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Rural-Urban Wage Differential in a Lewis-Type Economy with Overlapping Generations*

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The difference between urban real wage and rural wage has so far been assumed to be exogenous. This paper provides a theoretical justification of this phenomenon. It is argued that the society as a whole may maximize the expected income of the current generation by paying the urban workers a higher real wage at the expense of the rural workers. If there is a non-zero probability of obtaining a high paying urban job in the future and the low paying rural jobs are guaranteed, the society as a whole may gain from an urban-rural wage differential. The differential remains as long as there is a large rural sector. The differential depends on the probability of losing the urban job, the probability of survival till the next period, the time discount factor, and the elasticity of labor demand in the urban sector. A formula for optimal wage differential is also derived. Given plausible values of the parameters, it is possible to show that urban-rural wage differential first rises and finally falls with higher urbanization and life expectancy rates.

I. Introduction

The phenomenon of rural-urban wage differential has been widely recognized by development economists. It has been observed that urban real wages have remained significantly higher than the rural real wages in many countries, which in some others the difference seems to have declined with development over time.[1]

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1. In the Monrovia region of Liberia, for example, urban incomes were 130 percent more than the rural incomes in the 1970s (ILO, 1982). For approximately the same period, the

Average urban income may be higher than average rural income simply because people with higher incomes may choose to live in the urban areas or because urban jobs require more skills and the income difference may reflect the compensating wage differential. Nevertheless, there is a general perception that even when one controls for these factors, urban wages are still higher than rural wages. Rather than equalizing real wages across sectors, the market adjusts by initiating labor migration from the rural to the urban areas. As far back as 1954, W. Arthur Lewis recognized this phenomenon.[2] Although Lewis did not provide a complete theory of this wage differential, most writers subsequently regarded this differential as exogenously given, and a huge literature, beginning with the celebrated Harris-Todaro model, developed based on this assumption. The reasons for this wage distortion, however, have remained somewhat of a mystery in the development literature.

The next section surveys the literature that attempts to explain the reasons for the wage gap. As argued below, these explanations are unsatisfactory. The existing literature in this area essentially considers a static framework. This paper provides an alternative *dynamic* explanation of the phenomenon. The model in section III below shows

urban-rural wage difference was 15 percent in Indonesia, 29 percent in Mexico, 11 percent in Pakistan, 53 percent in Tanzania and 24 percent in Tunisia (Ginneken, 1976, pp. 29). In the United States, the current difference is approximately 23 percent (Barancik, 1990).

2. "Earnings of the subsistence sector set a floor to wages in the capitalist sector, but in practice wages have to be higher than this, and there is usually a gap of 30 percent or more between capitalist wages and subsistence earnings. This gap may be explained in several ways. Part of the difference is illusory, because of the higher cost of living in the capitalist sector. This may be due to the capitalist sector being concentrated in congested towns, so that rents and transport costs are higher. All the same, there is also usually a substantial difference in real wages. This may be required because of the psychological cost of transferring from the easy going way of life of the subsistence sector to the more regimented and urbanized environment of the capitalist sector. Or it may be a recognition of the fact that even the unskilled worker is of more use to the capitalist sector after he has been there for some time than is the raw recruit from the country. Or it may itself represent a difference in conventional standards, workers in the capitalist sector acquiring tastes and a social prestige which have conventionally to be recognized by higher real wages. That this last may be the explanation is suggested by the cases where the capitalist workers organize themselves into trade unions and strive to protect or increase their differential. But the differential exists even where there are no unions." (Lewis, 1954, pp. 410-411).

that although a static notion of competitive optimum requires no wage differentials, the framework of Davidson, Martin and Matusz (1994) can be utilized to explore the determinants of an "optimum" wage differential in a dynamic context.

II. A Brief Survey of the Literature

Existing explanations of the rural-urban wage gap fall roughly under two categories: the standard neoclassical approaches developed by Stiglitz (1974) and Shapiro and Stiglitz (1984); and the Political Economy approaches developed by Lipton (1977) and Bates (1981). Although these papers provide valuable insights, both these approaches are somewhat unsatisfactory as general theories of rural-urban wage differential.

