

# Lewis' Theory of Unlimited Supplies of Labour

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## THE LEWIS THEORY

**Two Sector Economy.** Prof. W. Arthur Lewis has developed a very systematic theory of *Economic Development with Unlimited Supplies of Labour*.<sup>1</sup> Like the classical economists, he believes that in many underdeveloped countries an unlimited supply of labour is available at a subsistence wage. Economic development takes place when capital accumulates as a result of the withdrawal of surplus labour from the “subsistence” sector to the “capitalist” sector. The capitalist sector is that part of the economy which uses reproducible capital and pays capitalists for the use thereof.’ It employs labour for wages in mines, factories, and plantations for earning profit. The subsistence sector is that part of the economy which does not use reproducible capital. In this sector, output per head is lower than in the capitalist sector.

Lewis starts his theory with the assertion that the classical theory of perfectly elastic supply of labour at a subsistence wage holds true in the case of a number of underdeveloped countries. Such economies are over-populated relatively to capital and natural resources so that the marginal productivity of labour is negligible, zero or even negative. Since the supply of labour is unlimited, new industries can be established or existing industries expanded without limit at the current wage by drawing upon labour from the subsistence sector. The current wage is what labour earns in the subsistence sector, *i.e.*, the subsistence wage. The main sources from which workers would be coming for employment at the subsistence wage as economic development proceeds are “the farmers, the casuals, the petty traders, the retainers (domestic and commercial), women in the household and population growth.” But the capitalist sector also needs skilled workers. Lewis argues that skilled labour is only a “quasibottleneck, a temporary bottleneck” which can be removed by providing training facilities to unskilled workers.

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<sup>1</sup> 'This is the title of an article published by W. A. Lewis in the *Manchester School*, May, 1954. Reprinted in Aggrawal and Singh, *op. cit.*, pp. 400-449. Also “Unlimited Labour” Further notes : *The Manchester School*. Jan., 1958.

**Capitalist Surplus.** Now the question is what determines the subsistence wage at which the surplus labour is available for employment in the capitalist sector? It depends upon the minimum earnings required for subsistence. To be precise, the wage level cannot be less than the average product of the worker in the subsistence sector. It may, however, be higher than this, if the farmers are to pay rent or food costs more or if they feel that psychic disutilities of leaving home are large. Though “earnings in the subsistence sector set a floor to wage in the capitalists sector,” yet in practice capitalist wages are more than 30 per cent<sup>2</sup> higher than subsistence wages due to:

(a ) a substantial increase in the output of the subsistence sector which by raising real income might induce workers to ask for a higher capitalist wage before offering themselves for employment;

(b) if with the withdrawal of labour from the subsistence sector, total product remains the same, the

average product and hence the real income of those remaining behind will rise and the withdrawn workers might insist on a higher wage in the capitalist sector;

(c) the high cost of living and some humanitarian consideration may move the employers to raise the real wage, or government may encourage trade unions and support their wage-bargaining efforts. The supply of labour is, however, considered to be perfectly elastic at the existing capitalist wage.

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2. In the 1958 article, Lewis estimated a gap of 50 per cent. In fact, the size of this margin cannot be precisely stated and will vary with local circumstances.

**Capital Formation Depends on Capitalist Surplus.** Capitalists aim at profit maximisation. It is they who save and automatically invest what they save. Since the marginal productivity of labour in the capitalist sector is higher than the capitalist wage, this results in capitalist surplus. This surplus is reinvested in new capital assets. Capital formation, takes place and more people are employed from the subsistence sector. This process continues till the capital-labour ratio rises and the supply of labour becomes inelastic and the surplus labour disappears. Thus capital formation depends on the capitalist surplus. The Lewis theory can be explained with the help of Fig. 1. The horizontal axis measures the quantity of labour employed and the vertical axis, its wage and marginal product.  $OS$  represents average subsistence wage in the subsistence sector, and  $OW$  the capitalist wage. At  $OW$  wage in the capitalist sector, the supply of labour is unlimited, as shown by the horizontal supply curve of labour  $WW$ . In the beginning, when  $ON_1$  labour is employed in the capitalist sector, its marginal productivity curve is  $P_1L_1$  and the total output of this sector is  $OP_1O_1N_1$ . Out of this workers are paid wages equal to the area  $OWQ_1N_1$ . The remaining area  $WP_1Q_1$  shows surplus output. This is the capitalist surplus or total profit earned by the capitalist sector. When this surplus is reinvested, the curve of marginal productivity shifts upwards to  $P_2L_2$ . The capitalist surplus and employment are now larger than before being  $WP_2Q_2$  and  $ON_2$  respectively. Further reinvestments raise the marginal productivity curve and the level of employment to  $P_3L_3$  and  $ON_3$  and so on, till the entire surplus labour is absorbed in the capitalist sector. After this, the supply curve  $WW$  will slope from left to right upwards like an ordinary supply curve, and wages and employment will continue to rise with development.

