

THE TURNING POINT IN THE KOREAN ECONOMY

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I. INTRODUCTION

THE KOREAN economy has experienced various structural changes during its rapid growth commencing in the early 1960s. Of these, changes in the labor market are most salient. There has been a vast amount of rural-to-urban migration, and the economy has changed from an agrarian to a semi-industrialized one. The number of persons employed in the agricultural sector changed from 65.9 per cent in 1960 to 35.8 per cent in 1979, whereas that in nonagricultural establishments with ten or more workers increased from 7.1 per cent to 27.5 per cent over the same period.

The massive rural-to-urban labor migration created a modern labor market on the one hand and various new labor problems on the other. Leaving labor-management related problems aside, a major difficulty has been the increasing shortages of both skilled and unskilled workers in various fields. Thus the question may be raised whether the Korean economy has passed the Lewisian turning point or not. If the economy has passed from an unlimited to limited labor supply, this would imply the need for various policy measures qualitatively different from those based on an unlimited labor supply.

The purpose of this paper is to deal with this phenomenon, and to identify the turning point of the economy. In approach, we basically follow the established turning point theoretical framework. The conventional two-sector model will, however, be slightly modified to separately introduce the urban traditional sector. We felt this modification to be necessary because the urban traditional sector seemed too important in magnitude and too distinctive in its characteristics to be ignored. We argue later that the explicit introduction of this sector helps demarcate the "true" turning point.

We will briefly discuss the theoretical modification in Section II, where we will deal with the migration mechanism, changes in the labor market, and criteria for identification of the turning point with the urban traditional sector explicitly

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included. Our empirical findings will be presented in Section III, and concluding remarks will follow in Section IV.

II. THEORETICAL FRAMEWORK: EXPLICIT INTRODUCTION OF URBAN TRADITIONAL SECTOR

The conventional turning point theory which we basically follow in this study is the one originated and developed by Lewis [5], Ohkawa [8], Fei and Ranis [4], and Minami [7]. The essence of the theory is rather simple: The marginal productivity of labor in the traditional sector (MP_T) of a society is lower than subsistence or the institutional wage rate (IW) before the economy proceeds substantial industrialization. Unskilled labor will be supplied to the modern or capitalistic sector without affecting IW . As labor migration and improvements of technology and the terms of trade continue, MP_T will rise to reach IW . After this point labor supply is no longer unlimited and wage rates will rise as MP_T rises.

Despite the traditional versus modern or capitalistic sector division in the theory, it has been assumed in most previous empirical studies that agriculture was fully equivalent to the traditional sector. Under the two-sector approach, the labor force employed in the urban traditional sector was subsumed under the modern or capitalistic sector. The resulting "modern" or "capitalistic" sector was in fact just a nonagricultural category. Any one who left the rural area was assumed to be employed in the "modern" sector. This strong assumption was due understandably to limited data.

The appropriateness of treating the agricultural sector as equivalent to the traditional one depends crucially on the postulate that the relevant economic variables such as the marginal productivity of labor and wage rates in agriculture are equal to those in the nonagricultural traditional sector. In cases, however, where rural-to-urban migration simply transfers the underemployed in rural areas to the urban traditional (UT) sector,¹ the marginal productivity of labor in the agricultural sector (MP_A) tends to rise, while that in the urban traditional sector (MP_{UT}) tends to decline.

Taking agriculture to represent the entire traditional sector becomes more problematic where the UT sector expands to the point where it has relatively more surplus labor than the agricultural sector, and/or where the UT sector itself distinctively differ from that of the modern (M) sector. Under such circumstances, the agricultural/nonagricultural dichotomy in a turning point identification study tends to fail to draw a true picture of an economy. The agricultural turning point, in such cases, does not necessarily coincide with the turning point of the overall

¹ The urban traditional sector is referred to as the urban employment involving dominance of the subsistence principle. The size of establishments is very small and wage rates and marginal productivity are very low due to overall underemployment. Large numbers of the self-employed and family workers are a feature of this sector and odd and unstable jobs are also characteristics. Following convention, we define UT as employment in establishments with less than ten workers and the modern (M) sector as employment in establishments with ten and more workers in the urban sector. See [6] and [20].

economy. We note this since, as will be shown later, the changes in the Korean labor market has followed a pattern such as that described above.

A. *The Migration Mechanism, Changes in the Labor Market, and Reaching the Turning Point*

As mentioned earlier, we do not deviate from conventional turning point theory, except that UT is explicitly introduced in the analysis. Hence the standard predictions of the theory will be valid in this study too. We therefore limit ourselves to discussing the minimum necessary alteration of the theory to incorporate UT. As with any turning point theory, we analyze only unskilled labor excluding skilled labor from the analysis.

We assume the following:

(1) The total labor force of an economy is fixed and employed in three sectors, i.e., rural traditional (RT) or agricultural (A),² urban traditional (UT), and modern (M). The totally unemployed are excluded from the labor force and are treated as noneconomically active population. But those underemployed are included in the labor force.

(2) The number of employed in the agricultural sector (L_A) is a function of time alone, i.e., $L_A = f(t)$, where $dL_A/dt < 0$. In the modern sector, however, the number of employed (L_M) is a function of time during $MP_M \leq IW$, i.e., $L_M = g(t, IW)$, where $dL_M/dt > 0$. In the UT sector, the number of employed (L_{UT}) is also a function of time, but it is determined by the situation in both L_A and L_M . It can be either $dL_{UT}/dt > 0$ or < 0 depending on the nature of the interaction between all three sectors.

(3) In the RT and UT sectors, the subsistence principle dominates economic activities. In the M sector, however, the profit maximization principle prevails.

(4) Wage rates for the RT, UT, and M sectors stand at IW (independent of any single firm's labor demand situation and of the labor supply schedule) until the turning point is reached. IW is determined socially and is assumed, for the sake of simplicity, to be fixed over time.

(5) Migration takes place from the traditional to the modern sector (i.e., A to UT, A to M, and UT to M), for various reasons ranging from higher income expectations to the push-out effects of rural living.³ Some migrants get jobs in M directly, but others find their livings in UT.

Let us now examine the levels of MP_A and MP_{UT} , and the factors affecting them, beginning with MP_A .

MP_A is usually very low in the initial period in densely populated agrarian societies. However, as an economic spurt proceeds, MP_A begins to rise due to the following favorable factors: (1) Out-migration to urban areas; (2) Techno-

² The rural traditional sector consists of agriculture and rural-based nonagricultural activities in establishments with less than ten workers. Since there is little economic information on the latter establishments and their relative importance is small, the agricultural sector will represent the rural traditional sector as a whole.

³ On the pushing factor, see the "neo-enclosure" hypothesis of Y. Torii and Y. Tsumita [21, pp. 37-40].

logical improvements in management, mechanization, seed varieties, fertilizers, pesticides, and herbicides, etc.; and (3) Improvement of the terms of trade against nonfarm commodities.

When these three factors are viewed over time as elements of economic growth, it may readily be seen that all three correlate positively with MP_A . Thus, we can expect MP_A to increase unmistakably and uninterruptedly as economic growth proceeds.

The level of MP_{UT} must also be quite low in the initial period because of the very nature of jobs in this sector which involves odd, unstable, and marginal economic activities. The subsistence principle which also underlines this sector pushes people to creating as many jobs as possible. People can easily start new economic activities as street venders, hookers, or peddlers, since economic activities in the sector are free of the land pressures connected with subsistence farming. Therefore, MP_{UT} may be expected to remain relatively low in the earlier states of the economic spurt.

Factors affecting MP_{UT} over time can be listed as follows:

(1) Net changes in labor force deriving from in- and out-migration of the sector. If net migration is negative (i.e., out-migration is less than in-migration for UT), then the labor force will increase and this will most likely lower MP_{UT} .

(2) Improvement in any aspect of related technology will raise MP_{UT} .

(3) Structural changes in the sector's labor market, such as the drastic influx of female workers in the later period, will also cause changes in MP_{UT} . The change cited will cause the lowering MP_{UT} .

