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Socio-economic Determinants of Labour Mobility in Pakistan

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Why do factors of production, especially the labour, migrate from one region or sector to another? This question, which remains fundamental to economic and human resource development, has been a major topic among researchers. While considerable progress has been made in developing a theoretical model of migration, the empirical verification of this model using individual level data has remained unresolved. With the availability of Population, Labour Force, and Migration (PLM) Survey data, this paper attempts to develop a model of internal migration in Pakistan, to serve as a guiding paradigm to write down a model for meaningful estimation. Keeping in line with the literature, three types of variables have been identified as the possible determinants of migration. These variables relate to the possession of human capital, commitment to job and place of residence, and cost-related factors. After controlling for other variables, it was observed that, in general, migrants were selective especially in terms of age, education, and choice of occupation. These findings are consistent with the evidence from other developing countries.

I. INTRODUCTION

Why do factors of production, especially the labour, migrate from one region to another? This question, which remains fundamental to economic and human resource development, was comprehensively analysed by Ravenstein about a century ago.[1] Ever since, the issue of migration has been a major topic among researchers.[2] Earlier studies on this issue reflect the aggregative behaviour of the society where a two-sector economy is assumed. The regions or sectors are identified on the basis of the differences in non-human resources. These differences, in turn, reduce relative productivity of certain factors to the extent that their use, on the margin, in one of the regions becomes economically inefficient. This forces these factors of production, especially labour, to migrate to areas where the returns are higher. This adjustment continues until the economy attains "equilibrium".

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[1]See 'The Laws of Migration' by Ravenstein (1885, 1889).

[2]Several survey articles have reviewed studies on internal and international migration. Some of them are: Greenwood (1975, 1985); Todaro (1980); Yap (1976) and Brigg (1973).

Migration of labour in this scenario is considered as an equilibrating mechanism.[3,4]

Besides these macro considerations, Sjaastad (1962) provided the micro foundations for the theory of migration. In this context, migration takes place as a result of rational behaviour at the individual level. Individuals who seek to maximise their lifetime utility calculate net benefits of migration. Movement takes place only if the expected gains outweigh the returns at the origin and migration costs. *Migration in this scenario is perceived as an investment in human capital which results in higher expected benefits.*

An integration of the micro theory of migration and the general equilibrium model of development was not possible until the seminal work of Todaro (1969); Harris and Todaro (1970), and its subsequent extensions and refinements.[5] This model resolves the apparent conflict between immigration in the presence of urban unemployment and underemployment by advancing the *expected income hypothesis* whereby prospective migrants respond to expected rather than actual difference in rural-urban wages. The expected gains in this case depend not only on the difference in earnings in the two regions, but also on the probability of getting a job at the destination.

Although the original Harris-Todaro Model and its extensions bring the issue of migration closer to reality, an important aspect which remains unresolved is the empirical verification of this model. Using aggregate data mainly from censuses, various authors have tried to find the crucial determinants of the rate of migration flows between two points.[6] Invariably, the level of urbanisation, the distance between the areas of origin and destination, the level of unemployment at the destination, etc., have been found to be the main push or pull factors.

While these macro-level studies provide a valuable insight for policy analyses, they fail to take into account the heterogeneity of population, which is crucial in explaining the phenomenon of *reverse migration* from *attractive* regions [Robinson and Tomes (1982)]. In this regard, the use of individual level data is conceptually more appropriate to test the theory of individual migration.[7]

With the availability of household level data from the Population, Labour Force and Migration (PLM) Survey, the objective of the present paper is to develop

[3]The noteworthy contributions in this regard are: Lewis (1954) and Fei and Ranis (1961).

[4]Along with the relative productivity argument, it is argued that migration at the aggregate level also takes place due to distorting agricultural policies in developing countries [Montgomery (1987)] and spatial inequalities due to modernisation [Zelinsky (1971)].