Thus, capital is formed out of *profits earned* by the capitalists. According to Lewis, if technical progress is capital-saving, it may be considered as an increment in capital, and if it is labour-saving, it may be considered as an increment in the marginal productivity of labour. As such, he does not make any distinction between the growth of technical knowledge and the growth of productive capital and treats them as a “single phenomenon” with the result that technical progress tends to raise profits and increase employment in the capitalist sector.

**Role of the State and Private Capitalists.** “The central problem in the theory of economic development,” according to Lewis, “is to understand the process by which a community which was previously saving and investing 4 or 5 per cent of its national income or less converts itself into an economy where voluntary saving is running at about 12 to 15 per cent of national income or more. This is the central problem because the central fact of economic development is rapid capital accumulation (including knowledge and skills with capital). In underdeveloped countries with surplus labour, only 10 per cent of the people with the largest income save who receive about 40 per cent of the national income.

The wage and salary classes hardly save 3 per cent of the national income. But the dominant classes consisting of landlords, traders, moneylenders, priests, soldiers, princes are engaged in prodigal consumption rather than in productive investments. It is, therefore, the state capitalist and indigenous private capitalists who create capital out of profits earned. "The indigenous private capitalist is bound up with the emergence of new opportunities, especially something that widens the market, associated with some new technique which greatly increases the productivity of labour, and hence the capitalist surplus. The state capitalist, on the other hand, can accumulate capital even faster than the private capitalist, since he can use for this purpose not only the profits of the capitalist sector, but also what he can force or tax out of the subsistence sector." Thus, once a capitalist sector has emerged it is only a matter of time before it becomes sizable. If the opportunities for using capital productivity increase rapidly, the surplus will also grow rapidly, and the capitalist class with it.

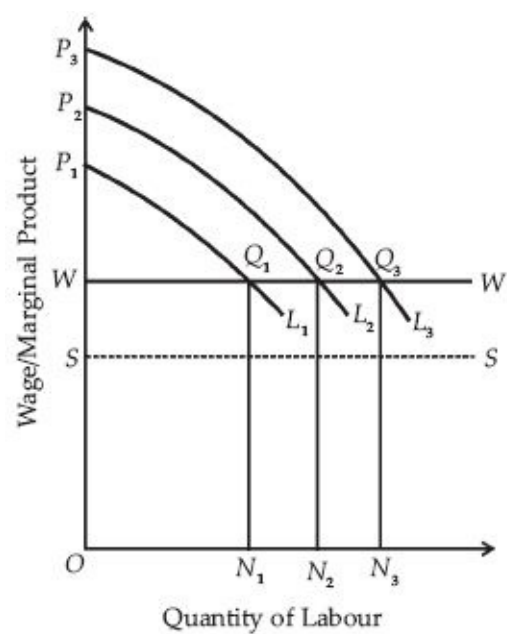


Fig. 1.

**Capital Formation through Bank Credit.** But capital is created not only out of profits, it is also created out of bank credit. In an underdeveloped economy which has abundant idle resources and shortage of capital, credit creation has the same effect on capital formation as profits. It will raise output and employment. Credit-financed capital formation, however, leads to inflationary rise in prices for sometime. When the surplus labour is engaged in the capitalist sector and paid out of created money, prices rise because income increases while consumer goods output remains constant. This is only a temporary phenomenon, for as soon as capital goods start producing consumption goods, prices start falling. In the words of Lewis, "Inflation for the purpose of capital formation is a very different kettle of fish. It is self-destructive. Prices begin to rise but are sooner or later overtaken by rising output, and may, in the last stage, end up lower than they were at the beginning." The inflationary process also comes to an end "when voluntary savings increase to a level where they are equal to the inflated level of investment." As capital formation is taking place all the time, output and employment rise continuously and so do profit. Since higher profit lead to higher saving, a time will come when savings increase so much that new investments can be financed without recourse to bank credit.

This analysis also applies to the government which receives back the inflation financed money in the form of taxes. *Secondly*, when national income increases with rising output, it is not required to resort to deficit financing. Given abundant labour and scarce physical resources, the effect of capital formation either through taxation or credit creation is the same on output. Since backward economies are faced with unlimited supplies of labour, the Lewis theory is primarily concerned with this problem.

