

Development Policy

Lecture Note 5

The Lewis Model

Sir Arthur Lewis was one of the most influential development economists of the 20th century. He was born and raised in St. Lucia, an island in the British West Indies, and studied at the London School of Economics. Upon completing his studies, he was hired as a lecturer in economics at the University of Manchester, which was a very rare at the time because British Universities did not recruit many black teachers. During his career he taught at Manchester and at Princeton University in the United States, and for a time he was Vice-Chancellor (rector) of the University of the West Indies, the regional university of the former British colonies in the Caribbean. He was awarded the Nobel Prize in 1979.

Although Lewis spent most of his career working on economic problems in Africa and Latin America and the Caribbean, his ideas have always been relevant to Asia. Indeed, Lewis recounts that his famous model of the labor surplus economy came to him during a visit to Bangkok. He writes,

From my undergraduate days, I had sought a solution to the question of what determines the relative prices of steel and coffee...Another problem that troubled me was historical. Apparently, during the first fifty years of the industrial revolution, real wages in Britain remained more or less constant while profits and savings soared. This could not be squared with the neoclassical framework, in which a rise in investment should raise wages and depress the rate of return on capital.

One day in August, 1952, walking down the road in Bangkok, it came to me suddenly that both problems have the same solution. Throw away the neoclassical assumption that the quantity of labor is fixed. An "unlimited supply of labor" will keep wages down, producing cheap coffee in the first case and high profits in the second case. The result is a dual (national or world) economy, where one part is a reservoir of cheap labor for the other. The unlimited supply of labor derives ultimately from population pressure, so it is a phase in the demographic cycle.

Lewis's insight on that day in 1952 was that the rural migrants flooding into Bangkok to find work in the "modern" sector of the economy would hold down wages even in a context of high levels of capital investment. That is to say, a significant proportion of the labor force in developing countries is unemployed or underemployed. The presence of

“surplus” labor means that wages will not rise even as demand for labor increases. The additional demand soaks up surplus labor at the existing or “subsistence” wage rate.

As Lewis’s notion of the subsistence wage was and remains controversial among economists, it is worth spending a few minutes to clarify what he means by it. The first suggestion that wages will remain around the level required for human survival comes from Thomas Malthus in his famous *Essay on the Principle of Population* (1798). Malthus was concerned that population growth tends to grow faster than food production, which means that demand for food is always greater than supply. As population growth increases, excess demand for food results in food price inflation, and a fall in real wages (money wages/prices). Falling real wages reduce population growth through both decreasing fertility and rising mortality rates. Thus wages would tend to gravitate towards the level that would keep a worker and his/her family alive at the lowest possible level of subsistence. If wages rose above the subsistence level, population growth would increase and with it demand for food and food price inflation. If wages fell below the level of subsistence, fertility would decline and mortality rates rise, reducing population growth.

Malthus’s subsistence wage is concerned with the average rather than the marginal productivity of labor. You will recall from microeconomics class that in theory employers will only hire labor up to the point at which the wage rate equals the marginal revenue product of labor. Thus in a competitive economy population growth is less important is the level of technology and the price of output, which will determine the marginal revenue product. Does this mean that the subsistence wage reflecting the average productivity is not relevant? No, because Malthus was thinking of farm households operating on rented land and not competitive firms. They share the proceeds of their farm labor equally and do not “pay” workers depending on how much they produce per day.

Lewis’s subsistence wage in the traditional sector is related to Malthus’s subsistence wage in agriculture, but the two are not necessarily identical. Given surplus labor, the subsistence wage in the traditional sector is set by the average productivity of labor. It may be equal to the minimum income required for subsistence plus a “mark up” or additional income determined by custom or tradition. For example, wages for rice harvesting in Asian villages are often established on the basis of traditional arrangements under which harvesters receive a proportion of the rice that they harvest. The amount paid to laborers may adjust to labor supply (when more workers are available the proportion paid to workers falls) but the level may not fall as far as subsistence because of the landowners’ desire to maintain peaceful relations with numerous landless workers. This traditional wage becomes a reference wage that is used for other activities, including casual wage labor outside of agriculture.

