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Author(s): Biswajit Banerjee

Source: *Oxford Economic Papers*, New Series, Vol. 35, No. 3 (Nov., 1983), pp. 399-422
Published by: Oxford University Press
Stable URL: https://www.jstor.org/stable/2662963
Accessed: 26-03-2020 12:06 UTC

Oxford Economic Papers 35 (1983), 399–422

THE ROLE OF THE INFORMAL SECTOR IN THE MIGRATION PROCESS: A TEST OF PROBABILISTIC MIGRATION MODELS AND LABOUR MARKET SEGMENTATION FOR INDIA*

By BISWAJIT BANERJEE

Abstract

A BASIC hypothesis of probabilistic migration models is that informal sector employment is a temporary staging post for new migrants on their way to formal sector employment. In this paper we argue that there are no conclusive tests of this hypothesis in the empirical migration literature, and examine evidence from a sample survey to test if the informal sector in Delhi performs the role postulated in probabilistic models. We also test some of the main hypotheses of the segmented labour market theory, a popular alternative to neo-classical theory for analyzing the structure of urban labour market in developing countries. The empirical evidence indicates that the migration process postulated in probabilistic models does not seem to be realistic in the case of Delhi, and that the segmentation model is only partially valid. Over one-half of the informal sector entrants had been attracted to Delhi by opportunities in this sector itself; actual and potential mobility from the informal to the formal sector was low; education and urban experience were rewarded at the same rate in both sectors; and education was one of the important determinants of mobility between sectors.

I. Introduction

A major innovation in the analysis of rural-urban migration in developing countries has been the formulation of probabilistic models. This class of models, first developed by Todaro (1969), views migration as a two-stage phenomenon in which migrants initially spend some time in the so called

* At the time of writing this paper I was on the staff of the Institute of Economics and Statistics, University of Oxford. The survey which provides the data base for this paper was financed by a grant (RF71078, Allocation no. 16) from the Rockefeller Foundation, and was conducted by me when I was visiting the Institute of Economic Growth, Delhi, during 1974–76. I gratefully acknowledge the assistance and facilities provided to me by all these sources. Earlier versions of the paper were read at the Development Studies Association conference held at Swansea in September 1980, and at a seminar at the Woodrow Wilson School of Public and International Affairs, Princeton University in January 1982. I am grateful to the seminar participants, and to David Begg, Chris Gilbert, Keith Griffin, Gordon Hughes, John Knight, and Ken Mayhew for helpful discussions and comments. I have also benefitted from the comments of two anonymous referees. However, I am alone responsible for the views expressed, and for all errors and omissions.

'urban informal' sector or remain unemployed before finding a job in the 'formal' sector. Employment in the informal sector serves as a means of financing the period of search for formal sector employment. In their decision to migrate, potential migrants balance the probability of unemployment or informal sector employment against the real income differential between the urban formal sector and the rural area. The main assumptions underlying probabilistic migration models are:

(a) the urban labour market is divided into two sectors: a high-wage formal sector in which the wage rate is set above the market clearing level and is downwardly rigid, and a low-wage informal sector which is characterized by high rate of turnover and, thus, freedom of entry;

(b) migrants are attracted to the urban centre by opportunities and the associated wage structure in the formal sector;

(c) search for urban jobs has be conducted from the urban centre itself;

(d) participation in the informal sector does not interfere significantly with search for formal sector employment; and

(e) mobility from the informal sector to the formal sector is possible and does take place.

The theoretical literature on probabilistic migration models is now vast.[1] The empirical research is, however, deficient in tests of such models. Virtually none of the many recent empirical studies, influenced and guided by probabilistic models, adequately tests the hypothesized role of the informal sector being the transition sector for migrants entering it, and studies which have examined the empirical validity of assumptions (b) to (e) listed above are rare.[2] There is clearly a need for such an examination. In a study on Kenya published by the International Labour Office it has been suggested that "it is not only the high-wage formal-sector job that attracts the potential migrant, but also the income opportunity in the informal sector" (1972, p. 224). Some researchers (e.g. Breman (1976)) also believe that the urban labour market structure prevailing in developing countries is not accurately portrayed in probabilistic migration models. They accept assumption (a) above but disagree with assumption (e). Instead they argue that the labour market is segmented. According to them there is little mobility between the informal and formal sectors; once individuals enter the informal sector they are trapped there, not so much because they lack the human capital required for formal sector jobs as because of institutional barriers on the demand side.

The segmented labour market model also hypothesizes that the wage determination process is different in the two sectors. In particular, it is argued that human capital is rewarded at a lower rate in the informal sector. An extreme view on this is that the effect of educational attainment on

[1] Todaro (1976) contains a brief review of the many modifications and extensions of the basic Todaro model. Among the more notable studies are Harris and Todaro (1970), Johnson (1971), Fields (1975), and Mazumdar (1975).

[2] One exception is a study by Merrick (1976) on Belo Horizonte in Brazil.

earnings in the informal sector is insignificant, and that workers there exhibit a flat profile of earnings across age groups. These ideas, borrowed from the developed country labour market literature, were first extended to developing countries by Dore (1974), and have been so far empirically tested for a limited number of countries only.[3]

A primary objective of this paper is to examine if the informal sector in India performs the role postulated in probabilistic migration models through a testing of the empirical validity of the assumptions on which these models are founded. The paper also tests the hypotheses of the segmented labour market model that human capital is rewarded differently in the formal and informal sectors, and that barriers that are not based on human capital restrict mobility between the two sectors. Section II describes the data base, and discusses the methodology to be used in the analysis of the data. Section III contains the empirical results, and Section IV the conclusions.