**End of the Growth Process.** The theory shows that "if unlimited supplies of labour are available at a constant real wage, and if any part of the profit is reinvested in productive capacity, profit will grow continuously relatively to the national income and capital formation will also grow relatively to national income." But the process of growth cannot go on indefinitely, if as a result of capital accumulation no surplus labour is left. It may also stop if despite the existence of surplus labour, real wages rise so high as to reduce the capitalist profit to the level where they are all consumed and nothing is left, for net investment. This may happen in any one of the four ways:

(a) if the capitalist sector expands so rapidly that it reduces absolutely the population in the subsistence sector, the average productivity of labour rises in the latter sector because there are very few people to share the product and so the capitalist wage rises in the former sector (in the diagram SS and WW will shift upwards and reduce profit);

(b) if as a result of the expansion of the capitalist sector relatively to the subsistence sector, the terms of trade turn against the former with rising prices of raw materials and food, the capitalists will have to pay higher wages to the workers;

(c) if the subsistence sector adopts new techniques of production, real wages would rise in the capitalist sector and so reduce the capitalist surplus; and

(d), if the workers in the capitalist sector imitate the capitalist way of life; and agitate for higher wages and if successful in raising their wages, the capitalist surplus and the rate of capital formation will be reduced.

**In Open Economy.** When capital accumulation is adversely affected by any of these factors, it can continue by encouraging mass immigration or by exporting capital to such countries as possess abundant labour at subsistence wage. Both these possibilities are, however, ruled out by Lewis himself.

*First*, mass immigration of unskilled labour is not possible because trade unions in the high-wage countries oppose it. They fear that labour imports would bring down wages to the subsistence level of the poorest country.

*Second*, the effect of capital exports is to reduce the creation of fixed capital at home and hence to reduce the demand for labour and wages in the capital-exporting country. But the reduction in wages is offset if capital exports cheapen the things which workers import because their real wages will rise. On the other hand, the reduction in wages is further encouraged if capital exports raise the cost of imported things as the real wages of workers will fall. So the effect of capital exports cannot be assessed with definiteness.

## **A CRITICAL APPRAISAL**

The Lewis theory is applicable to overpopulated underdeveloped countries under certain set conditions. Its applicability is, therefore, circumscribed by its assumptions which are the basis of criticisms discussed below:

**1. Wage Rate not Constant in the Capitalist Sector.** The theory assumes a constant wage rate in the capitalist sector until the supply of labour is exhausted from the subsistence sector. This is unrealistic because the wage rate continues to rise over time in the industrial sector of an under developed economy even when there is open unemployment in its rural sector.

**2. Not Applicable if Capital accumulation is Labour Saving.** Lewis assumes that the capitalist surplus is reinvested in productive capital but according to Reynolds,<sup>3</sup> if the productive capital happens to be labour saving, it would not absorb labour and the theory breaks down. This is shown in Fig. 2 where the curve  $P_2L_2$  has a greater negative slope than the curve  $P_1L_1$ , thereby showing labour-saving technique. With the shifting of the marginal productivity curve upwards from  $P_1L_1$  to  $P_2L_2$ , the total output has risen

substantially from  $OP_1Q_1N_1$  to  $OP_2Q_1N_1$ . But the total wage bill  $OWQ_1N_1$  and the labour employed  $ON_1$  remain unchanged.

**3. Skilled Labour not a Temporary Bottleneck.** Given an unlimited supply of labour, Lewis assumes the existence of unskilled labour for his theory. Skilled labour is regarded as a temporary bottleneck which can be removed by providing training facilities to unskilled labour. No doubt skilled labour is in short supply in underdeveloped countries but skill-formation poses a serious problem, as it takes a very long time to educate and train the multitudes in such countries.

**4. Lack of Enterprise and Initiative.** The Lewis theory is based on the assumption that a capitalist class exists in underdeveloped countries. In fact, the entire process of growth depends on the existence of such a class which has the necessary skill to accumulate capital. In reality, such countries lack capitalists with necessary enterprise and initiative.

**5. Multiplier Process does not operate in LDC.** Again, the theory assumes that capital accumulation takes place when the capitalist class continues to reinvest profits. It, therefore, presupposes the operation of the “investment multiplier” which is not applicable to underdeveloped countries.<sup>4</sup> For if profits are reduced somehow or the prices of wage goods rise, the process of capital formation will stop before all the surplus labour is absorbed.

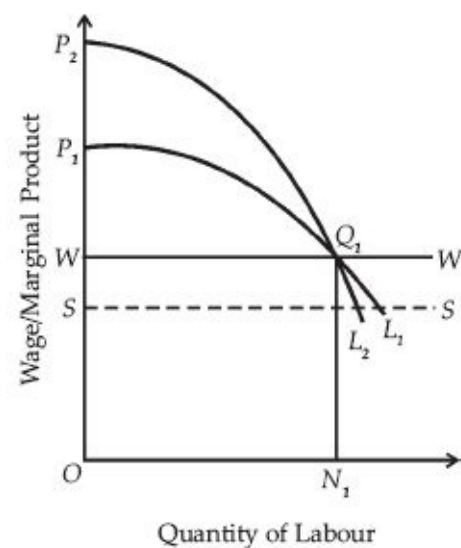


Fig. 2

<sup>3</sup> Lloyd G. Reynolds, “Wages and Employment in a Labour-Surplus Economy,” *A.E.R.* .. September, 1956.