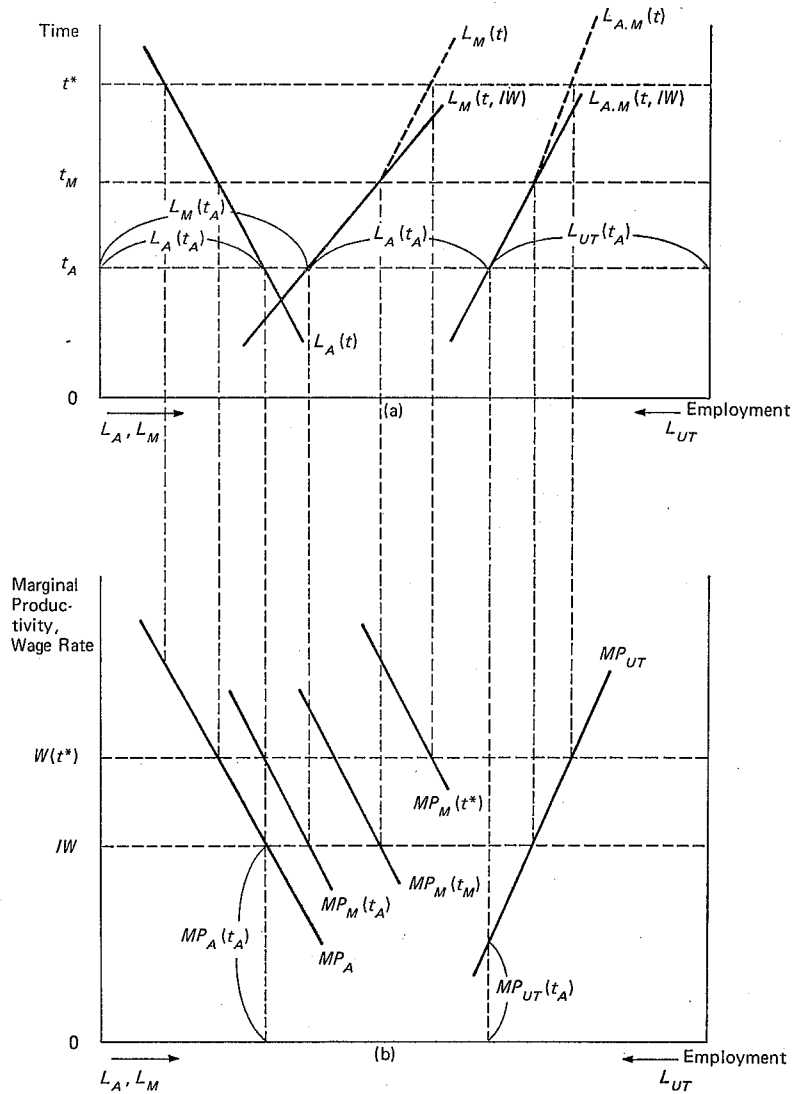
(4) Changes in terms of trade for the goods and services of this sector will affect MP_{UT} too. Of course, the terms of trade seems to be very unfavorable to UT in the earlier period. But as the demand for goods and services increases due to increases in income, the terms of trade in this sector will also gradually improve. This will inevitably raise MP_{UT} .

Looking at the changes in these four factors over time we can see that not all of them are consistent with increases in MP_{UT} . The first and third factors are likely to have a rather unfavorable influence on MP_{UT} . Whether these retarding factors really matter or not is an empirical question. Nevertheless, the observation that relative size of UT has increased in many countries compared to RT implies a tendency of MP_{UT} to remain low or at least rise more slowly than MP_A .

We do not feel that the detailed analysis of the M sector is necessary here. It is enough to note that somehow the M sector must be expanded as quickly as possible if a society is to reach the turning point within a conceivable span of time.

Now let us turn to the relationship among labor force and MP s in the three sectors and to the wage rate (W). Figure 1(a) and (b) illustrate the relationship hypothetically. In Figure 1(a), $L_M(t, IW)$ increases with time, reflecting the economic spurt in the M sector. $L_A(t)$ decreases over time. The curve $L_{A.M}(t, IW)$ reflects the sum of L_A and L_M , and shows employment in the UT sector (L_{UT}) as a residual. Figure 1(b) illustrates the marginal productivities of the A, M, and UT sectors and W . Under the initial condition, MP_A is substantially lower than

Fig. 1. Relationships between Employment, Wage Rates, and Marginal Productivity



IW. MP_A increases with time. It reaches the level of *IW* at t_A which demarcates the “agricultural” turning point. Since the labor demand schedule of the M sector is MP_M and in equilibrium $L_M(t)$ and $MP_M(t)$ have a one-to-one relationship, we can see that $L_M(t_A)$ is the counterpart of $MP_M(t_A)$. It should be noted that MP_{UT} is set lower than *IW* at t_A ; in other words, $MP_A(t_A)$ is higher than $MP_{UT}(t_A)$ in this illustration to reflect the discussion above.

If surplus labor is accumulated more in the UT than the A sector, or the UT sector is much more depressed than the rural area, the gap between MP_A and MP_{UT} could be wide. The UT sector might harbor a pool of the underemployed and be capable of supplying many unskilled workers. When MP_{UT} reaches *IW*

through further economic growth, MP_A will already be higher than IW . In the figure this occurs at t_M . The point t_M has special economic meaning because there will be no unlimited labor supply for the M sector to draw on thereafter. The point t_M must, therefore, be called the turning point for the economy as a whole.

Once MP_{UT} reaches IW , more labor can be attracted only through raising wage rates. This is because the conditions which give rise to unlimited labor supply (without an accompanying wage increase) disappear after t_M . It is important to note that the time interval between t_A and t_M could be substantial, i.e., the turning point for an economy could be reached some time later than the "agricultural" turning point. In addition, the figure reveals that if the agricultural sector alone is examined to identify the turning point, the higher wage level will be predicted to prevail after the agricultural turning point is passed.

As demand for labor in the M sector continues to increase after t_M is reached, the wage rate paid will start to rise. This is illustrated for one point in time, namely t^* , in Figure 1(b), with the wage rate shown as $W(t^*)$. The force behind this wage rise is of course the rising marginal productivity of the UT sector. The dotted lines $L_M(t)$ and $L_{A,M}(t)$ depict the labor force in M and in A and M together under the influence of the raised wage rate after t_M .

B. *Criteria for Identifying the Turning Point*

So far we have argued that the UT sector, depending on the country concerned, can have distinctive features differing from both the RT and M sectors. The criteria for identifying the turning point should be modified accordingly where the UT sector is explicitly introduced.

Before we discuss our criteria, it may be proper to refer to the possible criteria implied by the conventional theory. Of the conventional theorists, Minami developed identification criteria most extensively. He presented five criteria: (1) comparison between wages and the marginal productivity of labor in the subsistence sector, (2) correlation between wages and the marginal productivity of labor in the subsistence sector, (3) movements in real wages in the subsistence sector, (4) changes in wage differential, and (5) the elasticity of labor supply from the subsistence sector to the capitalistic sector [7, pp. 72-83].

The first criterion concerns identification of the turning point in the agricultural sector. In order to identify the agricultural turning point we can examine: (1) changes in the marginal productivity of labor and wage rates in the sector, (2) changes in the product elasticity of labor and in the labor income share, and (3) changes in the terms of trade for agriculture.

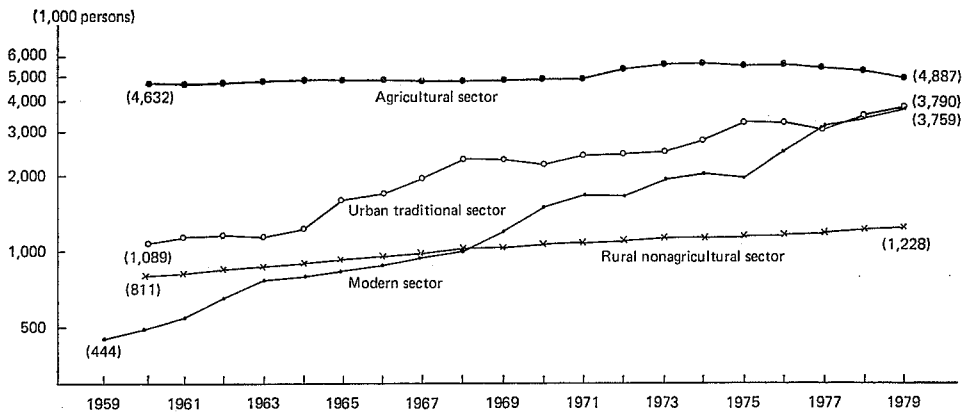
The second and modified criterion is that only those persons actually supplied to the M sector should be considered in the computation of supply elasticity of labor. Previously this point was not given proper consideration in empirical studies. We argue that labor supply elasticity computed solely on the basis of the rate of change in the outmigrating labor force from the rural area does not adequately mirror the basic proposition of the theory. The figures so derived will have biases stemming from two sources. The first is that it ignores migration to UT. The other is that it cannot reflect the labor supply of UT to M.