Consider Stiglitz's (1974) paper which is based on the idea of "labor turnover." The rural workers take a while to get used to the urban manufacturing jobs. Thus the firms must implicitly invest time and resources in worker-training every time a new worker is hired. Thus if a worker quits his or her job the firm loses its firm-specific investment on worker training and therefore labor turnover is costly to the firms. In equilibrium firms thus choose to pay a high wage to prevent workers from quitting their jobs. This is true even when substantial unemployment exists. Several criticisms can be made against this model.[3] First, it is not clear why the firms are unable to enforce a "no quit" contract to make up for the training costs. Second, the model assumes that the firms never face a shortage of labor. Thus the firms' labor turnover and the worker's quit rates are equal at all times. The worker's decision making problem and the job search process is not discussed. Basu (1984) also shows that the direction of wage inequality cannot be determined from Stiglitz's model: one may very well end up with a higher real rural wage.

The Shapiro-Stiglitz (1984) model on the other hand attempts to incorporate worker's decision making in an efficiency wage framework. The firms must pay a higher than market clearing wage, because some

3. See Basu (1981), Chapter 7, for an excellent discussion.

workers may shirk work. Since probability of detecting work-shirking is less than one, the firms pay a high wage because the shirking-workers will now face considerably less-paying jobs elsewhere, and thus shirking would be too risky for them. One can modify this model to argue that if industrial work requires close monitoring, the urban wages would tend to be higher for the reasons mentioned above. But this model is also not entirely satisfactory, because as Matusz (1994) argues, in equilibrium no worker shirks, no one gets fired and the job-seekers never get a job, since no vacancies open up! It is difficult to justify pervasive urban rural wage differential on the basis of these models.[4]

On the political economy side, Lipton (1977) has argued that an urban bias exists because rural residents are politically powerless. Urban residents are more articulate, urban workers are more unionized[5] and more powerful. Typically in these studies urban or industrial bias is seen through the changes in industry-agriculture terms of trade ratio. The terms of trade move against agriculture as towns extract surplus from the countryside, much like the early days of Soviet industrialization.[6] Bates (1981) has provided crop-specific examples from Africa to substantiate the urban-bias theory. There are, however, several problems with the urban-bias approach as well.[7] First, a clear distinction between urban and rural asset holders cannot be made; and it is not clear that a rise in terms of trade in favor of the urban sector necessarily deteriorates the *income*-terms-of-trade of all rural-asset holders. Second, the political institutions through which such bias is

4. Bucci (1993) has used this model to estimate the relation between rural urban wage differential based on a hedonic compensating wage differential model for India. The real rural-urban wage differential in India in the 1970s turned out to be roughly 17%. Based on the Shapiro-Stiglitz model, endogenously determined wage differential was regressed on exogenously determined unemployment differential in the two sectors, controlling for education and other externalities. As argued in the section III, (1) unemployment should be treated as an endogenous variable, and (2) the unemployment figures may not reflect the activities in the vibrant informal sector of the country. In any case, one needs to test this model across time periods for different countries.
5. See also Calvo (1978).
6. For an superb discussion of these issues and the Preobrazhenski-Bukharin debate, see Mitra (1977).
7. See Varshney (1993) for a survey.

expressed in collective choice models in both democratic and authoritarian regimes is not quite adequately discussed. There is no clear analysis of what happens as the economy goes through the Lewis dynamic process as it industrializes. Does urban bias disappear eventually? By raising the issues of "class interests" and "class conflicts" the urban-bias approach must consider each case and no generalizations are possible. It is not very clear why for all the countries in the world, in general, urban bias exists or existed at the early stages of industrialization.

Ⅲ. The Model

This section provides an alternative hypothesis of urban bias based on the idea that given free movement of labor, the real wages[8] between the urban and the rural areas equalize only when a one period economy is considered. Since urban manufacturing jobs are capitalistic, and not family-based, there is always a job insecurity associated with urban jobs. But the rural income can always be earned with absolute certainty.[9] If the workers are forward-looking they realize that as long as every one has a shot at receiving a higher urban wage with a non-zero probability over one's life time, the expected future income of all workers will increase if urban wages are higher. The society, therefore collectively decides to put a premium on urban wages because a higher urban wage would increase the expected lifetime incomes of the population currently alive.