<sup>4</sup> See Chapter on “*Keynesian Theory of Development* .”

**6. One sided Theory.** This is a one-sided theory because Lewis does not consider the possibility of progress in the agricultural sector. As the industrial sector develops with the transfer of surplus labour, the demand for food and raw materials will rise which will, in turn, lead to the growth of the agricultural sector.

**7. Neglects Total Demand.** Lewis does not study the problem of aggregate demand. He assumes that whatever is produced in the capitalist sector is either consumed by itself or is exported. He does not even analyse the possibility of the capitalist sector selling its products to the subsistence sector. In case, it so happens, the growth process may come to a halt much earlier through unfavourable terms of trade or the subsistence sector adopting new techniques of production to meet the expanding raw material demand of the capitalist sector.

**8. Mobility of Labour not so Easy.** Higher capitalist wage will not lead to the movement of surplus labour from the subsistence sector to the capitalist sector. People are so intensely attached to their family and land that they do not like to leave their kith and kin. Moreover, differences in language and custom, the problems of congestion, housing and high cost of living in the capitalist sector stand in the way of mobility of labour to this sector. This is the main weakness of the theory.

**9. Marginal Productivity of Labour not Zero.** Schultz does not agree that the marginal productivity of

labour in overpopulated underdeveloped countries is zero or negligible. If it were so, the subsistence wage would also be zero. The fact is that every worker receives the subsistence wage, may be in kind, if not in cash. It is, therefore, difficult to find out the exact number of surplus labourers who are to move to the capitalist sector, their number hardly exceeding 5 per cent, as is now generally accepted.

**10. Productivity falls with Migration of Labour from the Subsistence Sector.** Lewis assumes that when the surplus labour is withdrawn from the subsistence sector to the capitalist sector, the agricultural production remains unaffected in the subsistence sector. But the fact is that withdrawal of workers from the farms will reduce output. As pointed out by Schultz, “there is no evidence for any poor country anywhere that would suggest that a transfer of even some fraction, say 5 per cent of the existing labour-force out of agriculture, with other things being equal, could be made without reducing its production.”

**11. Low Income Groups also Save.** It is not correct to say that only 10 per cent of the people with the largest income save. In fact, people, with low incomes also save due to social reasons and even small farmers save for capital accumulation in underdeveloped countries, whereas high income groups save less because they spend more under the influence of the demonstration effect.

**12. Inflation, not Self-Destructive.** Lewis’s view that inflation for the purpose of capital formation is self-destructive is difficult to believe in the face of acute shortage of consumer goods. Production of consumer goods fails to increase rapidly due to structural rigidities. On the other hand, the marginal propensity to consume of the people is near unity, so that all increases in income lead to inflationary rise in prices.

**13. Inefficient Tax Administration.** Lewis’s contention that taxation will mop up increasing income cannot be accepted because the tax administration in underdeveloped countries is not so efficient and developed as to collect taxes sufficient enough for capital accumulation.

**Conclusion.** Despite these limitations, the Lewis theory has the merit of explaining in a very clear cut way the process of development. This two sector theory has great analytical value. It explains how low capital formation takes place in underdeveloped countries which have plethora of labour and scarcity of capital. His study of the problems of credit inflation, population growth, technological progress, and international trade gives the theory a touch of realism.

# CHAPTER

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# Fei-Ranis Theory

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## INTRODUCTION

John Fei and Gustav Ranis in an article entitled “*A Theory of Economic Development*” analyse “the transition process through which an underdeveloped economy hopes to move from a condition of stagnation to one of self-sustained growth.” Their theory is an improvement over Lewis’s theory of Unlimited Supplies of Labour because Lewis failed to present a satisfactory analysis of the growth of agricultural sector. The analysis that follows is based on the original article and the subsequent modifications<sup>1</sup> made by the authors in their theory of the development of a dual economy.

