests to us that we look at power relations among social classes and see whether these relations are of a sort that imposes barriers to spontaneous growth. It suggests that we should look for an explanation of colonial policies in the economic conditions of the home countries, rather than economic conditions in the colonies themselves. It suggests, too, that part of the explanation of underdevelopment in the former colonies might be traced to these policies. As we shall see in more detail below—for reasons not fully explained by Marx himself—in some underdeveloped countries conditions occurred rather like those Marx predicted for advanced ones: labor was indeed exploited; wages were indeed kept close to subsistence levels; a "reserve army" of chronic unemployment did in fact exist; the class structure was sharply defined and a middle class virtually non-existent; in some cases there is even evidence of "increasing misery." That such conditions could result in revolution of one sort or another few people would deny.

We must be wary of the pitfalls in the Marxist system, but for all its errors, the Marxist theory of economic development has much to contribute to an understanding of development or the lack of it.