[5]Valuable extensions to the Harris-Todaro Model have been made by Stiglitz (1974); Cordon and Findlay (1975); Fields (1975); Khan (1979, 1980) and Cole and Sanders (1985).

[6]For details, see Greenwood (1975); Knowles and Anker (1975); Yap (1976) and Barkley (1991).

[7]Based on household level data, the earlier empirical evidence from Pakistan includes studies by Irfan *et al.* (1983); Irfan (1986) and Nabi (1984).

a theoretical framework that could be used for empirical verification of the human capital model of internal migration. Three types of variables, namely, the possession of human capital, commitment to job and place of residence, and cost-related variables, will be identified as the possible sources of individual migration in Pakistan.[8] The dichotomous nature of the dependent variable allows us to estimate the migration decision rule by the maximum likelihood probit estimation technique.[9]

The paper is arranged as follows.

The review, estimation, and discussion are divided into five sections. Section II describes the data and the model. Testable hypotheses and the operational model will be formalised in Section III. The results of estimation and the discussion are presented in Section IV. Finally, the last section summarises the conclusions.

II. THE DATA AND THE MODEL

(a) The Data

The household data set used in this study is based on a nationwide survey of Pakistan known as the "Population, Labour Force and Migration (PLM) Survey", conducted in 1979-80. The PLM Survey was based on a random sample of 11, 300 households. For each household, the survey recorded information on income, expenditure, labour force participation, migration, and fertility history. The head of the household or any other responsible person in the house (usually a man) completed the questionnaires related to migration, labour force, and income and expenditure; while women between the ages 13 and 49 completed the fertility-related questionnaire.

The migration questionnaire contained information about personal characteristics of all members of the house. This module classified household members as non-migrants, out-migrants, in-migrants, return migrants, or potential migrants. [10,11] The migration module also documented data about various socioeconomic and demographic variables related to each household member. The variables included were: age, sex, marital status, education, migration status, year of migration, place of residence, etc.

[8]A similar categorisation of variables could be found in Lee (1985).

[9]Alternative estimation procedures, such as the logit model, could also have been used for this purpose and the results could be made comparable by adjusting the estimated coefficients. [Maddala (1983), p. 23].

[10]Any person who was not born at the place of interview but had migrated and lived at that place since December 1971 was classified as in-migrant. Similarly, all persons who originally left the place of interview but returned after December 1971 were considered return-migrants. While potential migrants showed their willingness to move sometime in the future, out-migrants were those who had already migrated from the place of interview.

[11]In the empirical work that follows, potential migrants are classified as non-migrants, while migrant's category includes both in- and return-migrants.

For the analysis in this paper, information from all four modules of the PLM Survey was combined. However, certain restrictions had to be imposed on the data so that the resulting sample should be complete and consistent for each migrating family. These restrictions, discussed in Ahmed (1991), reduced the sample to 5186 households which included 480 migrants.[12,13]

(b) Theoretical Specification of the Model

The process of migration can be approached in different ways, such as through socioeconomic characteristics, spatial factors, or through cost-benefit calculations. However, Sirageldin *et al.* (1984) suggest that, if adequately specified, a general subjective cost-benefit framework may subsume these different processes of migration.

Following Sjaastad (1962), migration in the present paper is treated as an investment in human capital. This means that the potential migrant calculates the stream of benefits that would result from the move and compares them with the costs of migration. In other words, such a person seeks to maximise the present value of net gains resulting from the change in location. The objective function in this case not only includes an income or wage differential term, but also has an explicit treatment for costs. Thus, if the present discounted value (PDV) of the income earned by the i^{th} individual in place of origin 'n' is denoted by 'Y_{ni}', the PDV of the income earned at the destination is given by 'Y_{mi}', and if the permanent income equivalent of the cost of moving from place n to m is denoted by 'C_i', then the move takes place if

$$(Y_{mi} - Y_{ni}) \geq C_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.1)$$

where C_i is not only influenced by the personal characteristics of the i^{th} individual (Z_i), these costs are also affected by certain attributes of the original location (W_i). Thus, the cost function takes the form:

$$C_i = C(Z_i, W_i) + \eta_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.2)$$

where η_i is the non-stochastic disturbance term associated with costs.