The analysis of this paper is based on Samuelson (1958) and Davidson, Martin and Matusz (1994). Samuelson argues that in an overlapping generations model, a net transfer of income from the young to the old enables the old agents to consume more than the value of their endowments, while the remaining young agents consume output according to their endowments. This creates a social surplus: To take Samuelson's example: if chocolates melt, today's young can donate some chocolates to the old with the understanding that when the young

8. Assume that rural income consists entirely of wages.
9. This was assumed by Lewis. Conclusions of this paper will be valid as long as rural income is more certain than urban income.

become old the new young generation would do the same. No one loses, and the society gets a surplus. An implicit intergenerational agreement between the old and the young increases the social surplus in Samuelson (1958), and an implicit intergenerational agreement between the employed and the unemployed increases the social surplus in Davidson, Martin and Matusz (1994). Similarly in this paper an implicit intergenerational agreement between the rural and urban residents increases the social surplus. The rural workers would be willing to donate part of their income to the urban workers, with the understanding that there is a non-zero probability that today's rural workers may get an urban job tomorrow and reap the benefits granted today. The only offsetting factor is that such wage distortions create production inefficiencies in each period. So the decision to embrace a wage differential has to take account of this social cost. The paper extends the analysis of Davidson, Martin and Martusz to show that there is thus an *optimum* differential in wages between the urban and the rural sectors.

Consider the case of an economy with two sectors: rural and urban. Following Lewis, assume that the rural sector is family-managed and follows a simple linear production function. The value of output equals total wages paid.

$$X_{rt} = W_r L_{rt}. \qquad (1)^*$$

X_{rt} is the rural output in period t, W_r is the effective rural wage, and L_{rt} is the number of rural workers in period t. Price of the rural good is normalized to 1. In this paper only the steady state values of the variables will be considered. To simplify the notation the time subscripts are dropped and $(1)^*$ is rewritten as[10]

$$X_r = W_r L_r. \qquad (1)$$

The urban capitalist sector produces an output of X_u in each period, the revenue from which is distributed as

10. The steady state population size is fixed at $L = L_u + L_r$.

$$X_u = W_u L_u + R_u. \quad (2)$$

The number of urban workers in each period is denoted by L_u. Each of the L_u workers earns a real wage W_u. Total urban profits are denoted by R_u. Price of the urban good is also normalized to 1 (thus effectively the rural and urban goods are the same). The rural-urban wage differential δ, which initially is assumed to be less than, equal to, or greater than 1, is given by

$$W_u = \delta W_r. \quad (3)$$

The rural economy is organized as family farms or as worker cooperatives and the distinguishing feature of this system, from the point of view of a rural resident is that the rural income can be earned with certainty. In the rural area he can either work in his family farm, or he can get a job as a hired farm-hand, or work as a share-cropper for a landlord. Since everyone knows him in the village, the village institutions guarantee that he obtains the rural income W_r with probability 1. Finding a job in the city is another matter. No one knows him in the city: finding a job there is uncertain. However, once he gets a job in the urban area in the beginning of period 1, there is always a non-zero probability that he will be able to retain this job in period 2, and in subsequent periods. The probability of *losing* a job in the subsequent period is p, and the probability of retaining the job in the subsequent period is 1-p. At the end of every period, each worker faces a non-zero probability of death d. Assume that this probability is the same for all workers - urban and rural.