## THE THEORY

The theory relates to an underdeveloped labour-surplus and resource-poor economy in which the vast majority of the population is engaged in agriculture amidst widespread unemployment and high rates of population growth. The agrarian economy is stagnant, people are engaged in traditional agricultural pursuits. Non-agricultural pursuits exist but they are characterised by a modest use of capital. There is also an active and dynamic industrial sector. Development consists of the re-allocation of surplus agricultural workers, whose contribution to output is zero or negligible, to the industrial sector where they become productive at a wage equal to the institutional wage in agriculture.<sup>2</sup>

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<sup>1</sup> John G.H. Fei and Gustav Ranis, “A Theory of Economic Development,” *AER*, Vol. 51, September 1961; *Development of Labour Surplus Economy*, 1964; and “Agrarianism, Dualism and Economic Development,” in *The Theory and Design of Economic Development* (eds.) I. Adelman and F. Thorbecke, 1966.

## ASSUMPTIONS

In presenting their theory of economic development, Fei and Ranis make the following assumptions:

1. There is a dual economy divided into a traditional and stagnant agricultural sector and an active industrial sector.
2. The output of the agricultural sector is a function of land and labour alone.
3. There is no accumulation of capital in agriculture except in the form of land reclamation.
4. Land is fixed in supply.
5. Agricultural activity is characterised by constant returns to scale with labour as a variable factor.
6. It is assumed that the marginal productivity of labour becomes zero at some point. If population exceeds the quantity at which the marginal productivity of labour becomes zero, labour can be transferred



to the industrial sector without loss in agricultural output.

7. The output of the industrial sector is a function of capital and labour alone. Land has no role as a factor of production.
8. Population growth is taken as an exogenous phenomenon.
9. The real wage in the industrial sector remains fixed and is equal to the initial level of real income in the agricultural sector. They call it the institutional wage.
10. Workers in either sector consume only agricultural products.

Given these assumptions, Fei and Ranis analyse the development of a labour-surplus economy into three phases. In the first phase, the disguised unemployed workers, who are not adding to agricultural output, are transferred to the industrial sector at the constant institutional wage. In the second phase, agricultural workers add to agricultural output but produce less than the institutional wage they get. Such workers are also shifted to the industrial sector. If the migration of workers to the industrial sector continues, a point is eventually reached when farm workers produce output equal to the institutional wage. This begins the third phase which marks the end of the take-off and the beginning of the self-sustained growth when farm workers produce more than the institutional wage they get. In **this** phase, the surplus labour is exhausted and the agricultural sector becomes commercialised.

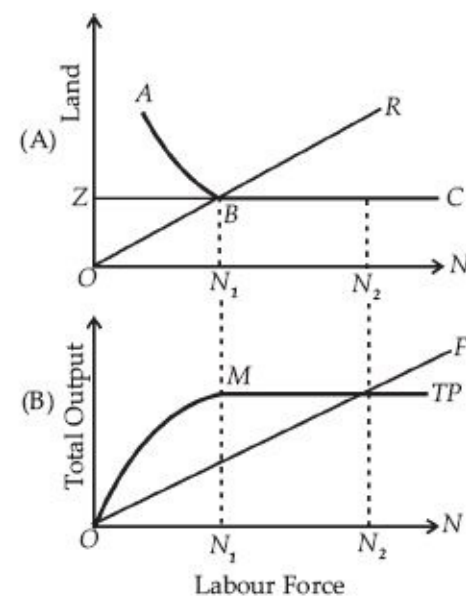


Fig. 1.

2. Before starting this model, students should first read the Lewis Model in the previous chapter.

Fig. 1 (A) shows the functioning of the agricultural sector where agricultural goods are produced by the application of labour ( $L$ ) and land ( $Z$ ). Labour is measured on the horizontal axis and land on the vertical axis. The ray  $OR$  shows the stage of production. The curve  $ABC$  is the production contour of agricultural goods. Assuming land to be fixed at  $OZ$ , labour  $ON_1$  produces the maximum output. The total productivity of labour is represented by  $TP$  curve in Fig. 1 (B). If more labour is employed beyond  $N_1$  with land  $OZ$ , production would not increase. This is because the total productivity of labour becomes constant beyond point  $M$  on the  $TP$  curve. Assuming that  $ON_2$  is the total labour force, engaged in agriculture  $ON_1$  is the non-redundant labour and  $N_1N_2$  is the redundant labour force.  $N_1N_2$  number of workers do not make any positive contribution to output and their marginal physical productivity approaches zero beyond point  $M$  on the  $TP$  curve. Such workers are disguised unemployed.

Economic development takes place when these workers are shifted from the agricultural sector to the industrial sector in three phases. This is illustrated in Fig. 2(A), (B) and (C) where Panel (A) depicts the industrial sector and panels (B) and (C) the agricultural sector.