TABLE I
NUMBER OF PERSONS EMPLOYED IN RURAL TRADITIONAL,
MODERN, AND URBAN TRADITIONAL SECTORS (1,000; %)

Year	Number of Persons Employed (Total) (1)	Rural Traditional Sector		Modern Sector (4)	Urban Traditional Sector (5) = (1) - [(2) + (4)]
		Total (2)	Agriculture (3)		
1960	7,028(100.0)	5,443(77.4)	4,632(65.9)	496(7.1)	1,089(15.5)
1965	8,206(100.0)	5,745(70.0)	4,810(58.6)	832(10.1)	1,629(19.9)
1970	9,745(100.0)	5,984(61.4)	4,916(50.4)	1,494(15.3)	2,267(23.3)
1975	11,830(100.0)	6,579(55.6)	5,425(45.9)	1,970(16.7)	3,281(27.7)
1979	13,664(100.0)	6,115(44.8)	4,887(35.8)	3,759(27.5)	3,790(27.7)

Sources: Columns (1) and (3) from [13]; column (2) from [13], and [16] for rural based nonagricultural activities; column (4) from [11], and [14] for civil service and public teachers.

Fig. 2. Number of Persons Employed in Agricultural, Modern, and Urban Traditional Sectors



Source: Same as Table I.

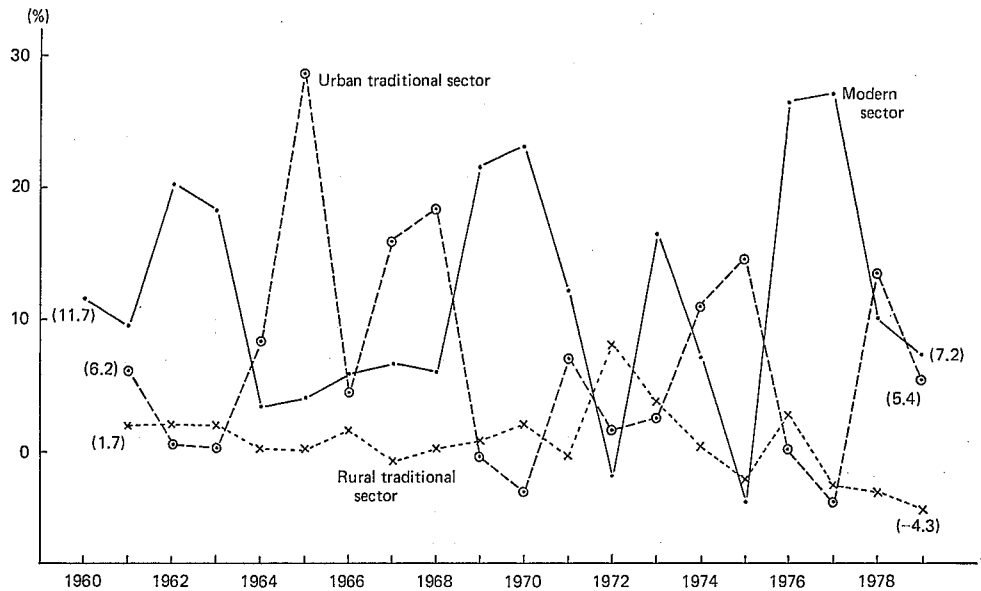
In addition, the modified theoretical framework makes it possible to compare wage rates and *MPs* among the RT, UT, and M sectors. From these comparisons we can draw richer information helpful in identification of the turning point. To the extent that the UT sector is large and has distinctive features, the modified framework will more correctly identify the turning point. In addition to these criteria, we will add changes in wage differentials for various categories, labor income share, and the job opening/applicant ratio.

III. EMPIRICAL FINDINGS

A. The Urban Traditional Sector

Before we present the results of empirical work on the turning point of the Korean economy, the magnitude and characteristics of Korea's UT sector will be briefly discussed. Table I and Figure 2 exhibit the magnitudes of the RT,

Fig. 3. Rates of Growth of Employment in Rural Traditional, Modern, and Urban Traditional Sectors



Source: Same as Table I.

UT, and M sectors. The first to note in this figure is that the UT sector in Korea has expanded quite rapidly in the course of economic growth. The percentage of total labor force in the sector has increased from 15.5 per cent (1960) to 23.3 per cent (1970), then 27.7 per cent (1979). Until very recently, much more of the labor force has been engaged in UT than in M. The average rates of growth of the labor force in total economy and in RT, UT, and M during the period 1960–79 are 3.56 per cent, 0.61 per cent (the rate of the agricultural sector alone was 0.28 per cent), 6.78 per cent, and 11.25 per cent, respectively. The rate of growth of UT was much higher than that of the total labor force. Since migration occurs mostly from RT to M, from RT to UT, and from UT to M, UT has experienced a net increase in the number of persons supplied by RT after taking mobility toward M into account.⁴

The second thing to note is that Figure 3 shows that the changes in the size of UT have their own pattern, distinct from both the RT and M sectors. Since the relative size of the RT or A sector is decreasing steadily, the UT sector, as a surplus labor pool including people migrated from rural areas, has expanded or contracted in relation to downswings or upswings in M.

The third thing to note is that the wage rate in UT seems to be systematically lower than that in the M sector. The average wage rate in UT manufacturing firms with five to nine persons has been about 20 per cent less in the 1970s than

⁴ Although we do not know the ratio between migration from RT to UT and from RT to M, it should be safe to assume that many rural-to-urban migrants obtained incomes from UT.

that in textile manufacturing firms with ten persons or more, which comprises one of the lowest wage-rate industries in M. These three phenomena strongly support our argument that UT should be dealt with separately from the RT and M sectors.

B. *Identification of the Turning Point in Agriculture*

1. *Changes in marginal productivity of labor and wage rate in agriculture*

In order to estimate the marginal productivity of labor, we assume the usual Cobb-Douglas production function for this sector, namely,

$$X = AK^\alpha L^\beta,$$

or

$$\ln X = \ln A + \alpha \ln K + \beta \ln L, \quad (1)$$

where K and L refer to capital and labor, respectively. The data used for the estimate are pooled from time series and cross-sectional data. The farm household economic survey of Korea gives annual information on five observations by farm size. Regressions were run on the data of four to five years with twenty to twenty-five observations because the main object of the procedures is to capture the change in *MP* over time.⁵ The results of the estimate of regression coefficients are presented in Table II. The marginal productivity of labor based on the coefficients (the product elasticity of labor) and the changes in the real wage rate of agriculture (daily rate for male) are given in Figure 4. The figure shows that the agricultural turning point occurred around 1969.⁶

2. *Product elasticity of labor and labor income share in agriculture*

Figure 5 displays similar results obtained by coming at the analysis from a slightly different angle. The changing levels of product elasticity in agriculture were compared with changes in the labor income share of the sector. The dotted line is the outcome of connecting four product elasticities for four periods of four to five years each. The figure reveals two things. First, the labor share was higher than the product elasticity until the early 1970s. Second, the labor share decreased from 1968, but reached its nadir in 1975 and has increased since. We will examine these two phenomena a little further.