Migration Decision Rule

Given expressions (2.1) and (2.2), the *structural form* of the migration decision rule can be generated as a linear combination of income or wage differential

[12]The migrant in this case is the head of the household.

[13]The current sample does not include women who migrated due to marriage.

and the variables which influence the cost function, i.e.,

$$I_i^* \equiv Ln \left[\frac{Y_{mi}}{Y_{ni}(1+c_i)} \right] \equiv LnY_{mi} - LnY_{ni} - LnC_i \quad \ldots \quad \ldots \quad (2.3)$$

where *Ln* stands for natural logarithm and $c_i = C_i/Y_{ni}$. Hence the selection criterion becomes:

$$\begin{aligned} Prob\ (Migrate) &= Prob\ (I^*_i > 0) \\ Prob\ (Stay) &= Prob\ (I^*_i \leq 0) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.4) \end{aligned}$$

There are two problems with a straightforward estimation of the structural form decision rule (2.3). First, it contains unobservable latent variable I^*_i. Instead, what we observe is:

$$I_i = 1 \text{ if } I^*_i > 0$$

$$I_i = 0 \text{ if } I^*_i < 0 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.5)$$

Second, the cross-section nature of the data suggests that the earnings of migrants and non-migrants are conditional on the values taken by I_i, i.e.,

$$Y_i = Y_{mi} \text{ if } I_i = 1$$

$$Y_i = Y_{ni} \text{ if } I_i = 0 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.6)$$

where potential earnings are not influenced by observable personal characteristics only, but that cost-related factors also influence them. Incorporating these determinants, the resulting *reduced form* migration decision rule becomes:

$$I^*_i = X_i\theta + \varepsilon_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.7)$$

where $X_i = [Z_i, W_i]$ and ε_i includes the random disturbance terms associated with the cost and earning functions.

From relations (2.5) to (2.7), we can derive the probability function as:

$$\begin{aligned} Prob\ (I_i = 1) &= Prob\ (\varepsilon_i > -X_i\theta) \\ &= 1 - F\ (-X_i\theta) \quad \ldots \quad \ldots \quad \ldots \quad (2.8) \end{aligned}$$

where $F(.)$ is the cumulative distribution function of ε_i. The likelihood function in this case will be:

$$L = \prod_{I_i=0} F(-X_i\theta) \prod_{I_i=1} [1 - F(-X_i\theta)] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2.9)$$

Since the probit model assumes $\varepsilon_i \sim N(0, \sigma^2)$, therefore the cumulative function takes the following form:

$$F(-X_i\theta) = \int_{-\infty}^{-X_i\theta/\sigma} \frac{1}{(2\pi)^{1/2}} \exp\left(-\frac{t^2}{2}\right)dt \quad \ldots \quad \ldots \quad \ldots \quad (2.10)$$

III. OPERATIONAL MODEL AND TESTABLE HYPOTHESES

The general model specified above can be used as a guiding paradigm as it enables us to write down a model which lends itself to a meaningful estimation. Based on the theoretical rationale, the *operational* model contains variables that are supported by the data. Different economic and community level variables are examined below; these are either direct measures of gains and costs or near approximations. The justification for their inclusion in the migration decision rule and the expected signs which they could carry are also discussed.

Education

One of the important factors that induces any person to migrate is one's level of education. The theory predicts that education not only reduces the costs of retrieving information, it also acts as a *signalling device* which increases the likelihood of securing employment at the destination.[14] This variable also measures skill and efficiency. As a component of personal characteristics and, therefore, a determinant of income, education of husband and of wife are included as separate explanatory variables. It is expected that both these variables will have positive effect on the migration decision. However, in a traditional society like Pakistan, where women constitute a small fraction of total labour force, husband's education in terms of migration is expected to be a relatively more important determinant of migration.