Let us take Panel (C) where the labour force in the agricultural sector is measured from right to left on the

horizontal axis  $ON$  and agricultural output downward from  $O$  on the vertical axis  $OY$ . The curve  $OCX$  is the total physical productivity curve (TPP)<sup>3</sup> of the agricultural sector. The horizontal portion  $CX$  of the curve shows that the total productivity is constant in this region so that the marginal productivity of  $MN$  labour is zero. Thus  $MN$  labour is surplus and its withdrawal to the industrial sector will not affect agricultural output. If, however, it is presumed that the entire labour force  $ON$  is engaged in the agricultural sector, it produces  $NX$  total agricultural output. Assuming that the entire output  $NX$  is consumed by the total labour force  $ON$ , the real wage is equal to  $NX/ON$  or the slope of the ray  $OX$ . This is the institutional wage.

The allocation process in three phases during the take-off is depicted in Panel (B) of the Fig. 2 where the total labour force is measured from right to left on the horizontal axis  $ON$  and the average output on the vertical axis  $NV$ . The curve  $NMRU$  represents the marginal physical productivity of labour (MPP) in the agricultural sector.  $NW$  is the institutional wage at which the workers are employed in this sector.

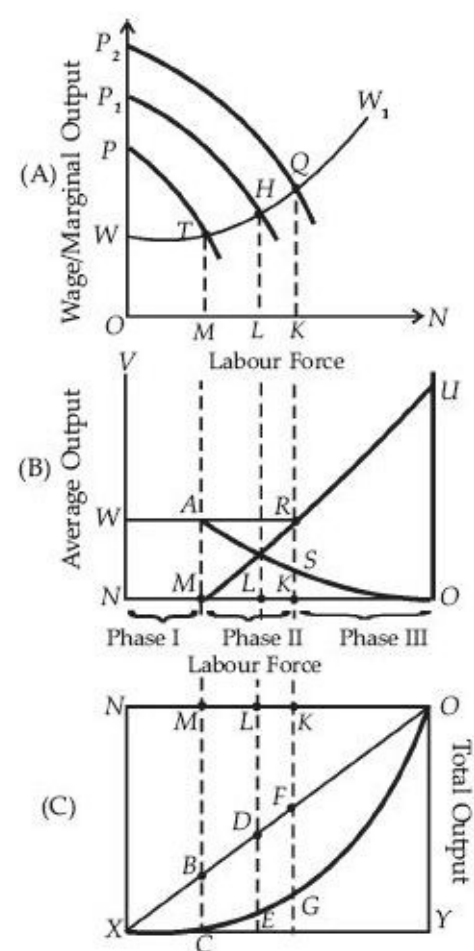


Fig. 2

<sup>3</sup>It is the inverted  $OTP$  curve Fig. 1(B)

In Phase I,  $NM$  workers are disguised unemployed. Their marginal physical productivity is zero, as shown by  $NM$  portion of the  $MPP$  curve in Panel (B) or  $CX$  portion of the  $TPP$  curve of Panel (C). This redundant labour force  $NM$  is transferred to the industrial sector shown as  $OM$  in Panel (A) at the same institutional wage  $OW (=NW)$ .

In Phase II, the MPP of agricultural workers  $MK$  is positive in the range  $MR$  on the MPP curve  $NMRU$  but is less than the institutional wage  $KR (=NW)$  they get, as shown in Panel (B). So they are also disguised unemployed to some extent and are shifted to the industrial sector. But the nominal wage in the industrial sector will not equal the institutional wage in this phase. This is because agricultural output declines with the transfer of labour to the industrial sector. As a result, there is a shortage of agricultural commodities leading to rise in their prices relative to industrial goods. This leads to the worsening of the terms for the industrial sector, thereby requiring a rise in the nominal wage in the industrial sector. The nominal wage rises above the institutional wage  $OW$  to  $LH$  and  $KQ$ . This is shown by the upward movement of the supply curve of labour from  $WTW$  from  $T$  upward is “the Lewis turning point.”

When Phase III begins, agricultural workers start producing agricultural output equal to the institutional wage and ultimately more than the institutional wage they get. This marks the end of the take-off and the beginning of the self-sustained growth. This is shown by the rising portion  $RU$  of the MPP curve in Panel (B) which is higher than the institutional wage  $KR (=NW)$ . Consequently,  $KO$  of labour will be shifted from the agricultural sector to the industrial sector at a rising nominal wage above  $KQ$  in Panel (A) of the figure. This leads to the exhaustion of the surplus labour in the agricultural sector which becomes fully commercialised. According to Fei and Ranis, “The ‘exhaustion of the labour surplus’ must be interpreted

primarily as a market phenomenon rather than as a physical shortage of manpower, it is indicated by an increase in the real wage at the source of supply.”