Let us start with the first. From the theoretical view point, it is noted that in equilibrium product elasticity is equal to labor share for a profit maximizing firm, because the marginal productivity of labor is equal to the wage rate in equilibrium. For example, let the production function be

$$X = f(K, L). \quad (2)$$

⁵ For this reason we strongly believe that some empirical studies which estimated only one product elasticity over quite a long period could have upward bias in the early and downward bias in the later period, possibly resulting in locating the turning point somewhat incorrectly.

⁶ It is interesting to note that the absolute numbers of agricultural population and of farm households started to decrease from 1967. However, the absolute size of the agricultural labor force started to decline only after 1976.

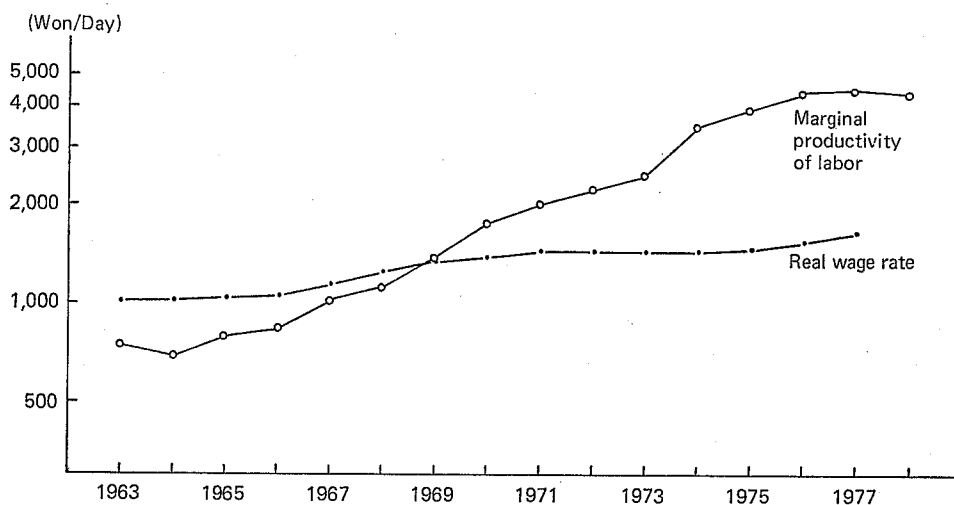
TABLE II
REGRESSION COEFFICIENTS OF AGRICULTURAL PRODUCTION FUNCTION

Period	α	β	Constant Term	R^2
1962-68	0.608 (6.04)	0.351 (2.33)	2.449 (3.57)	0.96
1966-69	0.548 (3.94)	0.524 (2.96)	2.401 (2.22)	0.98
1970-74	0.446 (7.73)	0.806 (11.98)	2.432 (3.76)	0.97
1975-79	0.133 (1.73)	1.112 (11.83)	5.622 (7.83)	0.99

Source: [18].

- Notes: 1. The first period (1962-68) was extended to give statistically significant results.
2. Fixed capital includes land and other fixed assets. Land was not separately introduced as an input because of the multicollinearity problem.
3. Labor input is in terms of working days per year.
4. Figures in parentheses are t -values.

Fig. 4. Marginal Productivity of Labor and Real Wage Rate in Agriculture (Three-Year Moving Average at 1975 Constant Prices)



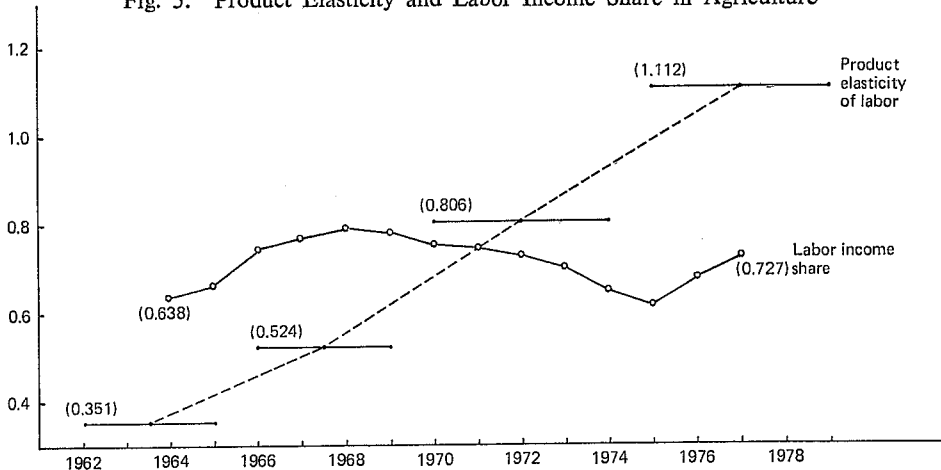
Source: [18].

Note: 1975 constant price was calculated by averaging indices of prices paid to and prices paid by farm households.

Then product elasticity of labor (β) is $(\partial X/\partial L) \cdot (L/X)$ and labor share (γ) is WL/X . Since $\partial X/\partial L = W$ in equilibrium, $\beta = \gamma$.

Turning point theory predicts that the agricultural sector tends to be subject to the profit maximization principle after passing the turning point. The commercialization point of Fei and Ranis is an expression of this [3, p. 540]. Hence, we can expect the gap between the product elasticity and the labor share to

Fig. 5. Product Elasticity and Labor Income Share in Agriculture



Sources: [18] for product elasticity of labor; [2], [13], and [18] for labor income share in agriculture.

Note: Labor income share is based on the author's estimates.

become narrower as the agricultural sector approaches the turning point. Figure 5, which shows the relationship of the changes in these two variables in accordance with this theoretical prediction, indicates the agricultural turning point to have been passed in the early 1970s. Of course, this is only a very crude indicator for turning point identification.

Now let us turn to the second phenomenon. Labor income share changes in response to various factors. It can be represented as follows:

$$\gamma = \frac{WL}{PX}, \quad (3)$$

where

- γ : labor income share,
- W : wage rates,
- L : labor employed in the A sector,
- P : relative prices of farm products,
- X : output.

This can be rewritten in the form of rates of change

$$\frac{\dot{\gamma}}{\gamma} = \frac{\dot{W}}{W} + \frac{\dot{L}}{L} - \frac{\dot{P}}{P} - \frac{\dot{X}}{X}, \quad (4)$$

or

$$= \left[\frac{\dot{W}}{W} - \frac{\dot{P}}{P} \right] + \left[\frac{\dot{L}}{L} - \frac{\dot{X}}{X} \right]. \quad (5)$$

The rate of change in labor income share (γ) depends primarily on the four different economic variables shown in (3). According to (5), if the rate of change in the gap between labor and output remains constant, γ will be increasing when

Fig. 6. Changes in Parity Ratio of Farm Households (Three-Year Moving Average at 1975 Constant Prices)



Source: [19].

Note: Parity ratio = (prices paid to farm households / prices paid by farm households) \times 100.

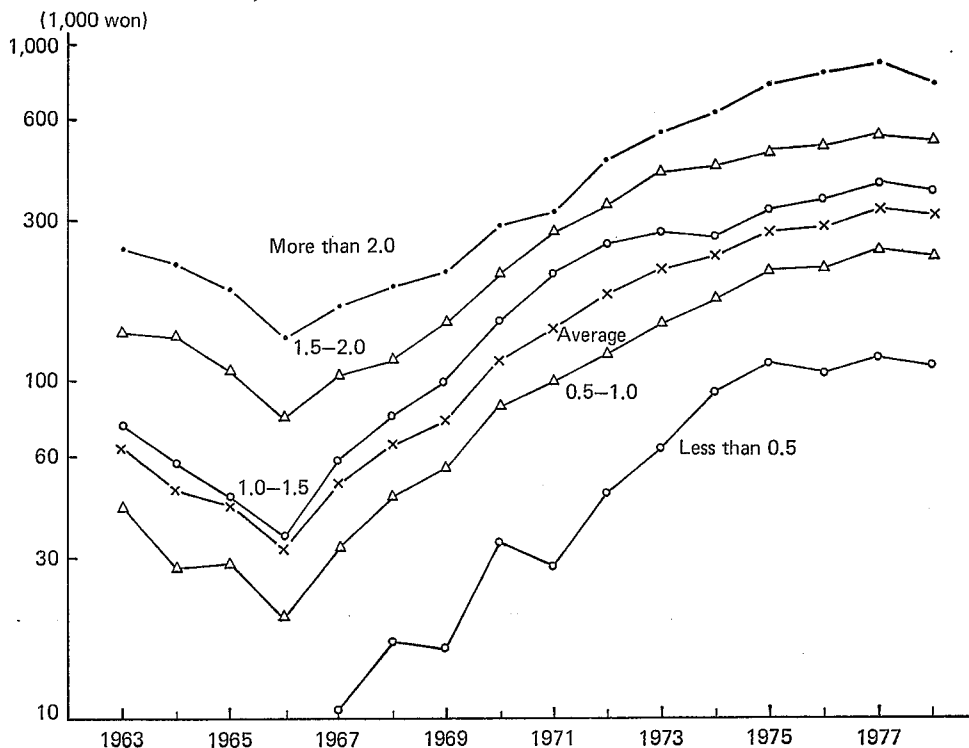
the overall value of the first bracket on the right hand side is positive, but γ will be decreasing when its value is negative. If we assume that changes in L and X are less than those in W and P , then we may expect the following. The declining agricultural labor share in the period 1968–75 and the reverse trend thereafter indicates that the rate of change in price (\dot{P}/P) has been dominant during the first period and that in wage (\dot{W}/W) has been dominant since 1975.