In a context of surplus labor (“unlimited supplies of labor in Lewis’s terms), movements of workers from the traditional to the modern sector *do not* result in a decrease in production in the traditional sector. The marginal product of labor in the traditional sector is zero. This could mean that family farms have more labor than they need, or that some people who “work” in the traditional sector are idle most of the time. Either way, labor moves from the traditional to the modern sector without reducing the supply of food to the modern sector. This is crucial, since a reduction in the food supply would increase food prices and hence reduce the real wage in the modern sector.

Is it essential to the model that the marginal product of labor in the traditional sector is zero? The answer is yes if land and technology are fixed: if reducing labor supply in the traditional sector reduces total output, then moving workers to the modern sector will cause food price inflation, lower real wages and no movement of labor. The experience of Southeast Asian economies suggests another outcome. In these countries, surplus labor did exist in the traditional sector of the economy. However, land and technology in food production was not fixed. Land area effectively increased because of the development of irrigation systems that allowed for double and even triple cropping of rice. Technology changed in the form of Green Revolution seed-water-fertilizer innovations that increased productivity per hectare *and* per person-day of labor. The marginal product of labor increased as a result, and with it the subsistence wage. Nevertheless, labor continued to move out of the traditional sector because there was insufficient demand for labor (some people were still idle despite productivity growth) and because higher wages in the traditional sector did not close the gap between traditional and modern sector wages.

The important point is that movements of labor from the traditional to the modern sector in Southeast Asia were accompanied by an increase in the total supply of food, allowing for non-inflationary growth of the modern sector. This was an important factor in Southeast Asia’s success. It is of course possible to import the additional supplies of food required to hire workers in the modern sector. However, developing economies are generally foreign exchange constrained, and using scarce dollars to import food means that dollars are not available to import capital and intermediate goods.

Workers move from the traditional to the modern sector because employers in the latter set the wages higher than the subsistence wage in the traditional sector. Traditional sector wages set the “floor” for modern sector wages, but modern sector wages are higher than this level to attract workers. Lewis thought the gap between traditional and modern sector wages would be about 30 percent. The precise level does not matter as much as the concept that even given unlimited supplies of labor urban employers will pay more than the minimum level of subsistence.

Since wages in the modern sector are fixed and set with reference to the subsistence wage rather than the marginal product of labor in the modern sector, investors earn profits in the modern sector. These profits generate the capital that they need to reinvest in modern industries. Here the idea of increasing returns to scale is important. If increasing returns are in effect, larger enterprises will be able to increase the rate of profit in a context of constant real wages. Investors can reap large profits by importing technologies from abroad and applying them without much innovation or adaptation.

The Lewis process continues until all surplus labor is absorbed in the modern sector. At this “turning point,” real wages in the modern sector begin to increase because additional demand for labor is not satisfied by transfer of unemployed labor from the traditional sector.

How well does Lewis’s theory fit the empirical facts of economic development? Masoud Karshenas provides evidence that at least part of the explanation for East Asia’s superior performance relative to Africa can be traced to Lewis-type processes. Karshenas begins with estimates of land and labor productivity in agriculture in Africa and Asia. Both regions saw rapid increases in land productivity, although Asia’s land productivity is much higher than Africa’s largely because of geographic and climatic factors. Most importantly, Asia has superior access to water, and most East Asian societies have achieved high population densities owing to the productivity of wet rice agriculture. However, differences emerge when we consider the growth of labor productivity in agriculture. While Asian countries have for the most part sharply increased output per labor day in agriculture during the period of the Green Revolution, African countries have achieved only modest gains. As we have seen, labor productivity in agriculture is important as it enables labor to move from traditional to modern sector activities without reducing food output or necessitating food imports.

Next Karshenas considers the relationship between economy-wide labor productivity and real wages. He finds that while real wages rose marginally in Asia over the period in question labor productivity rose more than eight-fold. Meanwhile, in the African countries real wages and productivity rose in tandem from the 1960s to the 1970s. In the 1980s real wages fell back more than labor productivity, but not by much.

One interpretation of the evidence is that Asia successfully promoted investment in the modern sector by maintaining stable real wages as labor productivity rose. This created a surplus that could be reinvested in modern sector activities. The maintenance of stable real wages as labor moved from the traditional to the modern sector was made possible by the rapid growth of labor productivity in agriculture.