Fei and Ranis point out that as agricultural workers are shifted to the industrial sector, there begins a surplus of agricultural commodities. This leads to the total agricultural surplus (or TAS) in the agricultural sector. The excess portion of total agricultural output over the consumption requirement of the agricultural labour force at the institutional wage is the TAS. The amount of TAS is a function of the number of workers shifted to the industrial sector in each phase of the development process. The TAS is measured in Panel (C) of the figure by the vertical distance between the line  $OX$  and the  $TPP$  curve  $OCX$ . In Phase I when  $NM$  labour is transferred, the TAS is  $BC$ . In phase II, as  $ML$  and  $LK$  workers are shifted to the industrial sector,  $DE$  and  $FG$  amounts of TAS arise. “TAS may be viewed as agricultural resources released to the market through the reallocation of agricultural workers. Such resources can be shiphoned off by means of the investment activities of the landlord class and/or government tax policy and can be utilised in support of the new industrial arrivals.”

There is also the average agricultural surplus (or AAS). The AAS is the total agricultural surplus available per head to workers allocated to the industrial sector. It is as if each allocated worker carries his own subsistence bundle along with him. The AAS curve is depicted as  $WASO$  curve in Panel (B) of the figure. In Phase I, the AAS curve coincides with the institutional wage curve  $WA$ . In Phase II, when  $MK$  workers are transferred to the industrial sector, the AAS begins to fall from  $A$  to  $S$  in Panel (B) while  $TAS$  is still rising from  $BC$  to  $DE$  to  $FG$  in Panel (C).

In Phase III, AAS declines more rapidly from  $S$  to  $O$  in Panel (B) and  $TAS$  also declines as shown by the narrowing of the area from  $FG$  toward  $O$  in Panel (C) below Phase III of Panel (B). The decline in both AAS and  $TAS$  is due to the rise in MPP of agricultural workers by more than the institutional wage which ultimately leads to the transfer of the remaining surplus labour to the industrial sector.

Fei and Ranis call the boundary between Phase I and II as the “shortage point” when shortages of agricultural goods begin as indicated by the fall of the AAS (the portion  $AS$  of  $WASO$  curve) below the minimum institutional wage ( $NW$ ). And the boundary between phase II and III as the “commercialisation point” which signifies the beginning of equality between MPP and the institutional wage in agriculture. Thus the Lewis turning point coincides with the shortage point of Fei and Ranis, and the increase in the industrial wage is speeded up at the commercialisation point.

They show that if agricultural productivity is increasing, the shortage point and the commercialisation point coincide. This is because with the increase in agricultural productivity the rise in MPP enables the output to rise to the level of the institutional wage more quickly. It may be viewed as the shifting of  $MRU$  curve upward to the left in Fig. 2(B). On the other hand, the AAS increases with the increase in total physical productivity This means that the  $ASO$  curve in Fig. 2(B) shifts upward to the right. If the rise in productivity is sufficient, the  $MRU$  and  $ASO$  curves in Fig. 2(B) will so shift upward that the shortage point  $A$  and the commercialisation point  $R$  coincide and Phase II is eliminated. So far as the industrial sector is concerned, the increase in agricultural productivity has the effect of raising the industrial supply curve after the turning point. This can be viewed as the shifting of the  $WTW_1$  curve downward to the right below point  $T$  in Fig. 2(A).

According to Fei and Ranis, “The economic significance of the equality between our turning point and the

commercialisation point is that, after the turning point, the industrial supply curve of labour finally rises as we enter a world in which the agricultural sector is no longer dominated by non-market institutional forces but assumes the characteristics of a commercialised capitalist system.” In other words, the economic significance of the elimination of the second phase is that it enables the economy to move smoothly into self-sustained growth.

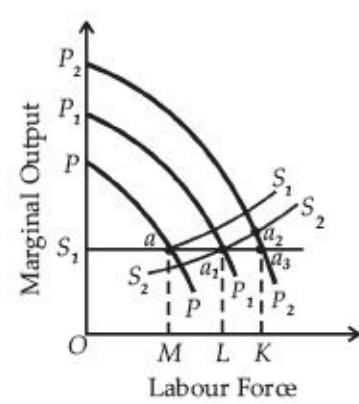


Fig. 3

**Balanced Growth.** Fei and Ranis have further shown that their model satisfies the conditions of balanced growth during the take-off process. Balanced growth requires simultaneous investment in both the agricultural and industrial sectors of the economy. This is illustrated in Fig. 3 where  $PP$  is the initial demand curve for labour and  $S_1S_1$  the initial supply curve of labour. They intersect at  $a$  where  $OM$  labour force is employed in the industrial sector. At this level of employment, the industrial sector is getting a profit equal to the area  $S_1Pa$ . This profit is the total investment fund available to the economy during the take off process. A part of this fund is allocated to the agricultural sector thereby raising agricultural productivity and shifting the supply curve of labour in the industrial sector downward to the right from  $S_1S_1$  to  $S_2S_2$ . The remaining part of the investment fund is allocated to the industrial sector, thereby shifting the industrial demand curve upward to the right, from  $PP$  to  $P_1P_1$ . The  $S_2S_2$  and  $P_1P_1$  curves intersect at  $a_1$  lying on the balanced growth path  $S_1a_3$ . At  $a_1$  the industrial sector absorbs  $ML$  labour force which has been released by the agricultural sector as a result of rise in agricultural productivity following the allocation of investment fund to it. In Fig. 3,  $ML$  labour force absorbed in the industrial sector exactly equals the labour force  $ML$  released from the agricultural sector in Fig. 2(B).