Figure 6 demonstrates that the changes in parity ratio of farm households started to rise from 1966 and reached a peak in 1974. In other words, the terms of trade for farm households drastically improved during the period 1966–74 and then declined slightly thereafter. This phenomenon is further evidence that the agricultural turning point was passed during the latter half of the 1960s. It is consistent with the theoretical proposition deduced from (5).

One may be puzzled by the fact that the agricultural wage rates did not rise sharply during the second half of the 1960s in keeping with the drastic improvement of the terms of trade for the sector. The puzzle may be resolved, when we consider the agricultural turning point separately from the turning point for the economy as a whole.

It will be recalled that there can be substantial amounts of surplus labor in UT even after the agricultural sector reaches its turning point. If this is the case, the growth rate of the agricultural real wage may not increase rapidly until the true turning point is reached since there will be some downward pressure on agricultural wages from urban surplus labor. The sharp increase in both wage

Fig. 7. Changes in Economic Surplus by Farm Size (Three-Year Moving Average at 1975 Constant Prices)



Source: [18].

Note: The numbers in the figure denote farm size in *jeongbo* (=0.9918 ha).

rate and labor share in the agricultural sector after 1975 may be interpreted as evidence for the true turning point of the society as a whole.

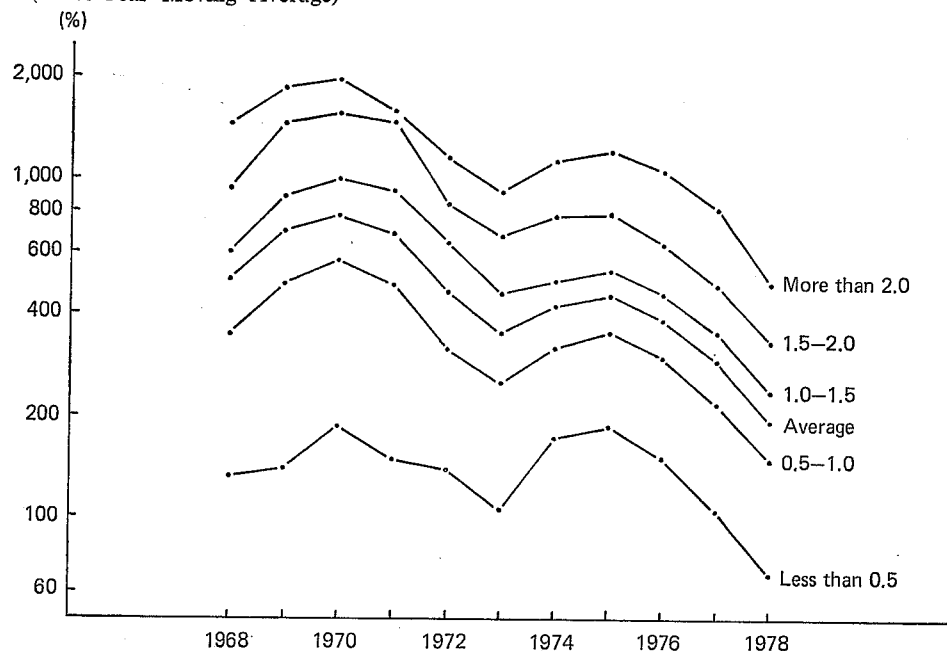
3. Pull and push effects of rural-urban migration

Let us now examine one piece of evidence that the pull effect has been stronger than the push effect in spurring rural-urban migration in Korea. During the 1960s and 1970s, as is shown in Figure 7, the absolute level of the economic surplus of farm households of every farm size group steadily increased in real terms.

However, when the economic surplus of farm households is compared to that of urban wage (excluding salary) workers, the ratio declined rapidly as is shown in Figure 8. Two points can be noted. First, the economic surplus of the urban wage earners has been very low: only one-fifth of that of average farm households in 1968. Second, the difference has narrowed sharply. It grew to about a half in 1978 (53.2 per cent), and drew about equal in 1979 (93.5 per cent). This change might have lured many rural underemployed to urban areas, resulting in expansion of the UT sector. If the pull effect has been stronger than the push effect, this together with the low earnings of urban wage workers would suggest the possibility of a substantial accumulation of underemployed in UT.

The evidence so far examined strongly suggests that the agricultural turning

Fig. 8. Economic Surplus Ratio of Farm Households versus Urban Wage Earners (Three-Year Moving Average)



Sources: [17] and [18].

Notes: 1. The numbers in the figure denote farm size in *jeongbo* (=0.9918 ha).

2. Ratio=(economic surplus of farm households/economic surplus of urban wage earners) \times 100.

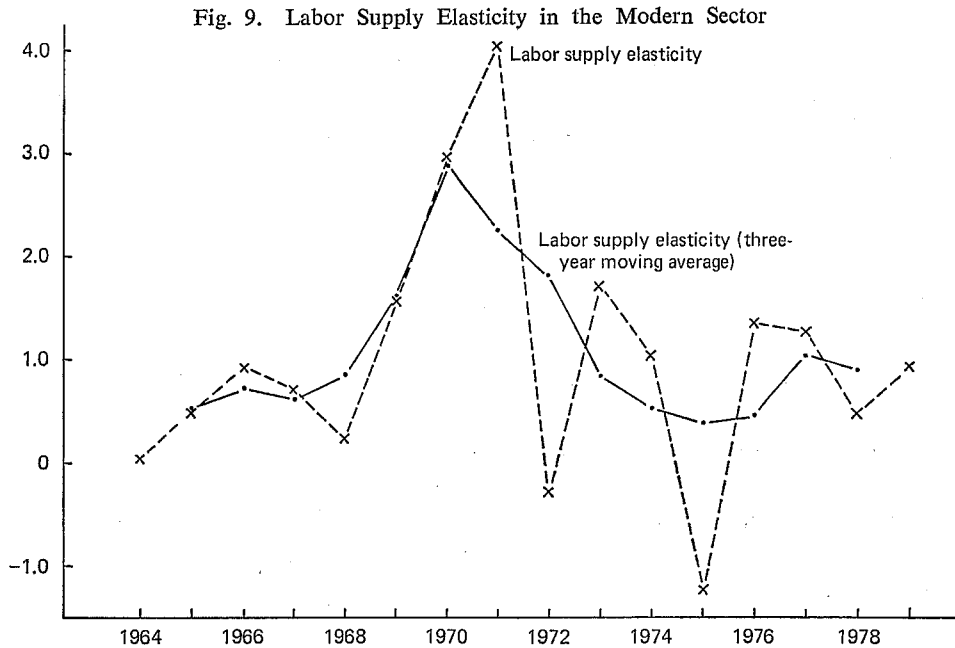
point in Korea occurred in the latter half of the 1960s. We have argued, moreover, that this turning point in the agricultural sector could have been earlier than the true turning point for the whole society.