Literacy

There is no doubt that mass media exposure is a significant source of infor-

[14]See Levy and Wadycki (1972); Nabi (1984) and Sirageldin *et al.* (1984).

mation, and one would expect that educated people have more access to opportunities as compared to those who are illiterate. The inclusion of this variable in the model is based on the fact that the majority of the population in Pakistan, and especially in the rural areas, is either illiterate or possesses very elementary skills of reading or writing.[15] Although both literacy and education are expected to behave in a similar fashion, we will use one of these variables due to anticipated collinearity problem.

Age

Age indicates the likely number of working years. Since young workers have a longer working time horizon, they have greater flexibility to move and adjust their earnings over time. Age is also indicative of the higher opportunity cost of moving as older people are relatively more established and have better social status as compared to younger people. It is, therefore, expected that the relationship between age and migration decision will be negative. Age is important in yet another respect. This variable interacts with education and family size.

In order to test for the non-linearity of the age-migration profile, the square of age will also be used. If age turns out to be positive and its squared term appears with a negative sign, and both the estimated coefficients are statistically significant, then it will suggest that the propensity to migrate decreases with age.

Employment Status

Employment status in the area of origin is crucial for the possibility of moving. Those who are self-employed, either in agriculture or in business, are less likely to migrate as compared to those who are either unemployed or who work for private or public agencies and have the fear of transfer. Since readjustment of self-employed workers is costly, we expect a negative relationship between employment status (self-employment) and migration decision.

Family Type

Family type in the present model represents another possible source of the cost of migration. It is argued that those who live in a nuclear family have a weaker incentive to migrate as compared to those who live in extended families. This is because the migrating households usually leave their families with their close kins, at least for some time, which reduces the immediate cost of moving.

[15]The literacy rate, according to the 1981 census in Pakistan, is 26.2 percent. While for the urban areas this figure is 47.1 percent, in the rural areas the literacy rate is only 17.3 percent. The level of literacy is alarmingly low among the rural female population, where only 7.3 percent women are literate [Rukanuddin and Farooqui (1988)].

Schooling of Children

As an important component of W_i, the greater the number of children going to school, the greater will be the cost of relocation. Thus, a negative relationship between the number of children going to school and migration is anticipated.

Ownership of Land and House

These two variables allow for a permanent income and wealth concept in the model. Among other things, the decision to migrate is also influenced by the availability and cost of housing in the place of destination. Due to these reasons, we expect an inverse relationship between ownership of property and household's decision about migration.

Apart from the above-stated variables, certain other factors that are expected to influence the migration decision are: the place of residence, ownership of assets other than immoveable property, wife's labour force participation, and availability of infrastructure in the source and destination areas. Some of these variables will be included in the final specification of the model.

Based on the description of variables and testable hypotheses, the *operational model* for estimation can be formulated as:

$$
\begin{array}{l}
I = f\,[\,AMH,\ AMHSQ,\ EDH,\ EDW,\ OCUPH,\ HSTAT,\ LANDD,\\
\quad\ (-/+)\quad (-)\quad (+)\quad (+)\quad (+/-)\quad (-)\quad (-)\\
\quad ESH,\ LFPw,\ FTYPE,\ CH5ST,\ URDUM,\ PRDUM]\\
\quad\ (-)\quad (+/?)\quad (+)\quad (-)\quad (-)\quad (-)
\end{array}
$$

where the symbols are defined as below:

I	=	dummy variable taking a value of 1 for migrants, and zero otherwise.
AMH	=	age of husband in complete years.
AMHSQ	=	age of husband squared.
EDH	=	husband's years of schooling.
EDW	=	wife's years of schooling.
OCUPH	=	dummy variable taking a value of 1 if husband belongs to one of the occupational categories, and zero otherwise.
ESH	=	dummy variable taking a value of 1 if husband is self-employed, and zero otherwise.
LFPw	=	dummy variable taking a value of 1 if wife is in labour force, and zero otherwise.
HSTAT	=	dummy variable taking a value of 1 if a house is owned, and zero if it is rented.