A large unemployed force can exist in this model in both rural and urban areas. However since unemployment is not the main focus of the paper we simplify the analysis by assuming that rural wages (W_r) is adjusted for periodic rural and urban unemployment such that it reflects an "average" income earned with certainty.[11]

11. An implicit assumption of the Harris-Todaro literature is that the urban unemployed survive through dissaving. By suitably changing the definition of the time period, one can reinterpret the Harris Todaro model to mean that the urban job-seekers who fail to get a job, in fact, return to the rural areas within this time period before their assets

Assume that urban job positions open up at the beginning of each period either when an urban worker dies at the end of the last period, or when some urban workers lose their jobs with an exogenously given probability p mentioned above.[12] The expected lifetime income for a risk-neutral urban worker (who knows that he has been hired for the period) is thus given by[13]

$$Y_u = W_u + (1-d)[(1-p)Y_u + pY_r]. \quad (4)$$

The steady state equation (4) shows that an urban worker earns W_u this period with certainty (recall that deaths occur only at the end of the period), and in the following period, if he is alive, he has a (1-p) percent chance of retaining the current urban job, and a p percent chance of returning to the village where he earns an expected steady state lifetime income of Y_r.

The steady-state rate of new jobs available every period, is $L_u[d + (1-d)p]$ where L_u is the steady-state level of urban employment. Note that the total number of urban jobs equal the vacancies due to the deaths that occurred at the end of the last period and due to job separations that occur at the beginning of every period.

deplete to zero. In an LDC where almost no unemployment benefits are available, the unemployed must have at some point worked to earn their consumption. If a worker loses his high paying urban job, he need not wait in the city for the Harris Todaro "job lottery" to take place in the next period. He can come back to the village to earn his certain income and can wait for the urban job lottery results in the village itself. Recent research has shown that (1) many of the so called urban unemployed are in effect employed in the informal sector (Bhattacharya, 1993), (2) The role of urban-rural family ties are important so that it is often possible for a rural worker to get an urban job through the family and friends in the cities. In addition, urban firms can and do directly recruit in the rural areas (Bhattacharyya, 1985). For these reasons we subsume all unemployment and non-formal sector jobs under L_r.

12. We do not concern ourselves with the determination of the value of p. The value of p may very well depend on business cycle and international market conditions.
13. This is true in steady state where the value of Y_u will be the same in period t and t+1. Similar reasoning applies for Y_r. If the workers are risk-averse the conclusions of this paper will be less robust. It has been assumed in (4) and (6) below that the workers do not discount future consumption. This assumption is not crucial for the analysis and has been made to greatly simplify the algebra. If a time discount factor is added, in effect it reduces the probability of living till the next period, and will most probably increase the rural urban differential. See below.

In this overlapping generations framework, assume that the population has also reached a stationary state and number of births exactly equal number of deaths at each period. Number of end-period deaths are exactly matched by a new cohort which appears at the beginning of the next period. The newborns are automatically eligible to work in rural family-farms.[14] The urban-job-seekers in each period, therefore, constitute the following: (1) the newborns who exactly replace the deceased urban workers, and therefore equal $L_u d$, (2) the urban workers who lose their jobs: $L_u(1-d)p$ and, (3) the rural residents (and the unemployed) who now equal $L_r(d+1-d)=L_r$ again. Assuming that all urban-job-seekers have the same probability of finding a job, we can calculate probability of finding an urban job as

$$\pi = L_u[d+(1-d)p]/\{L_u[d+(1-d)p]+L_r\}. \quad (5)$$

In (5) the numerator shows the number of vacancies and the denominator is the number of urban and non-urban workers (and the unemployed), including the newborns.

In a steady state, the rural worker has a probability π of finding an urban job. If he does not get the urban job, he earns W_r with certainty and thus he has a probability $1-\pi$ of earning W_r. The expected lifetime income of a rural worker in steady state is

$$Y_r = \pi Y_u + (1-\pi)[W_r + (1-d)Y_r]. \quad (6)$$

Assume that proportion α of total labor force is employed in the urban sector[15] at steady state.

$$L_u = \alpha(L_u + L_r) = \alpha L; \quad 0 < \alpha \leq 1. \quad (7)$$

A stylized fact of the Lewis model is that as the dual economy

14. We are ignoring the childhood years for analytical simplicity.
15. An overwhelming number of theoretical and empirical studies have shown that employment in the urban manufacturing sector depends on a host of factors in long term development: capital accumulation, public policy, savings behavior and many other aspects of structural change. For the purpose of this paper, these are treated as exogenous.