II. The data and the methodology

The data

The empirical base of the paper is a survey, conducted by the author from October 1975 to April 1976, of migrant heads of households in Delhi.[4] At the first stage of the survey 10,000 heads of households were enumerated in 76 census blocks—representing 1.14 per cent of the total number of census blocks into which the city was divided—which were selected by weighted stratified random sampling. At the second stage no sampling was involved, and all heads of households who satisfied the following criteria were interviewed in detail: (i) male, (ii) born outside Delhi, (iii) age on arrival in Delhi being 14 years or more, (iv) came to Delhi in 1965 or later, and (v) came after securing employment or in search of employment. The last criterion eliminates migrants who were transferred to Delhi by their employers, and those who had come as dependants and students. A total of 1,615 migrant heads of households, of whom 1,408 had come from rural areas, were interviewed in considerable detail in the second stage. The focus throughout this paper is on migrants from rural areas.

The methodology

In previous micro studies on migration, tests of the hypothesis on the role of the informal sector have tended to mainly centre around two exercises: (i) estimating the importance of the informal sector, or of occupations and industries considered to be representative of the informal sector, either as

[3] Carnoy (1980) summarizes the results of five studies on developing countries—namely, Brazil, Mexico, Peru, Cameroon and Singapore—which concentrate on differences in earnings functions between different types of jobs.

[4] Results of prior analyses of the survey data and details of sampling procedure are contained in Banerjee (1981).

the point of entry into the urban labour market or as the location of current employment (e.g. Sabot (1977), Sethuraman (1976)); and (ii) comparing the distribution of the current occupation, industry or sectoral affiliation of migrants with varying lengths of urban residence (e.g. Joshi and Joshi (1976), Mazumdar (1976), Oberai (1977), Yap (1976)).[5] These exercises provide considerable insight into the structure and operation of the urban labour market, but they do not constitute conclusive tests of the predictions of the probabilistic migration models.

Suppose the data indicate that a majority of migrants entered the formal sector on arrival in the urban centre. On its own this would not constitute evidence against the probabilistic migration models. In this class of models direct entry into the formal sector reflects preference of individuals to search for employment in this sector on a full-time basis and their ability to finance the search. On the other hand, the hypothesis could not be accepted merely on the basis of evidence indicating that a majority of migrants entered the informal sector on arrival or were currently in it, for many migrants may have come to the urban centre expecting to take up employment in the informal sector. The probabilistic models exclude by *assumption* the possibility that the informal sector is the target sector of migrants. A prediction which follows logically from the assumption that migrants are attracted primarily by opportunities in the formal sector is that in equilibrium the earnings in the informal sector are lower than those in the rural area from which the migrants originated. However, studies by the International Labour Office (1972, p. 224) on Kenya, and Joshi and Joshi (1976, pp. 165–66) on India have noted that average informal sector earnings are roughly equal to if not higher than rural earnings. The relevant exercise would therefore be to determine explicitly whether those who enter the informal sector consider employment there to be a means of survival while waiting in the queue for formal sector jobs.

To determine the attitude of migrants towards informal sector employment, in this paper we estimate the prevalence of lining up urban jobs from the rural area, and examine the search behaviour of migrants subsequent to taking up their first urban jobs. Informal sector entrants who lined up their jobs from the rural area were likely to have been under no illusions about where they were heading, and migrants who considered informal sector employment as a 'holding' operation would be looking for alternative employment after entering it.

The hypothesis on mobility between the informal and formal sectors is crucial to both probabilistic migration models and the segmentation model. The exercise in previous studies which relates current occupation, industry or sectoral affiliation to duration of residence in the city attempts to provide indirect evidence on the point of entry and the pattern of mobility. The evidence from this exercise has to be interpreted with caution. The current

[5] Rempel and Lobdell (1977), Chapter 5, survey the evidence from these exercises.

position of recent migrants need not reflect the experience of longer standing migrants when they first arrived in the city, as labour market conditions and the structure of employment may have changed. Further, a superior distribution for longer standing migrants does not necessarily reflect mobility; it is also consistent with lack of mobility. Of the migrants arriving in any particular year some are likely to return to their place of origin because they are not able to realise their pre-migration expectations or because they came to the city for seasonal or short-term employment. Such migrants are more likely to have entered activities characterized by free entry. This would account for longer standing migrants having a superior occupational, industrial or sectoral distribution, without these migrants themselves having changed jobs. It is clear from this that direct evidence on mobility between sectors would be more appropriate for testing the models. Unfortunately, studies based on such evidence are rare. A study by Merrick (1976) is the only one known to the author.

The data base of this paper permit us to consider direct evidence on mobility. In the labour market literature there is almost no discussion of what degree of mobility would be sufficient to reject the segmentation model and rule in favour of probabilistic models.[6] It is difficult to judge whether mobility is 'high' or 'low' from an estimate which indicates the mobility that has taken place upto the date of the inquiry, as this represents the average experience of a large number of cohorts over varying periods of time. Therefore, in the empirical exercise we compare the proportion of new arrivals in a particular year who enter the formal sector directly with the proportion of informal sector entrants in the previous year who moved to the formal sector within twelve moths of arrival. Assuming that new arrivals in a particular period and migrants who entered the informal sector in the previous period compete for formal sector jobs, it would be expected that in the absence of segmentation, *ceteris paribus*, the proportion of these informal sector entrants who are able to find formal sector jobs during that particular period will be the same as that of new arrivals who enter the formal sector directly. However, as mobility is likely to be lower if new arrivals are better qualified, we consider the proportion of new arrivals with no education who enter the formal sector directly as a minimum benchmark for judging the degree of mobility.

In the empirical exercise we also estimate a model of inter-sector mobility, using logit analysis, to examine if the claim of the segmented labour market model that human capital considerations are not important in explaining mobility is valid. In this context, we also analyze the determinants of sector of entry within the framework of a multinomial logit model. Together with the multivariate exercise on mobility, this analysis will provide a detailed picture of the absorption pattern of migrants in the urban labour market in India.

[6] See Wachter (1974), pp. 658–9, and Cain (1976), p. 1231.

A discussion of the urban labour market in terms of sectors becomes meaningful only if it can be established that these sectors exist, in terms of differential earnings. The empirical identification of the sectors has to be based not on the level of earnings but on the determinants of dualism—viz. the presence of institutional influence, and the organization and technical characteristics of the production process. The criterion used in this study is associated with government legislation. Employees in government and public sector establishments, and in privately owned establishments employing 20 or more workers are assigned to the formal sector. All other workers belong to the informal sector. A distinction is also made within the informal sector between wage employment and non-wage employment. Since virtually all establishments covered by this definition of the formal sector are required in India to provide data on a regular basis to government agencies it is most likely that government protective legislation will be implemented by them.