LANDD = dummy variable taking a value of 1 if land is possessed, and zero otherwise.

FTYPE = dummy variable taking a value of 1 if the migrant belongs to a nuclear family, and zero otherwise.

CH5ST = number of children between ages five and nine going to school.

URDUM = dummy variable taking a value of 1 if the respondent lived in an urban area, and zero otherwise.

PRDUM = dummy variable taking a value of 1 if the respondent lived in the Punjab province, and zero otherwise.

IV. RESULTS OF ESTIMATION AND DISCUSSION

This section presents empirical results for the reduced form migration decision rule. As pointed out, the estimation is carried out by applying the maximum likelihood Probit technique. The results, in the following, are discussed in light of the hypotheses formulated in the previous section. However, to have a clear idea about the structure of the variables, mean and standard deviations of important variables are given in Table 1 and the correlation matrix of the determinants of migration is presented in Table 2.

Table 1 indicates that the average age of husband is around forty years, whereas the average age of wife is thirty-three years. While the average education of the male respondents is slightly over three years, the same figure for the female respondents reveals a dismal situation. The average female has only one year of schooling! In the migrants' sample, on the other hand, these figures improve slightly as the average education of both the sexes goes up by at least an additional year of schooling.

The correlation matrix in Table 2 describes the degree of association between pairs of variables. It is assumed that two variables will be strongly or highly correlated if the correlation coefficient (r) is greater than 0.5, or it lies between 0.3 and 0.49. Similarly, the term of moderate and weak correlation will be used if either $0.2 < r < 0.29$ or $0.1 < r < 0.19$, respectively. With this arbitrary choice, we observe a strong correlation between the educational achievements of wife and husband. Similarly, the possession of land is strongly correlated with husband belonging to the agricultural sector. The matrix reveals a high positive correlation between seven pairs of variables. Some of these include husband's and wife's education and their current monthly income, husband's education and the choice of profession, and husband being self-employed and belonging to the agricultural profession. A relatively moderate correlation can be noticed, among others, between husband's education and schooling of children and, similarly, between self-employment and

Table 1

Mean and Standard Deviations of Variables
Complete Sample and for Migrants Sample

Variables	Complete Sample		Migrants' Sample	
	Mean	SD	Mean	SD
Migration Status	0.09	0.29	–	–
Age (H)	40.50	9.54	39.41	9.28
Age (H) Squared	1730.50	793.14	1639.10	756.65
Age (W)	33.52	8.23	32.45	8.07
Education (H)	3.21	4.48	4.65	5.19
Primary (1–5)	0.13	0.34	0.14	0.35
Middle (6–8)	0.10	0.29	0.11	0.31
High (9–10)	0.10	0.30	0.14	0.35
College/University	0.07	0.25	0.13	0.34
Education (W)	0.90	2.65	1.38	3.27
Husband Self-Emp.	0.61	0.49	0.45	0.50
Occupation (H)				
Professional (OHP)	0.05	0.21	0.10	0.30
Clerical (OHC)	0.04	0.19	0.08	0.26
Sales (OHS)	0.14	0.35	0.11	0.31
Agriculture (OHAG)	0.38	0.49	0.28	0.45
Skilled (OHSK)	0.16	0.37	0.19	0.39
Other (OHO)	0.06	0.24	0.08	0.26
Wife's LFP	0.13	0.33	0.11	0.32
Ownership of				
(i) House	0.89	0.31	0.76	0.43
(ii) Land	0.31	0.46	0.21	0.41
Children in School	0.42	0.74	0.44	0.71
Family Type	0.68	0.47	0.71	0.46
Residence Dummy	0.41	0.49	0.48	0.50
Province Dummy	0.67	0.47	0.72	0.45

Source: PLM Survey data (1979-80).