C. Labor Supply Elasticity in the Modern Sector

One of the points argued in the previous section concerning the criteria for identifying the turning point was that labor supply elasticity should be computed for the modern sector only. In other words, people employed in the UT sector should not be treated like those in the M sector because UT is also an important labor supply source for the modern sector (along with RT).

Data concerning the number of unskilled persons supplied to the M sector and the wage rate of the unskilled in the M sector would be most desirable. Unfortunately the first data are not available, so we are forced to use the total employed in M and nonfarm unemployment.⁷ This may not be supportable theoretically because skilled workers are included. However, considering the fact that the industrialization of Korea has been export-led and that many industries which produce export goods employ mostly unskilled or semi-skilled workers, these

⁷ It is assumed that half of the nonfarm unemployed are looking for jobs in the modern sector. Hence unemployment is introduced into the empirical study to that extent.



Sources: Data for number of persons employed in the modern sector are the same as Table I; [13] for urban unemployment; wage rates are derived from Republic of Korea, Administration of Labor Affairs, *Report on Monthly Labor Statistics Survey* (various issues).

Note: It is assumed that half of the urban unemployed are looking for jobs in the modern sector.

data perhaps capture the relationship between labor supply and wage accurately enough for our purpose. The results are shown in Figure 9. Labor supply elasticity was high during the period 1969–72, but declined thereafter, reaching its lowest point in 1975. It fluctuates a good deal and it may be too early to say that it will decline continuously. But if we confine our observations to the period after 1969, there certainly seems to be a declining trend. It may be true that this reflects some cyclical effects, but elasticity did not rise very much even during the peak years of 1976–78.

Turning point theory implies that the elasticity of labor supply will decrease as an economy reaches its turning point due to the fact that a much higher rate of change in wage rates will be required to secure a given rate of change in labor supply. This is precisely the meaning of the so-called limited labor supply. We can observe in Figure 9 that elasticity started to decrease from the early 1970s and reached its trough in 1975. If we had the relevant data for unskilled labor only, we might see the decline starting a little later, because skilled labor shortages are much more marked than unskilled. For this reason, we are inclined to believe that the turning point for the unskilled occurred around the middle of the 1970s.

TABLE III
CHANGES IN WAGE RATES FOR SKILLED AND UNSKILLED WORKERS

Sector		(%)		
Year	Machinery	Textile	Wearing Apparel	
1958-66	-0.3	1.3	-4.1	
1967-70	2.9	7.8	10.8	
1971-74	10.7	10.6	10.1	
1975-78	19.5	13.8	18.5	

Source: [15].

D. *Changes in Wage Differentials*

1. *Skill wage differentials and changes in wages for the unskilled*

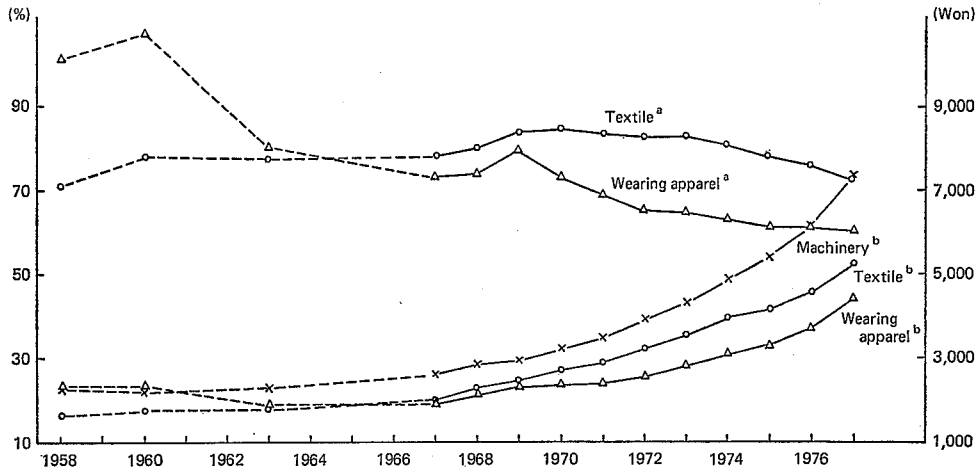
When an economy reaches its turning point, surplus labor tends to be exhausted, resulting in a rising wage rate for unskilled workers. Thus, other things being equal, theory predicts that skill wage differentials will become narrower. If, however, other things are not equal, the prediction does not necessarily hold.

It seems that other things were not equal in Korea during the 1970s. As shown in Table III and Figure 10, the wage rates for the textile and wearing apparel industries, which employ mostly unskilled have risen during the 1970s (especially during the period 1975-78), though those of the machinery industry, which represents skilled workers, have risen more rapidly. There is no discernible difference between the growth rates for skilled and unskilled in the period 1971-74. The wage rates of the unskilled rose more than 10 per cent per annum in real terms. And during the period 1975-78, they even accelerated (the average growth rates for real wages in the textile and apparel industries were 13.8 per cent and 18.5 per cent, respectively), but the wage differentials widened because of the even more rapidly rising wage rate for the skilled (19.5 per cent per annum between 1975-78).

Thus, the exhaustion of surplus labor is indicated by the rapidly rising wage rates of the unskilled in this period even though skill wage differentials widened. The widening of wage differentials has occurred, we can argue, because the Korean economy has experienced shortages of both skilled and unskilled at the same time, with more severe shortages of the former in this period.⁸ It should be emphasized that the rates of growth of unskilled wage rates have risen sharply since 1975.

⁸ There are various reasons for this intensified labor shortage during the period. First, the period witnessed unprecedented boom years, with the demand for highly-educated workers increasing dramatically. Second, the government launched a program of drastic investment in heavy industries which raised unusual demands for the skilled. Third, enrollment in higher education had been too tightly controlled, with the ratio of success of high school graduates wishing to enter colleges or universities dropping from about 50 per cent in 1950s to 32.3 per cent in 1965 and 25.8 per cent in 1978. There was a drastic increase in the ratio after 1979. Fourth, the outflow of labor to the Middle East in this period must have contributed to the shortage too.

Fig. 10. Changes in Wage Rates and Wage Differentials between Skilled and Unskilled Workers



Source: [15].

^a Wage differential = (wage rates in the industry indicated / wage rates in the machinery industry) × 100.

^b Average wage rates per day in won for the workers employed in the industry indicated.

TABLE IV
CHANGES IN WAGE RATES BETWEEN PRODUCTION AND PROFESSIONAL,
TECHNICAL, AND MANAGERIAL WORKERS (%)

Year	Production Workers	Professional, Technical, and Managerial Workers
1965-70	12.8	6.6
1971-74	7.1	6.1
1975-79	16.8	15.3

Source: [10].

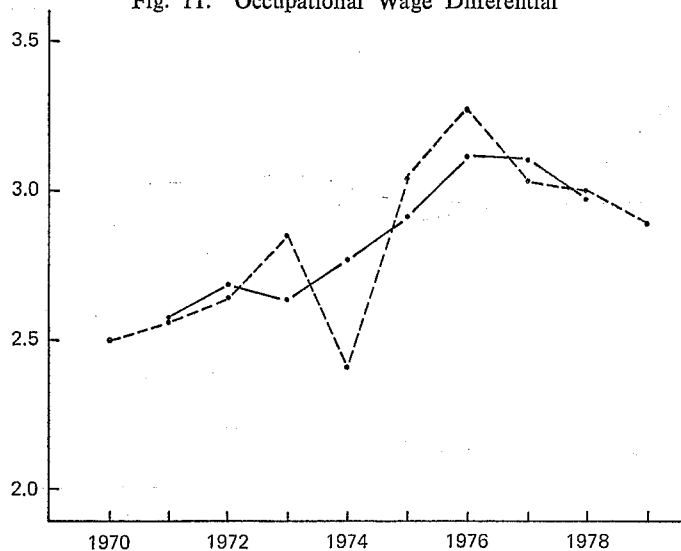
The skill wage differentials and the changes in unskilled wage rates imply that there has been a distinctive structural change in the Korean labor market in the middle of the 1970s.