The mean monthly earnings in 1976 were Rupees 350 in the formal sector, Rupees 218 in the informal wage sector, and Rupees 516 in the non-wage sector.[7] The distribution of earnings in these three sectors overlapped, and that for the non-wage sector lay to the extreme right. In order to determine whether these earnings differentials persist when account is taken of differences in 'supply characteristics' of workers and also to test the hypothesis of the segmentation model that the process of wage determination in the formal and informal sectors is different, we carry out earnings function analysis. As the earnings of non-wage workers include returns to capital and entrepreneurship, the analysis is limited to wage employees to obtain more meaningful results.

III. Empirical results

Earnings function analysis

The estimated earnings functions for all wage employees in the sample and separately for the formal and informal wage sectors are presented in Table 1. The dependent variable is the natural logarithm of monthly earnings. The independent variables include the conventional human capital variables in a slightly modified form, and a set of variables representing the influence of structural factors, family and environmental background factors, and personal attributes not directly measured.

Age on arrival in the city is included as an explanatory variable to

[7] In 1976, 1 U.S. dollar = 9 Rupees approximately. The monthly earnings of salaried employees include the basic wage, all allowances and bonuses before tax. For those who were paid daily wages or worked on a piece-rate basis, monthly earnings were calculated on the assumption that they worked for 25 days at the wage rate indicated by them. No account was taken of earnings from overtime work. Non-wage workers were merely asked to state their earnings during the previous month. Their earnings include returns to labour, entrepreneurship and, possibly, capital.

distinguish between migrants who have arrived in the city at different points in their life cycles. This variable can be interpreted as a crude proxy for pre-migration experience in the rural area or for qualities such as trainability, responsibility and job performance potential: qualities which may be associated with age. Marital status is usually interpreted as an index of stability—one of the attributes of productivity, and married workers are generally believed to have greater attachment to the labour market because of their family obligations. Caste and the set of region of origin dummy variables are measures of family and environmental background factors, but could represent the influence of structural factors as well. It is often claimed that members of the Scheduled castes (also referred to by many as Harijans or Untouchables) have poorer quality schooling and lower expectations than those who belong to the other castes (Béteille (1974, p. 65), Tilak (1979)). Similarly, migrants from particular regions may be associated with possessing greater motivation and drive, or other desirable qualities. On the other hand, in India contacts are important in the recruitment process, and several studies (e.g. TCPO (1975), Papola (1977)) have noted that persons of the same caste and from the same place of origin tend to be concentrated in particular establishments or occupational and industrial categories. Thus Scheduled caste members may find it difficult to penetrate established social networks, and the influence of these networks also may be reflected in the much broader grouping of region of origin that we have adopted.

The dummy variable indicating whether the job is manual or non-manual can be interpreted as a proxy for occupation, and has been included on the belief that it represents a more fundamental division of the labour market than occupation. It also enables us to test the hypothesis suggested by Friedmann and Sullivan (1974, p. 396), that the distinction between manual and non-manual workers is not important in the informal sector. A distinction is made between salaried workers and workers employed on a daily-wage basis, because some studies (e.g. Dasgupta (1976)) have noted that establishments, including those in the formal sector, often pay different rates for these two groups even when they perform the same job.

When an earnings function is estimated for all wage employees with a dummy variable indicating employment in the formal sector included among the explanatory variables (col. 2, Table 1), that coefficient is positive and significant at the one per cent level: *ceteris paribus* employment in the formal sector is associated with 8.9 per cent higher earnings than informal sector employment. Earnings functions estimated separately for the formal and informal wage sectors (cols 3 and 4) indicate that the wage determination process is different in the two sectors. The Chow test for the equality between sets of coefficients in the two regressions yields an F ratio of 4.44 (critical value: $F_{0.01} = 1.8$): the earnings functions for the two sectors are significantly different at the one per cent level. However, contrary to the assertions of the segmented labour market model, the differences do not involve human capital variables. The regression equation for the pooled

TABLE 1

Regression Analysis of Earnings of Wage Employees According to Sectors: Rural Migrants in Delhi, 1975–76

Sample	*Entire Sample*		*Formal Sector*	*Informal Sector*
Independent variable	*Coefficient (standard error)* (1)	*Coefficient (standard error)* (2)	*Coefficient (standard error)* (3)	*Coefficient (standard error)* (4)
Education dummies *a*				
Below primary	0·03137 (0.04169)	0.03209 (0.04149)	0.04556 (0.05035)	−0.00330 (0.07193)
Primary to below middle	0.04696 (0.03460)	0.04799 (0.03443)	0.01196 (0.04251)	0.08639 (0.05822)
Middle to below matric	0.14195 (0.03646)*	0.13977 (0.03629)*	0.12956 (0.04286)*	0.13605 (0.06680)†
Matric to below intermediate	0.22279 (0.04262)*	0.21275 (0.04251)*	0.18185 (0.04939)*	0.22050 (0.08133)*
Intermediate to below graduate	0.42277 (0.05986)*	0.39858 (0.05998)*	0.34196 (0.06507)*	0.34708 (0.16397)†
Graduate	0.72649 (0.06576)*	0.70502 (0.06574)*	0.68031 (0.07110)*	0.41781 (0.18442)†
Postgraduate	1.24401 (0.08042)*	1.21395 (0.08050)*	1.11841 (0.08204)*	*c*
Age on arrival	0.05039 (0.00803)*	0.04778 (0.00804)*	0.04671 (0.01092)*	0.04238 (0.01231)*
(Age on arrival)^2	−0.00077 (0.00013)*	−0.00073 (0.00013)*	−0.00069 (0.00018)*	−0.00070 (0.00020)*
Urban experience, in years	0.07013 (0.01180)*	0.06804 (0.01176)*	0.07479 (0.01431)*	0.05628 (0.02071)*
(Urban experience)^2	−0.00256 (0.00089)*	−0.00244 (0.00089)*	−0.00289 (0.00108)*	−0.00202 (0.00160)
Unmarried	−0.02314 (0.03578)	−0.02766 (0.03563)	−0.02165 (0.04341)	−0.06537 (0.06274)
Scheduled caste	−0.05690 (0.02624)†	−0.05910 (0.02612)†	−0.10438 (0.03059)*	0.00117 (0.04899)
Nonmanual worker	0.14751 (0.03500)*	0.15552 (0.03491)*	0.21839 (0.04104)*	0.04493 (0.06674)
Salaried worker	0.10680 (0.02747)*	0.08940 (0.02780)*	0.15242 (0.03571)*	0.01234 (0.04523)