Table 2

Correlation Matrix of Important Determinants of Internal Migration in Pakistan

	MGST	AMH	EDH	EDW	ESH	OHP	OHC	OHS	OHAG	OHSK	OHO	LFPw	HSTAT	LAND	CH5ST	FTYPE	log(Y)
MGST	1.00																
AMH	–0.04	1.00															
		1.00															
EDH	0.10	–0.09	1.00														
		–0.12	**1.00**														
EDW	0.05	–0.08	0.53	1.00													
		–0.15	**0.55**	**1.00**													
ESH	–0.11	0.07	–0.19	–0.14	1.00												
		0.14	**–0.23**	**–0.22**	**1.00**												
OHP	0.07	–0.001	0.36	0.23	–0.14	1.00											
		–0.05	**0.48**	**0.42**	**–0.18**	**1.00**											
OHC	0.06	–0.04	0.32	0.21	–0.26	–0.04	1.00										
		–0.09	**–0.29**	**0.15**	**–0.26**	**–0.09**	**1.00**										
OHS	–0.03	0.01	0.14	0.09	0.26	–0.09	–0.08	1.00									
		0.01	**0.05**	**–0.01**	**0.29**	**–0.12**	**–0.10**	**1.00**									
OHAG	–0.07	0.06	–0.32	–0.23	0.34	–0.18	–0.16	–0.31	1.00								
		0.14	**–0.37**	**–0.22**	**0.38**	**–0.20**	**–0.18**	**–0.22**	**1.00**								
OHSK	0.03	–0.05	–0.03	–0.01	–0.06	–0.10	–0.09	–0.18	–0.34	1.00							
		–0.13	**–0.07**	**–0.09**	**–0.01**	**–0.16**	**–0.14**	**–0.17**	**–0.30**	**1.00**							

Continued –

Table 2 – (*Continued*)

	MGST	AMH	EDH	EDW	ESH	OHP	OHC	OHS	OHAG	OHSK	OHO	LFPw	HSTAT	LAND	CH5ST	FTYPE	log(Y)
OHO	0.02	0.02	0.02	0.02	–0.16	–0.06	–0.05	–0.10	–0.20	–0.11	1.00						
		0.02	**–0.03**	**–0.07**	**–0.18**	**–0.09**	**–0.08**	**–0.10**	**–0.18**	**–0.14**	**1.00**						
LFPw	–0.01	0.01	–0.07	–0.04	–0.07	–0.03	–0.03	–0.05	–0.02	–0.01	–0.003	1.00					
		0.01	**–0.09**	**–0.06**	**0.06**	**–0.05**	**–0.04**	**–0.10**	**–0.01**	**–0.05**	**–0.03**	**1.00**					
HSTAT	–0.13	0.03	–0.19	–0.18	0.16	–0.09	–0.11	–0.04	0.20	–0.06	–0.07	–0.001	1.00				
		0.14	**–0.28**	**–0.20**	**0.19**	**–0.14**	**–0.11**	**0.01**	**0.31**	**–0.07**	**–0.09**	**0.02**	**1.00**				
LAND	–0.07	0.05	–0.26	–0.20	0.25	–0.12	–0.12	–0.22	0.69	–0.24	–0.15	–0.03	0.18	1.00			
		0.19	**–0.29**	**–0.20**	**0.23**	**–0.12**	**–0.13**	**–0.02**	**0.63**	**–0.19**	**–0.09**	**–0.06**	**0.28**	**1.00**			
CH5ST	0.01	0.05	0.27	0.19	–0.05	0.14	0.07	0.11	–0.19	0.03	0.04	–0.03	–0.10	–0.16	1.00		
		0.05	**0.33**	**0.17**	**–0.10**	**0.25**	**0.07**	**–0.05**	**–0.17**	**–0.001**	**0.05**	**–0.05**	**–0.06**	**–0.00**	**1.00**		
FTYPE	0.02	–0.04	–0.07	–0.03	–0.01	–0.05	–0.01	0.002	0.15	–0.01	–0.01	0.03	0.00	0.001	0.002	1.00	
		–0.03	**–0.01**	**–0.01**	**–0.07**	**–0.09**	**0.02**	**0.03**	**–0.04**	**–0.06**	**0.05**	**–0.02**	**–0.04**	**–0.02**	**–0.006**	**1.00**	
log(Y)	–0.01	0.11	0.33	0.25	0.02	0.15	0.05	0.12	–0.07	0.01	–0.01	–0.07	–0.07	0.002	0.23	–0.09	1.00
		0.12	**0.39**	**0.29**	**–0.12**	**0.33**	**–0.02**	**0.001**	**–0.10**	**–0.04**	**–0.08**	**–0.05**	**–0.07**	**–0.01**	**0.29**	**–0.07**	**1.00**