2. Occupational wage differentials

Another way of looking at skill wage differentials is to examine the changes in wage relationships between high-skill occupations like professional, technical, and managerial ones and production workers. Data availability limitations forced us in the previous section to compare wages of the skilled and the unskilled in only certain manufacturing industries. The occupational wage differential concept, however, involve workers in a wider range of industries. It must capture overall relative changes in wage rates between the skilled and unskilled, and the "unskilled" category represented here by "production workers" might be slightly different from the unskilled we have been discussing.

Table IV and Figure 11 clearly show that the wage differential had been rising

Fig. 11. Occupational Wage Differential



Source: [10].

- Notes: 1. Occupational wage differentials are the ratios of wages of professional, technical, and managerial workers to those of production workers.
 2. The dotted line refers to the occupational wage differential and the heavy line refers to the three-year moving average.

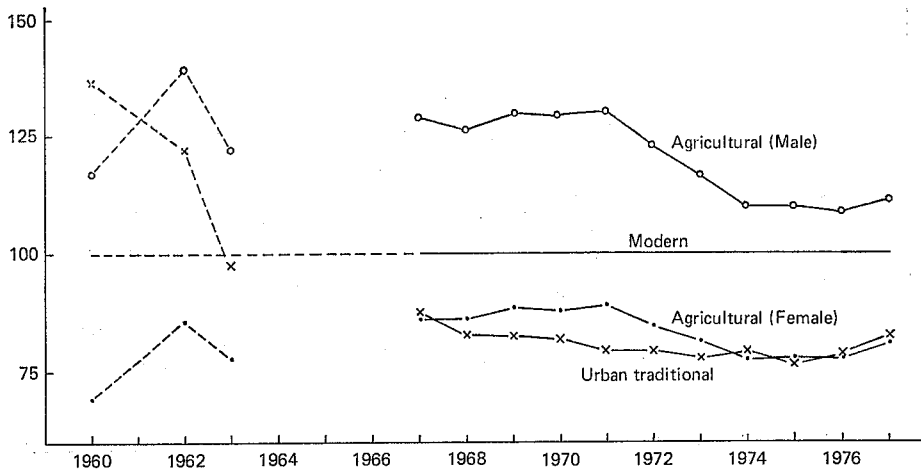
until around 1975, and then declined steadily thereafter. During the period 1975–79, the annual average growth rate of real wages for professional, technical, and managerial workers was 15.3 per cent, revealing a shortage of workers in these categories. The annual average growth rate of real wage for production workers for the same period, however, was even higher, namely, 16.8 per cent (compared to 7.1 per cent during the 1970–74 period). This phenomenon seems to indicate that the Korean economy passed its turning point around 1975.

3. *Wage differentials between modern unskilled, urban traditional, and agricultural workers*

Turning point theory predicts that a subsistence or institutional wage rate for the unskilled will prevail in any sector as long as the unlimited labor supply condition exists. At the empirical level, however, we observe wage levels differing according to sector. There may be many reasons for this, both economic and noneconomic. As Mazumdar pointed out, profit maximizing management may not set wages at the lowest level possible. It could set wages so as to minimize the wage cost per unit of effort supplied.⁹ The economic judgement involved could then be slightly different by sector. In addition, there could be noneconomic factors such as discrimination on the basis of sex, age, etc., coupled with various irrational reasons.

⁹ See [6, p. 656].

Fig. 12. Wage Differentials between Modern, Urban Traditional, and Agricultural Sectors (Three-Year Moving Average, Modern Sector=100)



Sources: [15] for textile and manufacturing (five to nine workers); and [18] for agricultural wage rates.

Wage differentials based on these factors will diminish as a society experiences a shift from unlimited to limited labor supply. The explicit introduction of the UT sector (as described in Section II above) also suggests a possible variation in wage level within the "traditional" sector. We present wage differentials between modern unskilled, urban traditional, and agricultural workers in Figure 12. The wage rate of workers in textile enterprises employing ten or more workers represents the modern unskilled, while that of all manufacturing firms with five to nine workers is taken as the UT sector wage rate for want of better data.

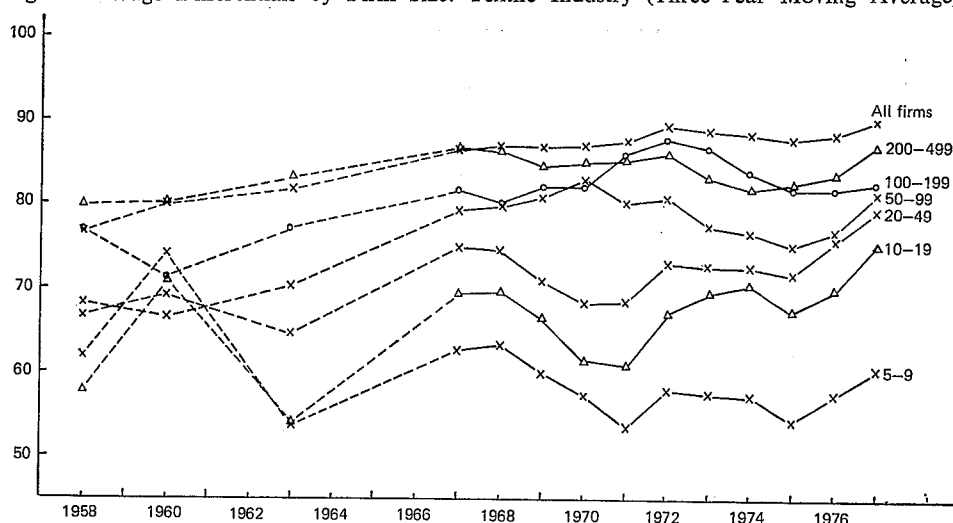
What we would expect is that the wage differentials between these sectors will be narrowing as the economy reaches the turning point. Wage differentials are shown as percentages of the wage rate of a given sector against that of the modern sector (=100). It can be seen that the wage differential between agricultural male and modern sector certainly starts narrowing from the early 1970s. The differential has narrowed from about 30 per cent prior to 1971 to about 10 per cent after 1974.¹⁰ The other two differentials, between the UT and M sectors and between agricultural female and the M sector exhibit different patterns. They widened up to around 1975, and then steadily narrowed thereafter. These wage differentials also seem to suggest a turning point for the economy somewhere in the middle of the 1970s, although they are crude indicators.

4. Wage differentials by firm size

Strictly speaking, turning point theory implies no wage differentials between

¹⁰ The narrowing wage differential is not necessarily inconsistent with the agricultural turning point because only the relative levels were depicted here, and they do not preclude rising agricultural wage rate in absolute terms.

Fig. 13. Wage Differentials by Firm Size: Textile Industry (Three-Year Moving Average)



Source: [15].

Note: The figures on the right side of each lines indicate firm size classified by the number of employees.

unskilled workers of different sized firms. At the empirical level, however, the management of larger firms might have more discretion on wages for the unskilled, due to higher productivity. Therefore, we might expect slightly higher wage rates to prevail in larger firms than in the smaller ones. We may say that the larger firms pay slightly higher wages than the institutional wage rate, while the smaller ones pay somewhat lower wages under conditions of labor abundance. This sort of gap will diminish as an economy reaches its turning point.