Region of origin dummies *b*				
Haryana	0.12427 (0.05058)†	0.12732 (0.05034)†	0.11011 (0.05758)‡	0.15119 (0.09990)
Punjab	0.32449 (0.08646)*	0.33640 (0.08611)*	0.35498 (0.10668)*	0.29428 (0.14738)†
Rajasthan	−0.12184 (0.05759)†	−0.12247 (0.05732)†	−0.17559 (0.06826)*	0.00670 (0.10521)
Eastern Uttar Pradesh	−0.06689 (0.03789)‡	−0.06127 (0.03774)	−0.08923 (0.04494)*	−0.01174 (0.07029)
Hill Uttar Pradesh	0.07535 (0.05711)	0.06792 (0.05688)	0.06444 (0.06267)	0.00774 (0.12431)
Central Uttar Pradesh	0.08765 (0.07901)	0.09015 (0.07863)	0.03985 (0.09856)	0.19478 (0.14929)
Western Uttar Pradesh	0.07415 (0.04039)‡	0.07859 (0.04021)‡	0.08631 (0.04641)‡	0.07736 (0.07843)
Formal sector worker		0.08493 (0.02478)*		
Constant	4.34330 (0.13065)*	4.34181 (0.13001)*	4.38269 (0.17101)*	4.51322 (0.21024)*
R^2	0.53988	0.54478	0.62519	0.22072
$\bar{R}^2$	0.53061	0.53519	0.61391	0.17245
F	58.24069	56.76773	55.42364	4.57234
Residual sums of squares	148.78078	147.19555	90.72437	49.39889
(*N*)	(1,115)	(1,115)	(754)	(361)

Notes: *a* The omitted category was those with no education.
b The omitted category was those from "Rest of India."
c There was no postgraduate person in the informal sector.
* Significant at the 1 per cent level, using a two-tailed test.
† Significant at the 5 per cent level.
‡ Significant at the 10 per cent level.

sample containing a set of intercept and slope dummies representing the products of each of the basic independent variable and the dummy variable for formal sector employment (Table 2) shows that the coefficients on the education dummies, age on arrival, urban experience, marital status, and the region of origin dummies in the informal sector are not significantly different from comparable coefficients in the formal sector.

TABLE 2

Regression Analysis of Earnings Differentials Between the Formal and Informal Wage Sectors: Rural Migrants in Delhi, 1975–76

Independent Variable	(1)	*Formal Sector Interaction Terms a* (2)
Education dummies		
Below primary	−0.00330 (0.06819)*b*	0.04885 (0.08558)
Primary to below middle	0.08369 (0.05519)	−0.07173 (0.07038)
Middle to below matric	0.13605 (0.06332)†	−0.00649 (0.07713)
Matric to below intermediate	0.22050 (0.07710)*	−0.03865 (0.09229)
Intermediate to below graduate	0.34708 (0.15544)†	−0.00512 (0.16920)
Graduate	0.41781 (0.17483)†	0.26250 (0.18947)
Postgraduate	*c*	1.11841 (0.08427)*
Age on arrival	0.04238 (0.01167)*	0.00433 (0.01619)
(Age on arrival)^2	−0.00070 (0.00019)*	0.00002 (0.00027)
Urban experience	0.05628 (0.01963)*	0.01851 (0.02452)
(Urban experience)^2	−0.00202 (0.00151)	−0.00087 (0.00187)
Unmarried	−0.06537 (0.05948)	0.04372 (0.07434)
Scheduled caste	0.00117 (0.04645)	−0.10555 (0.05608)‡
Nonmanual worker	0.04493 (0.06327)	0.17399 (0.07603)†
Salaried worker	0.01234 (0.04288)	0.14007 (0.05643)†
Region of origin dummies		
Haryana	0.15119 (0.09471)	−0.04108 (0.11166)
Punjab	0.29428 (0.13971)†	0.06069 (0.17756)
Rajasthan	0.00670 (0.09974)	−0.18229 (0.12192)
Eastern Uttar Pradesh	−0.01174 (0.06664)	−0.07749 (0.08106)
Hill Uttar Pradesh	0.00774 (0.11784)	0.05671 (0.13428)
Central Uttar Pradesh	0.19478 (0.14152)	−0.15493 (0.16952)
Western Uttar Pradesh	0.07736 (0.07435)	0.00895 (0.08832)
Constant	4.51322 (0.19931)*	−0.13054 (0.26567)
R^2	0.56665	
$\bar{R}^2$	0.54883	
F	31.79913	
Residual sum of squares	140.12325	
(N)	(1,115)	

Notes: *a* These are the coefficients of the slope and intercept dummies representing employment in the formal sector.

b The figures in parentheses are standard errors.

c Not entered in the equation because there were no postgraduates in the informal sector.

* Significant at the 1 per cent level, using a two-tailed test.

† Significant at the 5 per cent level.

‡ Significant at the 10 per cent level.