Note: (1) The bold figures are for the migrants' sample and the light figures are for the entire sample.
(2) These correlations are based on the PLM Survey data (1979-80).

the possession of land. Finally, Table 2 reports that at least for twenty-nine pairs of variables the correlation is weak. For the remaining cases the degree of association is low. A comparison of correlation coefficients of total versus migrants' sample shows that in the majority of the cases the magnitude of these coefficients for migrants is sizable (in absolute terms).

Table 3 presents the results of estimation of the reduced form migration decision rule. As indicated, the relationship between the age of migrant and the probability of migration can be seen at least in three perspectives. First, age can be considered as a "commitment to job" variable. In this case, the opportunity cost of migration rises for "committed" workers. Second, the results can be interpreted in terms of the "ability to adapt" argument that predicts an adverse relationship between these two variables, since the older the age, the more hesitant these individuals will be to accept the norms of a new place. Finally, due to a longer expected span of working life, the incentive to migrate is higher for younger people.[16] Given these arguments, we observed a negative relationship between age and migration, which very weakly indicates that the more experienced a worker is, the lower is the probability of migration. In an alternative specification, where square of age was included in the model specification, the results did not improve statistically, even though the coefficients were in the right direction.[17] Similarly, wife's age did not play any significant role in the family's decision to migrate.

In the present model, the level of education possessed by an individual is seen in the context of human capital. A number of studies such as Oberai and Singh (1983); Lee (1985); Robinson and Tomes (1982) and Krieg (1990) have found that the migration decision is strongly influenced by educational achievements. Considering its significance, this variable is disaggregated into four categories.[18] The results presented in Table 3 indicate that migrants are highly selective with respect to education. Not only the size of the coefficient, but its level of significance also improves with additional years of schooling. Contrary to this, wife's education or literacy does not appear to be an important determinant of the migration decision in Pakistan. In a male-dominated society, such a result is not surprising.

Since both the labour demand and supply as well as the level of earnings vary, to a great extent, with occupation, this variable occupies an important place in studies on migration. In the present model, occupation of husband is disaggregated

[16]There are a number of studies which have used these arguments to support estimation results. See for example, Caldwell (1968); Long (1973); Lee (1985); Gallaway (1969) and Hamdani (1977).

[17]To save space, the results of alternative specification are not reported in the paper. Interested readers can have these results from the authors.

[18]These categories are: one to five years of education is referred to as primary school education, 6 to 8 years imply middle school, 9 to 10 is high school and, finally, more than ten years of schooling is referred to as college/university education. As the percentage of college and university graduates in the sample is low, these two groups are merged together.