develops, *for each successive steady state,* there will be higher private investment and higher public infrastructural investment which will increase urban manufacturing jobs and the population will move from the rural to the urban areas and α will rise[16] till it becomes close 1. For a given α, we can now use the system of equations (3) - (7) to solve for Y_u and Y_r for the steady state. Algebraic manipulations yield.

$$Y_u = Y_r + (W_u - W_r)(1-\alpha)/[1-(1-p)(1-d)], \tag{8}$$

$$Y_r = [\alpha W_u + (1-\alpha)W_r]/d. \tag{9}$$

Next, we find out the total expected income of all workers at the end of each period. At the end of a period $dL_u + dL_r$ people die and dL_u positions open up in the urban areas. At the beginning of each period, when the job vacancies in the urban sector are not yet occupied, $(1-d)(1-p)L_u$ "old" workers work in the urban areas, and the rest $[L-(1-d)(1-p)L_u]$ work in the rural areas. The total perceived lifetime income for urban and rural workers at the end of a period is thus:

$$\begin{aligned} Y_{u+r} &= (1-d)(1-p)L_u Y_u + [L-(1-d)(1-p)L_u]Y_r \\ &= [L_u W_u + L_r W_r]/d + QL_u(1-\alpha)(\delta-1)W_r, \end{aligned} \tag{10}$$

where $Q = (1-p)(1-d)/[1-(1-p)(1-d)]$.

Consider now the expectations of the urban capitalists. The urban capitalists receive a per-period steady state profit R_u, with the same probability of death at the end of each period. Their expected lifetime income is thus given by $R_u[1+(1-d)+(1-d)^2+(1-d)^3+\cdots] = R_u/d$. Thus the expected lifetime income for all agents in the economy is given by [using (1)-(3)]

$$Y = Y_{u+r} + R_u/d = (X_u + X_r)/d + QL_u(1-\alpha)(\delta-1)W_r. \tag{11}$$

The lifetime expected national income Y *exceeds* lifetime expected gross domestic product $(X_u + X_r)/d$ as long as $\alpha < 1$, $\delta > 1$ and $p > 0$. Expected income is different from expected output in this economy

16. The value of α not only depends on the wage differential, it also depends on public and private investments.

when all three conditions hold. Note that we do not get this result in the static case when $d=1$; the agents are then not forward looking, and it can be shown that if $d=1$, the competitive equilibrium requires that $W_u = W_r$; i.e., only if the workers are certain of death at the end of each period, they optimize over a single period and the conventional result that expected income equals expected output, holds. Notice that since rural income is certain, and urban income occurs with non-zero probability, the risk-neutral society may be willing to subsidize the urban wage. In that case the society behaves like the overlapping generations of Samuelson, and a wage differential may well be imposed.

How does the collective will of this society determine the urban-rural wage differential? If the social planner represents the generation alive at the end of the period, the planner will recognize the following: (1) Higher urban wages will increase the potential future income of all workers. The lifetime income increases for urban workers, since they have a positive probability of retaining the current high paying job: an increase in urban wages will also increase the lifetime income of the rural workers, because this also raises their future expected income. (2) But of course the wage differential cannot go up indefinitely: an increase in urban wages clearly reduces total number of jobs offered in the urban sector, i.e., $W_u = W_r$ is a Pareto optimal policy in the sense of *efficient production* in each period. Any sectoral wage distortion reduces the number of urban jobs. But this job loss is counteracted by an increase in expected income of all the workers currently alive, as shown above. Consequently, the representative social planner will maximize (11) with respect to δ. This exercise yields the first order condition

$$dY/d\delta = [dX_u/dL_u][dL_u/d\delta]/d - W_r[dL_u/d\delta]/d - QW_r[dL_u/d\delta][1-2L_u/L] + QW_rL_u[1-L_u/L] + W_rQ\delta[dL_u/d\delta][1-2L_u/L] = 0. \quad (12)$$

Note that (12) is not a closed form solution because L_u and hence α will depend on δ. If, however, we assume that the elasticity of the labor demand curve with respect to wages is constant in the neighborhood of equilibrium, the optimum rural urban wage differential can be derived as

$$\delta = 1/(1+z/\eta) \quad (13)$$

where $z=Q(1-\alpha)/[1/d+Q(1-2\alpha)]$ and η is the constant elasticity of the urban labor demand curve $\eta=(\delta/L_u)dL_u/d\delta<0$.