In both the formal and informal wage sectors the relationship between education and earnings is non-linear (see Table 1). Completing middle school level education appears to be critical. Individuals who had dropped out before completing this level do not earn significantly more than those with no education (the omitted category). Beyond the middle school level, the earnings differential between successive stages of education increases with the level of education, indicating that the percentage increase in earnings from an additional year of education rises with additional education acquired. Both age on arrival (the proxy for pre-migration 'experience') and experience in the city have significant positive but diminishing effects on earnings, but as might be expected the effect of the latter variable is stronger.[8] The statistically significant relationship of urban experience with earnings in the informal sector suggests, contrary to the popular belief, that jobs in this sector involve on-the-job training. Another factor contributing to higher earnings with experience is that many firms paid their employees on a piece-rate basis. Under such a scheme inexperienced workers earn less, as their productivity is lower, and quality of work is inferior. A further reason suggested by Dore (1974, p. 1) is that long-service workers in the informal sector may be paid a loyalty premium by their employers.

The formal and the informal wage sectors differ mainly with respect to the effect on earnings of caste, employment status and the nature of work. In the informal sector, Scheduled caste migrants are not at a disadvantage, employers do not reward salaried workers and daily-wage workers differently, and, as hypothesized by Friedmann and Sullivan, the distinction between manual and non-manual workers is not significant. In contrast, in the formal sector, *ceteris paribus*, earnings are lower for the Scheduled castes, and higher for salaried workers and non-manual workers.

Determinants of sector of entry

Forty-three per cent of the migrants in the sample began their urban employment experience in the formal sector, 47 per cent in the informal wage sector, and 10 per cent in the non-wage sector. We now attempt to identify the factors which are empirically important in explaining the sector of entry, by estimating a multinomial logit model. The probability that an individual i characterized by the vector $x^i = (1, x_1^i, \ldots, x_h^i)$ of the independent variables will be found in the jth sector is given by

$$P_j^i = \exp \beta_j' x^i \Big/ \sum_k \exp \beta_k' x^i, \tag{1}$$

where β_k is the vector of h coefficients corresponding to the kth sector. In this model the natural logarithm of the odds of entering the jth sector

[8] The F-test based on constrained and unconstrained regressions indicates that the hypothesis on equality of the coefficients on age on arrival and urban experience is to be rejected.

instead of the kth sector is

$$\ln (P_j^i/P_k^i) = (\beta_j' - \beta_k')x^i; \tag{2}$$

and the change in the log of odds arising from an unit change in an explanatory variable is measured by

$$[\partial \ln (P_j^i/P_k^i)]\, \partial x_m^i = \beta_{jm} - \beta_{km}\,, \tag{3}$$

where m refers to the mth element of the vectors. The total number of parameters to be estimated when there are N sectors is $h(N-1)$, since coefficients for each element of x are determined only up to an arbitrary normalization.

The maximum likelihood estimates of the multinomial logit model based on observations for the entire sample are presented in cols 1 and 2 of Table 3. In the estimated model we have set the coefficients for non-wage workers to zero for the purpose of normalization. Thus the estimated coefficients for formal and informal wage sectors indicate the change in the log of odds of entering these two sectors respectively instead of the non-wage sector. By subtracting the comparable coefficients we can also observe the change in the log of odds of entering the formal sector instead of the informal wage sector. To determine if the differences in comparable coefficients for the formal and informal wage sectors are statistically significant we estimate a binary logit model for wage employees only explaining the probability of entering the formal sector. The estimates for this model are presented in col. 3 of Table 3.

The coefficients on the education dummies indicate that the probability of entering the formal sector is considerably improved if migrants have completed their matriculation and that it increases as education rises beyond this level. In the equation for the informal wage sector (col. 2) the only statistically significant education dummy, at the 10 per cent level, is that on the below primary school level. This indicates that apart from this education category, education is not important in determining which migrants take up wage rather than non-wage employment in the informal sector.

The probability of entering wage employment is higher for those who come to the city before attaining the age of 25. Once this threshold is crossed the probability of entering wage employment decreases as age on arrival increases. This is indicated by the negative and significant coefficients for both formal and informal wage sector workers on the three dummy variables representing age of 25 and more. This pattern is partly a reflection of the existence of upper age limits for entering many jobs in the wage sector, particularly in the government and public enterprises. The binary logit model (col. 3) indicates that among those who enter wage employment the likelihood of entering the formal sector is greater only for those who are between 20 and 24 years of age at time of arrival in the city.

The evidence indicates that migrants belonging to the Scheduled castes are more likely to enter wage employment rather than non-wage employ-

ment, and that those from Haryana and western Uttar Pradesh are less likely than migrants from other areas to enter wage employment. These findings are a reflection of the importance of social networks in determining the sector of entry, but they do not highlight it as strikingly as the responses of the migrants on how they obtained their first job. Entrants to all sectors indicated that they relied heavily on friends and relatives in obtaining employment: 64 per cent of the formal sector entrants, 74 per cent of the informal wage sector entrants, and 66 per cent of the non-wage workers located their first job through contacts.

Attitude towards the informal sector at time of entry

Seventy-one per cent of those who were absorbed in non-wage employment on arrival stated during the survey that they had come to the city with the specific intention of pursuing non-wage activity. The issue about the objectives of those who entered the informal wage sector cannot be resolved as easily, as the survey did not collect information on the type and size of establishments that migrants expected to join. However, some insight can be obtained from estimates of the prevalence of moving to the city with job prospects made certain from the rural area, and of job search after entering the informal wage sector.

Of those who entered the informal wage sector, 12 per cent had prearranged their urban jobs (in the sense that they had received *firm commitment* of employment from the *employer*), and 42 per cent had migrated on the suggestions of urban-based contacts.[9] For all practical purposes informal wage sector entrants who received suggestions from urban contacts have no uncertainty in their minds of getting a job in this sector on arrival at the urban centre. The survey data indicate that because of the responsibilities incurred, urban-based contacts are not likely to make suggestions until they have lined up specific jobs for their candidates or are sure of doing so.[10] Moreover, the ability of contacts to locate jobs for others outside their own sector is likely to be limited. Contacts have most influence with their own employers, and they are most knowledgeable about vacancies in their own occupations and establishments.