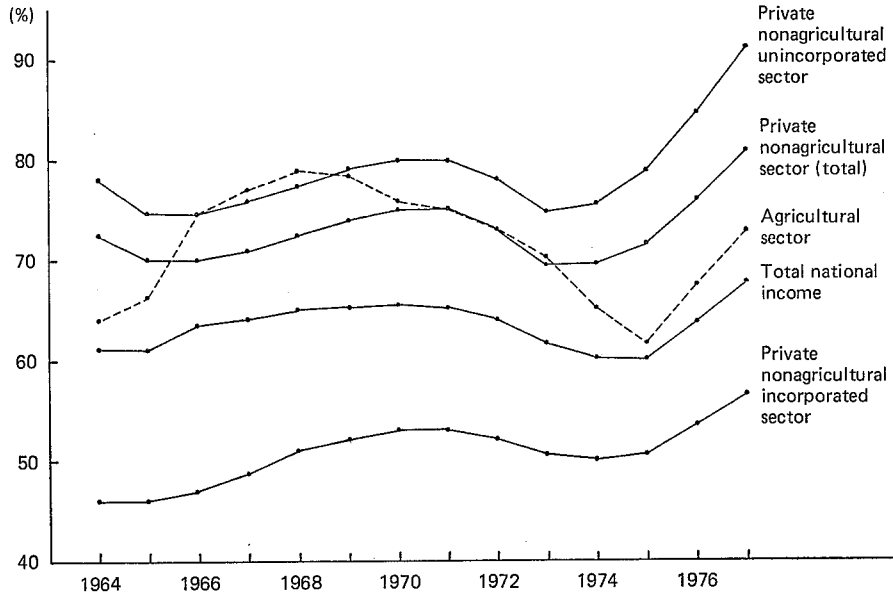
In Figure 13, we present wage differentials in textile industry by firm size. Not all the workers in the industry are unskilled of course. There are skilled workers with possible different proportions, and there must be productivity gaps too. However, it is true that most workers in this industry are unskilled or at best semi-skilled. Furthermore, the flow of workers in Korea was found to be from small and medium to large enterprises.¹¹ In this context, we can expect that if the labor market situation tightens, especially for the unskilled, wage differential by firm size will narrow. Figure 13 shows that, in relation to wages paid by the largest enterprises (500 or more workers) wage differentials of enterprises of all other sizes have sharply narrowed from 1975. This implies that the economy experienced structural change around 1975.

E. Changes in Labor Income Shares

As mentioned earlier, the changes in labor income share of a sector depend mainly on the rate of growth of wage rate, employment, relative price, and output. Turning point theory predicts that labor income share will change rather slowly

¹¹ See [1, pp. 292-94].

Fig. 14. Changes in Labor Income Shares (Three-Year Moving Average)



Source: Based on author's estimates.

until the turning point is reached. Of course it can change in any direction depending on the magnitude of the elasticity of substitution,¹² business cycle, etc. The labor share will rise rather markedly when the economy passes its turning point since the rate of growth of wage rate will outpace that of other related economic variables.

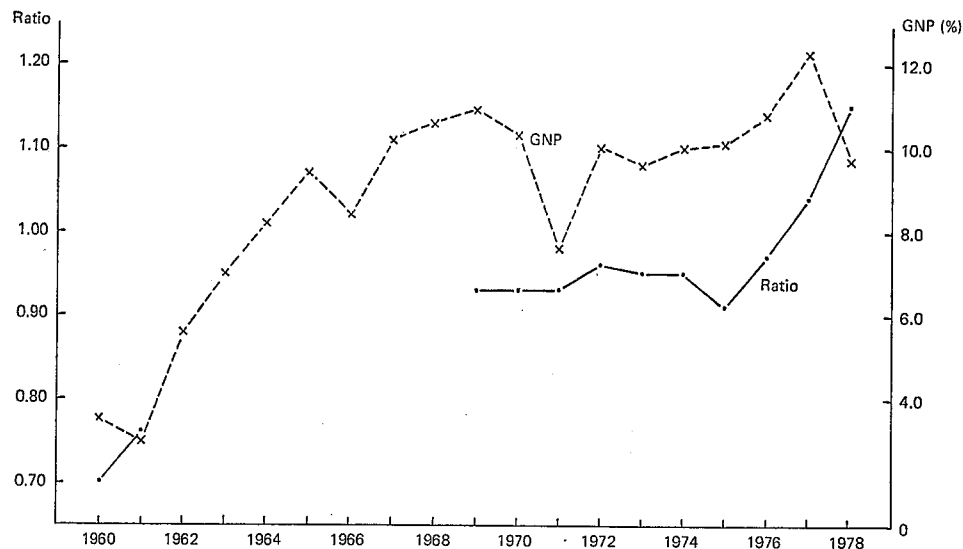
Figure 14 examines this aspect. It shows that the labor shares of various sectors other than the agricultural sector have changed in a similar fashion from the 1960s. They increased up to around 1971, declined for two to four years, and then rose quite sharply thereafter. The changes in these labor shares are positively related to the movement of GNP. The changes in the labor share of the agricultural sector were discussed earlier. When we include the agricultural sector, we see that all labor shares without exception started to rise rapidly from around 1975. These phenomena also seem to suggest that the turning point of the economy occurred in around 1975.

F. Changes in Job Opening/Applicant Ratio

Turning point theory does not directly predict anything about job opening/applicant ratios. We can, however, infer that as the economy approaches its turning point, and the labor market for the unskilled becomes tighter, the number of job openings will tend to be more than the number of job applicants. This seems especially plausible in the Korean case since most frequent users of public and private employment agencies have been unskilled workers until very recently.

¹² Professor Minami emphasized the magnitude of elasticity of substitution. See [7, pp.84-85].

Fig. 15. Changes in Job Opening/Applicant Ratio and in the Growth Rates of GNP (Three-Year Moving Average)



Sources: [2] and [12].

Note: The job opening/applicant ratio=no. of job openings/no. of job applicants.

In 1970, the proportions of job openings by job category were as follows: hostesses (65.1 per cent), housemaids (16.1 per cent), textile related jobs (2.1 per cent), etc. The average percentage of job openings for female workers during the period 1971-79 was 78.5 per cent.

Figure 15 shows that the job opening/applicant ratio has risen sharply from 1975. This upward trend seems quite strong. The growth rates for GNP are depicted for the same period in order to show cyclical effects on the opening/applicant ratio, although the two cannot be directly compared. To the extent that the job opening/applicant ratio reflects the tightness of the labor market for the unskilled, these data again seem to indicate the turning point of the economy around 1975.

IV. CONCLUDING REMARKS

We have tried to identify the turning point in the Korean economy. Various pieces of evidence combine to demonstrate that the Korean economy passed its turning point around 1975 and that the agricultural turning point occurred earlier, in the latter half of the 1960s. In the course of the analysis, we attempted to introduce the urban traditional sector explicitly to clarify the picture on this identification study.

It is strongly believed that distinctive structural changes occurred in the Korean labor market in the middle of the 1970s. This change, we argue, is identifiable even if we take cyclical effects into account. This is what we have tried to show

in the empirical study. In conclusion, the study supports the idea that the Korean economy passed its turning point around 1975.

Nevertheless, it would not be true to say that there are no reservations concerning the conclusion. Three points are to be noted. First, the period covered in this study is not sufficiently long to be certain of our turning point identification. Since there is no doubt, however, that the Korean economy had not experienced its turning point before the early 1960s, the rather short time series data on which our study is based do not necessarily raise serious problems. Second, we are still very ignorant of the labor characteristics of the UT sector. Of course not all those employed in that sector were treated as having low marginal productivity or wages from the outset, but the turning point could be identified with greater precision if we had better knowledge of the sector. Third, turning point theory does not necessarily imply total exhaustion of surplus unskilled labor. Therefore, when we talk about turning points we do not necessarily mean that no surplus labor is available. Rather, turning point theory depicts a situation where unskilled labor in general cannot be supplied without discernibly raising the wage rate. The theory is concerned with long-run tendencies of the labor market. In this regard, we admit that there is still quite a substantial potential surplus labor force in both rural and urban areas.

The economic factors behind the turning point phenomenon suggest many policy areas for scrutiny. They can be classified largely into three categories and we simply list some of them. First, factors influencing labor supply require study. These include wages, human capital formation (including formal education and on-the-job training), job placement, employment security, labor turnover, social attitudes toward work, various mobilizing policies for female workers, and various migration policies. Second, factors influencing labor demand should also be examined, among them industrial policies related to choice of technology, personal management, and industrial relations. Third, price policies need examination, including price support for agricultural products and basic necessities, and the balance between wage levels for rural and urban areas.

One more interesting avenue of study would be comparison of Korean turning point-related phenomena with the experiences of countries like Japan and Taiwan. These two countries experienced economic growth patterns similar to that of Korea and had already passed their turning points during the 1960s. But despite their similarities Japan and Taiwan have economic or labor market conditions which substantially differ. A comparative study could certainly reveal more about the factors influencing structural changes in labor markets and provide better policy guidelines based on them.

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