For all positive values of δ, since $\eta<0$, the value of δ must be greater than 1, i.e., urban wages must be higher than rural wages. From (1), (2) and (11) the urban-rural wage differential will obviously reduce the welfare of the capitalists. There is a *potential* increase in expected national income - and we assume that the society collectively decides to realize this surplus.[17] It is now conceivable that the so called distortion between the urban and the rural wages may well be "optimal" from the point of view of the current generation. Over a longer period of time the value of α will increase through the Lewis process. If we assume that the elasticity of labor demand remains constant but α rises as a result of private and public investments, it can be shown that

$$\partial\delta/\partial\alpha<0. \tag{14}$$

Economies with a large rural labor force will also show a high rural urban wage differential. The Lewis process that transfers workers from the rural to the urban areas will eventually reduce the wage differential at constant labor demand elasticities. If the labor demand elasticity changes through the Lewis process, then of course, (14) may not hold.

The effect of two other variables, d and p, on wage differential for a given α is ambiguous in general. But some interesting possibilities arise. It can be shown that if the economy is primarily agricultural such that $\alpha<0.5$ and if p is low such that $d>p/2$, a fall in the death rate will increase the urban bias (i.e., will increase δ). This raises the possibility that rural urban wage differential may follow an inverted U curve: For an underdeveloped country with low α and high d, the wage differential will *increase* first. Later, as α becomes more than 0.5, and economic development reduces the death rate such that $d<p/2$, the wage differential will start to decline.

So far it has been assumed that the time discount rate is zero. If this assumption is relaxed, it can be shown that as long as the workers do not discount future consumption too heavily, the optimal differential formula still holds. This is proved as follows: with a time discount

17. The winners must compensate the losers through an appropriate tax-subsidy scheme.

factor β, (4) and (6) can be re-written as

$$Y_u = W_u + (1-d)\beta[(1-p)Y_u + pY_r], \quad (4)^*$$

$$Y_r = \pi Y_u + (1-\pi)[W_r + (1-d)\beta Y_r] \quad (6)^*$$

and R_u/d is rewritten as $R_u/[1-(1-d)\beta]$. Note that the value of π in (5) does not change, since the probability of finding urban jobs does not change. Now assume that β is not "too low," i.e., $(1-p)(1-d)(1-\beta)$ approximates zero. The algebra can now be reworked to show that the new optimal differential is given by (one again assuming a constant η).

$$\delta = 1/(1+z^*/\eta); \quad (13)^*$$

where $z^* = Q(1-\alpha)/[1/(1-(1-d)\beta)+Q(1-2\alpha)]$.

When β is less than 1, but not too small, such that $(1-p)(1-d)(1-\beta)$ is close to zero, in general, the optimal differential will increase! The intuition behind this result is straightforward. When a time discount is added it works as if the probability of death rises, i.e., $(1-d)\beta < (1-d)$ (see $(4)^*$ and $(6)^*$), but π remains the same. Thus on the margin, there will be more desire to increase the wage differential such that high expected income can be realized quickly before death occurs.[18]

The overlapping generations model of the dual economy above can now be used to provide some justification for Lewis's observation that there is approximately a thirty percent difference between the urban and the rural wage rates. What configurations of parameters would produce this differential? This is carried out in Table 1 below. The historical values of crude death rates and the labors's share of the urban sector are available. Crude death rates in the poorer countries ranged from 50 per thousand to about 10 per thousand over the years 1900-1990. Urban labor share is also roughly about 10 to 80 percent over this period.[19] But we do not know the elasticity of the labor demand curve η and the probability of losing an urban job (p). If these two numbers

18. However, if β is too low, $(1-d)\beta$ is low enough such $(1-p)(1-d)(1-\beta)$ is significantly different from zero, this result does not hold. In the extreme case when β is close to zero, the model approximates a one-period standard optimization framework. In this case a wage differential is not justified.