It can be argued that the evidence that many migrants expected to enter the informal wage sector and acquired such jobs through contacts does not establish that these migrants did not move to the city to engage in job search there. For it may be that they simply expected to start lower down the job ladder. However, the survey data suggest that this was not so. If informal sector entrants considered their job as a holding operation they would be looking for alternative employment. The continuation of job search after taking up first job was more prevalent among those who entered the

[9] These two categories of migrants overlap. In all, 48 per cent of the informal wage sector entrants had pre-arranged job and/or moved on the suggestion of a contact.

[10] This point is discussed in detail in Banerjee (1983).

TABLE 3
Coefficients and Asymptotic Standard Errors for the Logit Model of Sector of Entry

Sample	*Entire Sample*		*Wage Employees Only*
Model	*Multinomial logit*		*Binary logit*
Dependent Variable	*Log of odds, relative to nonwage employment, of entering*		*Log of odds, relative to informal wage sector, of entering*
Independent Variable	*Formal sector* (1)	*Informal wage sector* (2)	*Formal sector* (3)
Education dummies *a*			
Below primary	0.68372 (0.38716)‡	0.67388 (0.38239)‡	0.00082 (0.20927)
Primary to below middle	0.45733 (0.31590)	0.45889 (0.31047)	0.00247 (0.17743)
Middle to below matric	0.09311 (0.30135)	0.12904 (0.29574)	−0.03911 (0.18871)
Matric to below intermediate	1.17067 (0.38819)*	0.64123 (0.39237)	0.52377 (0.20930)†
Intermediate to below graduate	1.29299 (0.52135)†	−0.02538 (0.57015)	1.31740 (0.34278)*
Graduate and above	1.80902 (0.52292)*	−0.60357 (0.65033)	2.39970 (0.44729)*
Age on arrival dummies *b*			
20 to 24	−0.08221 (0.30293)	−0.41551 (0.30102)	0.32413 (0.15157)†
25 to 29	−0.70302 (0.35333)†	−0.76822 (0.35145)†	0.06095 (0.20316)
30 to 39	−1.51930 (0.36651)*	−1.41810 (0.36047)*	−0.08006 (0.23932)
40 and above	−1.83313 (0.42319)*	−1.96843 (0.42709)*	0.10406 (0.32893)
Years of urban residence	−0.02804 (0.02343)	−0.01342 (0.02173)	−0.01531 (0.01875)
Unmarried	−0.37837 (0.27247)	0.09499 (0.27087)	−0.46736 (0.14417)*
Scheduled caste	0.67645 (0.26011)*	0.66130 (0.25871)†	0.00875 (0.14326)

Region of origin dummies *c*			
Haryana	−1.62104 (0.42605)*	−1.56042 (0.42809)*	−0.09118 (0.27168)
Punjab	−0.29402 (0.85742)	0.25879 (0.83485)	−0.56604 (0.43723)
Rajasthan	−0.11525 (0.64528)	−0.00671 (0.64415)	−0.08566 (0.30287)
Eastern Uttar Pradesh	−0.40244 (0.39613)	0.01713 (0.39304)	−0.43235 (0.19654)†
Hill Uttar Pradesh	0.90032 (0.79943)	1.00877 (0.79456)	−0.12011 (0.27735)
Central Uttar Pradesh	−0.61682 (0.72589)	−0.78251 (0.73526)	0.14513 (0.41979)
Western Uttar Pradesh	−1.05464 (0.37723)*	−1.07266 (0.37774)*	0.00273 (0.21004)
Constant	2.40124 (0.49252)*	2.35588 (0.48818)	0.06465 (0.26082)
Log likelihood	−1,197.17		−806.01
Likelihood ratio test	251.61		128.94
Degrees of freedom	41		20
(*N*)	(1,396)		(1,257)

Notes: *a* The omitted category was those with no education.
b The omitted category was those less than 19 years of age.
c The omitted category was those from "Rest of India."
* Significant at the 1 per cent level, using a two-tailed test.
† Significant at the 5 per cent level.
‡ Significant at the 10 per cent level.

informal wage sector, but the majority of migrants entering this sector did not search. Forty-one per cent of those who entered the informal wage sector continued job search, compared to 21 per cent and 20 per cent of those who entered the formal sector and non-wage employment respectively. Thus, it can be claimed with some confidence that a sizeable proportion, possibly one-half or more, of migrants who entered the informal wage sector and the non-wage sector had been attracted to the city by opportunities in these sectors, and did not consider employment there as a means of survival while waiting in the queue for formal sector jobs.

Mobility from the informal sector to the formal sector

Only 24 per cent of those who entered the informal wage sector on arrival and 6 per cent of the non-wage workers had found their way into the formal sector by the time of the survey. These figures represent the average experience of a large number of cohorts over varying periods of time. Thus they are not adequate measures of the degree of mobility, though the mobility from the non-wage sector is obviously on the low side. To overcome this deficiency, we suggested a comparison of the proportion of direct entrants in the formal sector in any particular year with the proportion of informal sector entrants in the previous year who moved to the formal sector within twelve months of arrival.

The results of such an exercise are presented in Table 4. The table shows that for migrants who entered the informal wage sector, the percentage who moved to the formal sector within twelve months of arrival was between 5 per cent and 15 per cent (col. 3). This was considerably lower than the percentage of all new arrivals and of those with no education who entered the formal sector directly. The percentage who had entered the formal sector directly varied from 38 per cent to 48 per cent for the entire sample (col. 1), and from 26 per cent to 46 per cent for migrants with no education (col. 2).[11] To give a specific example, of those migrants who had entered the informal wage sector in 1966, only 7.1 per cent had moved to the formal sector within twelve months of their arrival. But in 1967, 46.2 per cent of all new arrivals and 25.8 per cent of new arrivals with no education entered the formal sector directly. Thus in 1967 new arrivals were at least four to six times more likely to get formal sector employment than those who entered the informal wage sector in 1966. This suggests, in contrast to the assumption of probabilistic migration models, that the migrant labour market in Delhi is segmented.