Thus as investment funds are continued to be allocated to both sectors through time, the economy will move on the balanced growth path. But there is every likelihood for the actual growth path to deviate from the balanced-growth path from time to time. “Such a deviation, however, will call into play countervailing equilibrating forces which tend to bring it back to the balanced-growth path. The actual path is, in fact, likely to be oscillating around the balanced-growth path.” For example, if as a result of overinvestment in the industrial sector, the demand curve for labour shifts to  $P_2P_2$  and intersects the supply curve of labour  $S_2S_2$  at  $a_2$ , the actual growth path will be above the balanced-growth path. This will lead to shortage of agricultural goods, to deterioration of the terms of trade of the industrial sector and to rise in the wage rate in this sector. This will discourage investment in the industrial sector and encourage investment in the agricultural sector and thereby bring the actual path to the level of the balanced-growth path  $a_3$ .

## A CRITICAL APPRAISAL

The Fei-Ranis model is an improvement over the Lewis model. The Lewis model ignores the development of agricultural sector and concentrates exclusively on the industrial sector. The Fei-Ranis model shows the interaction between the two sectors in initiating and accelerating development. Moreover, its explanation of the Lewis turning point is more realistic. But the major merit of the theory is that it shows the importance of agricultural products in capital accumulation in underdeveloped countries.

Despite these merits, the model is not free from criticism which are discussed below:

**1. Supply of Land not Fixed.** Fei and Ranis begin with the assumption that the supply of land is fixed during the development process. In the long run, the amount of land is not fixed, as the statistics of crop acreage in many Asian countries reveal. For instance, the index number of area under crops (base 1961-62) in India rose from 82 in 1950-51 to 107.3 in 1970-71.

**2. Institutional Wage not above the MPP.** The model is based on the assumption of a constant institutional wage which is above the MPP during phases I and II of the development process. There is no empirical evidence to support this assumption. In fact, in labour surplus underdeveloped countries, wages paid to the agricultural workers are much below their MPP.

**3. Institutional Wage not Constant in the Agricultural Sector.** The theory assumes that the institutional wage remains constant in the first two phases even when agricultural productivity increases. This is highly unrealistic because with a general rise in agricultural productivity, farm wages also tend to rise. For instance, the daily real wage rates (at 1966 prices) of agricultural workers for various farm operations in Punjab during the period of the green revolution (1967-72) increased by 41.7 per cent to 55.2 per cent.<sup>4</sup>

**4. Closed Model.** According Fei and Ranis, the terms of trade move against the industrial sector in the second phase when agricultural output declines and prices of agricultural commodities rise. This analysis is based on the assumption of a closed economy where foreign trade does not exist. But this assumption is unrealistic because underdeveloped countries are not close but open economies which import agricultural commodities when shortages arise.

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<sup>4</sup> M.L. Jhingan, "Surpluses Pertaining since the Green Revolution and their contribution to Industrialisation—A Study of Punjab," *IJAE*, Conference Number, July-September, 1979.

**5. Commercialisation of Agriculture Leads to Inflation.** According to the theory, when the agricultural sector enters the third phase, it becomes commercialised. But the economy is not likely to move smoothly into self-sustained growth because inflationary pressures will start. When many workers shift to the industrial sector, the agricultural sector will experience shortage of labour. In the meantime, the institutional wage also equals the MPP of workers and the shortages of agricultural products arise. All these factors will tend to create inflationary pressures within the economy.

**6. MPP not Zero.** Fei and Ranis observe that "with a fixed amount of land, there will be some size of population which is large enough to render MPP zero." But Schultz does not agree that in labour-surplus economies the MPP is zero. According to him, if it were so, the institutional wage would also be zero. The fact is that every worker receives a minimum wage, may be in kind, if not in cash. Thus it is wrong to say that the MPP is zero in the agricultural sector.

**Conclusion.** However, these limitations do not undermine the importance of the Fei-Ranis model for the economic development of labour-surplus countries. It systematically analysis the development process from the take-off to self-sustained growth, through the interaction of the agricultural and industrial sectors of an underdeveloped economy.