19. See the World Tables published by the World Bank.

were available we could have directly tested Lewis' 30 percent differential hypothesis on the basis of the model. We can however construct alternative scenarios under which the Lewis hypothesis will hold.

Table 1 reports some simulation results with the assumption that the elasticity of labor demand curve is given by $\eta = -0.32$. This value is selected in conformity with the empirical findings in the developed countries.[20] The table simulates plausible values of crude death rates (d) and the probability of losing urban jobs (p) that are consistent with the 30 percent rural urban wage differential hypothesis of Lewis.

As stated earlier, crude death rates in some very poor underdeveloped countries in 1900 - 1990 ranged from 0.05 to 0.01 with about 10 - 80 percent workers in the non-agricultural sector. These numbers produce a 30 percent differential with 14 to 30 percent probability of job loss (see Set 1 and Set 2). One can also postulate that with economic development, both d and p fall as α rises. This hypothesis is broadly in conformity with the stylized facts (see Set 3). As can be observed from the table, the simulation sensitivities with respect to d and p are extremely high and a wide variety of death and job loss rates are consistent with the Lewis hypothesis. Note however, irrespective of the values of d and p, as α increases as a result of capital accumulation in the industrial sector, the rural urban wage differential falls, with δ asymptotically approaching 1 when all workers move to the urban sector.

Ⅳ. Concluding Comments

It is commonly believed that the culture of the urban life is different from the culture of the rural life. Following the spirit of the Lewis model, if we assume that the culture of risk-sharing and providing mutual job security is more prevalent in the rural sector, urban workers will get higher wages in the Lewis model even under the assumption of risk-neutrality. If the workers are risk averse this differential will increase.

Urban rural wage differential, and urban bias is a complex phenomenon. The purpose of this paper was not to argue that *all*

20. Hamermesh (1986) has estimated that a "consensus" estimate of elasticity of labor demand is -0.32.

urban-rural wage differences are efficient or optimal. Actual occurrence of the wage differential may partly be explained by the degree of risk-aversion, the logic of the labor turnover or efficiency wage models, or even by the alliances and the labor unions along the lines suggested by many authors. The purpose of this paper was simply to point out that a static analysis may not always be useful to explain why urban wages do not fall to achieve Pareto optimality. A forward looking view of the rational agents in these markets may explain why, under certain conditions, a fairly substantial difference in income may be tolerated, and indeed desired by the society.

Table 1 Simulations for the Lewis Hypothesis

Configurations that yield 30% Urban-Rural Wage Differential

Assumptions: $\delta = 1/(1+z/\eta)$; $\beta = 1$; $\eta = -0.32$; $\delta = 1.3$

Set 1			Set 2			Set 3		
Decreasing Death Rates (d)			Decreasing Probability of Job Loss p			Decreasing Death Rates (d) and Decreasing Probability of Job Loss p		
d	p	α	d	p	α	d	p	α
0.09	0.14	0.82	0.12	0.50	0.14	0.09	0.05	-
0.08	0.14	0.80	0.09	0.45	0.15	0.08	0.45	0.03
0.07	0.14	0.77	0.07	0.40	0.15	0.07	0.40	0.11
0.06	0.14	0.73	0.06	0.35	0.15	0.06	0.35	0.17
0.05	0.14	0.70	0.04	0.30	0.11	0.05	0.30	0.21
0.04	0.14	0.83	0.03	0.25	0.12	0.04	0.25	0.24
0.03	0.10	0.87	0.03	0.20	0.13	0.03	0.20	0.25
0.02	0.10	0.50	0.02	0.15	0.12	0.02	0.15	0.51
0.01	0.12	0.10	0.01	0.10	0.18	0.01	0.10	0.54

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