It can be argued that in the context of Delhi the above criterion for

[11] The percentage of direct formal sector entrants in any particular year has been calculated with respect to those who had arrived in the city that year and were living there at the time of the survey. This neglects those who had come in that year and had returned to their origin. To the extent these return migrants had entered the urban informal sector, the figures on direct formal sector entry are overestimates. But then, so also are the figures on mobility from the informal sector to the formal sector.

TABLE 4

Direct Entry into the Formal Sector and Mobility from the Informal Sector, by Year of Arrival in Delhi

Year of arrival	*Percentage of migrants who entered the formal sector directly* (1)	*Percentage of migrants with no education who entered the formal sector directly* (2)	*For those who entered the informal wage sector, the percentage who moved to the formal sector within 12 months of arrival* (3)	*For those who entered the informal wage sector, the percentage who were in the formal sector at the time of the survey* (1975–76) (4)
1965	37.8	25.8	5.9	29.4
1966	44.3	32.0	7.1	31.0
1967	46.2	25.8	10.4	33.3
1968	45.4	43.9	4.8	20.6
1969	45.9	45.5	14.6	31.3
1970	43.9	29.5	11.6	30.4
1971	42.9	52.3	8.7	26.1
1972	41.8	37.2	12.5	20.8
1973	49.5	38.5	9.8	22.0
1974	40.5	35.7	14.3	16.7
1975	46.2	37.9	3.9 *a*	3.9

Note: *a* This figure is low because many of the new arrivals in 1975 had not completed 12 months of urban residence at the time of the survey.

judging segmentation is too stringent. Limiting the reference period to twelve months would be appropriate if job search was entirely urban based. But the survey data indicate that over one-half of the direct entrants to the formal sector had engaged in rural-based search. Therefore the reference period for measuring mobility from the informal sector ought to match the average length of rural-based search of formal sector entrants. Unfortunately, we are unable to do this as information on length of rural-based search was not collected in the survey. However, a consideration of mobility measured over a longer period (see col. 4) and the econometric evidence reported below on the influence of length of urban residence suggests that the conclusion of segmentation is still valid.

We now estimate the factors that contributed to mobility from the informal wage sector to the formal sector by estimating a binary logit model. The estimates, obtained by the maximum likelihood method, are presented in Table 5. The results indicate, contrary to the assertion of the segmentation model, that education has an important influence on mobility. In particular, having middle school- or intermediate college-level education increases the likelihood of mobility. However, age on arrival does not have any significant effect. Thus, the advantage that migrants who arrive between the age of 20 and 24 have over other age groups in gaining direct access to the formal sector is lost once they enter the informal wage sector.

As might be expected, the likelihood of mobility increases with duration of urban residence. *Ceteris paribus*, an additional year spent in the city increases the probability of an informal wage sector employee moving to the formal sector by 0.02, when evaluated at the aggregate predicted probability for mean values of the explanatory variables ($p = 0.18$).

The finding on the unmarried worker dummy is similar to that obtained in the model of sector of entry restricted to wage employees. This suggests that formal sector employers perhaps prefer to hire married workers or that informal sector employment is less acceptable to married than to unmarried workers. The evidence suggests that Scheduled caste migrants are more likely to move out of the informal wage sector to the formal sector than those who belong to other castes, reflecting their awareness and exploitation of the advantage they have from the government policy of reserving jobs for Scheduled castes.[12]

As for *potential mobility* from the informal sector to the formal sector, the probability appears to be low. At the time of the survey, only 15 per cent of the informal sector wage employees and 12 per cent of the non-wage workers were actively searching for alternative wage employment.

The lack of mobility from the non-wage sector and the lack of interest of non-wage workers in wage employment is not surprising given that the average monthly earnings of these workers were 47 per cent higher than

[12] For a detailed analysis of the influence of caste in the urban labour market see Banerjee and Knight (1982).

TABLE 5
Logit Estimates of Mobility Between Sectors (Dependent variable: log of odds of moving to the formal sector from the informal wage sector)

Independent Variable	*Coefficient (Asymptotic standard error)*
Education dummies *a*	
Below primary	−0.06823 (0.34667)
Primary to below middle	−0.18347 (0.28831)
Middle to below matric	0.56045 (0.29552)†
Matric to below intermediate	0.43083 (0.35694)
Intermediate to below graduate	2.10030 (0.62826)*
Graduate and above	−25.71200 (237.00×10^3)*b*
Age on arrival dummies *a*	
20 to 24	0.11364 (0.25274)
25 to 29	0.33029 (0.32886)
30 to 39	0.13475 (0.38893)
40 and above	−0.19849 (0.68002)
Years of urban residence	0.14667 (0.03044)*
Unmarried	−0.42204 (0.22976)†
Scheduled caste	0.44327 (0.23079)†
Region of origin dummies *a*	
Haryana	−0.34077 (0.45692)
Punjab	−1.59160 (0.85051)†
Rajasthan	−0.43204 (0.51791)
Eastern Uttar Pradesh	0.09134 (0.33322)
Hill Uttar Pradesh	0.51610 (0.44980)
Central Uttar Pradesh	0.15181 (0.74723)
Western Uttar Pradesh	−1.06220 (0.39815)*
Constant	−2.04740 (0.44978)*
Log likelihood	−323.04
Likelihood ratio test	63.51
Degrees of freedom	20
(*N*)	(646)
Predicted probability at mean values of independent variables	0.18

Notes: *a* The omitted categories were the same as those indicated in Table 3.
b There were very few observations in this education category, which has affected the size and reliability of the coefficient.
* Significant at the 1 per cent level, using a two-tailed test.
† Significant at the 10 per cent level.

those of workers in the formal sector. One reason for the low propensity of workers in the informal wage sector to seek alternative employment may be that the wage differential with the formal sector is not large enough to make it worthwhile to bother looking for formal sector employment. The informal sector migrants may currently be working together with their relatives and co-villagers, and may not like to sacrifice this working environment to seek employment elsewhere for slightly higher pay. Further, the cumulative loss from being in the informal sector rather than in the formal sector is minimal

since education and experience are rewarded at similar rates in both sectors.[13] Another, and perhaps more important, reason may be that there are constraints on obtaining specific information and gaining access to formal sector employment. If information on formal sector opportunities is generally transmitted through contacts, informal sector employees will come to know of them only if they are able to widen their contacts after arrival. The widening of contacts is not easy, and is largely a matter of chance. The urban social network is based on kinship, caste membership, area of origin, and place of work. When jobs are scarce, social groups are likely to accommodate their own members first. An alternative way to obtain information would be to search personally at factory gates. But this search would have to be carried out during working hours, and may require giving up the current job. This option is therefore quite risky, and may not be preferred by many individuals. An additional consideration in rejecting this option may be the belief that jobs cannot be obtained without the influence of contacts. This belief may also inhibit individuals from searching for formal sector jobs through newspaper advertisement and employment exchange. Thus, migrants may not search because they do not know of any jobs that are available, or because they know that what is available cannot be obtained. The presence of contacts plays a crucial role in both these considerations. The role of contacts in mobility between sectors in Delhi is highlighted by individual level data: of those migrants in the sample who had moved from the informal wage sector to the formal sector, about 60 per cent came to know about their current employment from relatives and friends.

The above discussion suggests a reason why the proportion of new arrivals entering the formal sector was greater than the proportion of informal wage sector workers moving to the formal sector. Informal sector wage employees were not aware of the formal sector vacancies which the new arrivals filled. Only if there was a perfect market mechanism for transmission of information would all persons have an equal chance to search.

IV. Conclusions

A basic hypothesis of probabilistic migration models is that informal sector employment is a temporary staging post for new migrants on their way to formal sector employment. In this paper we have argued that there are no conclusive tests of probabilistic models in the empirical migration literature, and we then went on to examine evidence from a sample survey which tests the validity of the assumptions that underlie such models. We also tested some of the main hypotheses of the segmented labour market theory, a popular alternative to neo-classical theory for analyzing the

[13] The superiority of the formal sector must not be gauged in terms of earnings differentials alone. This sector is likely to have greater non-pecuniary benefits and better terms and conditions of work than the informal sector.

structure of urban labour markets in developing countries. The empirical evidence indicates that the migration process postulated in probabilistic models does not seem to be realistic in the case of Delhi, and that the segmentation model is only partially valid.

Slightly more than one-half of the migrants in the sample joined the informal sector on arrival in Delhi, but only a small fraction entered non-wage employment. Not all informal sector entrants saw their job as a means of financing search for formal sector employment. A substantial proportion of informal sector entrants were attracted to Delhi by opportunities in the informal sector. About one-half of the informal wage sector entrants moved to Delhi after prearranging their job or on the suggestion of an urban-based contact, and nearly three-quarters of the non-wage sector entrants expected to set up such activities on arrival in the city. Only two-fifths of the informal wage sector entrants and one-fifth of the non-wage workers continued to search for alternative employment after finding their first job. The survey data also suggest that a majority of formal sector entrants too had engaged in rural-based search and had lined up their jobs from the rural area. These findings do not lend support to the basic assumptions of probabilistic migration models.

Actual mobility and potential mobility from the informal sector was low. Slightly less than one-quarter of informal wage sector entrants were able to move to the formal sector. The proportion who moved from the informal wage sector to the formal sector during any twelve month period was four to six times lower than the proportion of all new arrivals and of those with no education during that period who entered the formal sector directly. Moreover, only a small proportion of informal sector wage employees were seeking alternative jobs at the time of the survey. This was interpreted as evidence of a segmented labour market, and was attributed in part to imperfect information flows, resulting from the importance of contacts in the recruitment process. Individual level data indicate that friends and relatives were heavily relied on to obtain employment by entrants to all sectors and by those who moved from the informal wage sector to the formal sector. Moreover, the dummy variables on region of origin, included as proxies for the influence of contacts, were statistically significant in the econometric analysis of earnings, sector of entry, and mobility between sectors.

An analysis of earnings of wage employees suggest that a meaningful distinction could be made between the formal sector and the informal wage sector. Earnings were lower in the informal wage sector and the process of wage determination in this sector differed from that in the formal sector. But, contrary to the assertion of the segmented labour market model, returns to education and experience were similar to both sectors. The differences observed were in the effect of employment status, nature of work, and caste on earnings. In the formal sector daily-wage workers, manual workers, and individuals belonging to the Scheduled castes had lower earnings, but there was no such discrimination in the informal sector.

This suggests that the informal sector was, as might be expected, more competitive.

Informal sector entrants were, on the average, slightly less well educated than those who entered the formal sector, and the likelihood of moving from the informal to the formal sector was greater for those who had above middle school level education. The latter finding goes against the hypothesis of the segmentation model that human capital is not important in explaining mobility between sectors. However, this should not detract attention from the fact that over one-third of those with no education entered the formal sector directly on arrival in the city, and that the likelihood of uneducated informal sector entrants moving to the formal sector was small. The probability of mobility increased with duration of urban residence but only by a small magnitude, and it was higher for married migrants and those who belonged to the Scheduled castes.

The findings of this paper have important implications. The implication of the rejection of probabilistic models for policy decisions is that employment creation in the urban formal sector can play a part in the solution of the urban 'employment problem', and that the contribution of migration to urban surplus labour and social costs is much less than is usually visualized. The importance of pre-arranging jobs and moving on the suggestion of contacts suggest that migration in response to job creation in the formal sector is not likely to exceed the number of openings by a large margin. Only those who have contacts in the formal sector and also have the necessary qualifications will receive information about new opportunities and stand some chance of obtaining employment. If jobs are created in establishments and occupations dominated by urban natives, induced migration will be particularly low. The findings also suggest that for migrants attracted to the city by informal sector opportunities, labour market segmentation is not a constraint on the achievement of their objectives formed at the time of migration. There is no reduction in the perceived increase in welfare through migration, arising out of segmentation of the market. Individuals in the informal sector are better off in the city than they were in the rural area, though their position could be even better if there was no segmentation. Further, the importance of education and experience in the determination of earnings of wage employees in the informal sector suggests that low earnings in this sector can be eliminated through human capital formation.

International Monetary Fund,
Washington, D.C. 20431

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