Table 3

Maximum Likelihood Probit Estimates of the Reduced Form Migration Decision Rule

Variables	Estimated Coefficients	*t*-statistics
Constant	–0.864	–5.49*
AGE (H)	–0.003	–1.22
EDUCATION[a] (H)		
Primary (1–5)	0.141	1.84***
Middle (6–8)	0.174	1.97**
High (9-10)	0.241	2.56**
College/University	0.403	3.28*
Education[b] (W)	–0.095	–1.08
Husband Self-employed	–0.336	–5.31*
Occupation[c] (H)		
Professional	0.300	2.40**
Clerical	0.176	1.32
Sales	0.086	0.82
Agriculture	0.124	1.32
Skilled	0.192	2.22**
Other	0.126	1.10
LF Participation (W)	–0.002	–0.78
Ownership of		
House	–0.505	–6.93*
Land	–0.146	–1.83***
Children in School	–0.060	–1.62
Family Type[d]	0.072	1.32
Residence Dummy[e]	–0.160	–2.25**
Province Dummy[f]	0.254	4.29*

[a]Reference Group = Husband possesses no education.
[b]Reference Group = Wife possesses no education.
[c]Reference Group = Husband engaged in HH work, or his occupation is unspecified.
[d]Reference Group = Respondent belongs to extended family.
[e]Reference Group = Respondent belongs to rural area.
[f]Reference Group = Respondent belongs to provinces other than Punjab.
* Significant at $\alpha < 0.01$.
** Significant at $\alpha < 0.05$.
*** Significant at $\alpha < 0.1$.

Summary Statistics

Log Likelihood Ratio	–1527.1
Restricted Log-L	–1617.6
Chi-Squared (20)	181.0
Sample Size	5186.

into six categories, which are: professional, clerical, sales, skilled, agriculture, and other (unskilled and military service, etc.). The omitted category is "husband engaged in household work or his occupation is unspecified". The results reveal that professional and skilled workers are relatively more inclined towards migration as compared to those belonging to clerical and sales categories.

So far as the role of assets in the migration decision is concerned, the available literature provides conflicting evidence. On the one hand, Bilsborrow (1981) thinks that those who own large tracts of land are relatively high-income earners who can afford the migration cost and thus have a greater incentive to migrate, Da Vanzo (1981) considers land a location-specific asset that deters individuals from moving due to raised costs of migration. The results of the present analysis support Da Vanzo's claim in that a negative and significant relationship is observed between the migration decision and the ownership of land. Since the ownership of a house is also a location-specific capital, a negative and significant coefficient accords with our *a priori* expectations. This result is supported by earlier studies of Sirageldin *et al.* (1984) for Saudi Arabia and Lee (1989) for Malaysia. In both these studies, a strong negative relationship between the ownership of a house and the migration decision was observed.

The results also confirm that the higher the number of school-going children in a family, the higher is the cost of migration due to relocation. Similarly, wife's labour force participation in the area of origin appears to restrict mobility. Although an expected adverse effect is observed, nevertheless these variables are not statistically significant.

Finally, residential dummy variable is used to measure the level of accessibility to various modern amenities generally available in the urban areas. The negative coefficient of this variable in Table 3 supports the contention that urban dwellers have less desire to migrate as opposed to the residents of the rural areas. Similarly, the incidence of migration is higher among those living in Punjab as compared to those living in the NWFP or Sindh provinces.

V. SUMMARY AND CONCLUSIONS

This paper developed a model of internal migration in Pakistan in light of the theory of migration which considers migration as an investment in human capital. Using the PLM (1979-80) data, the estimation of the migration decision rule was carried out by applying the maximum likelihood probit estimation technique. Keeping in line with the literature from other developing countries, three types of variables, namely, the possession of human capital, commitment to job and place of residence, and proxies for the cost of migration, were identified as the possible determinants of migration. The important conclusions of this study are as follows:

1. Since one of the crucial factors in mobility is the possibility of getting a better-paying job at the place of destination, greater emphasis was placed on human capital variables. As pointed out, education not only reduces the length of unemployment, it also lessens the cost of retrieving information about the labour market. For this purpose, education of husband was disaggregated into four categories. The results indicated that additional years of schooling increased the probability of migration. The incidence of migration was the highest amongst those who possessed college or university degrees.
2. Education of wife, on the other hand, did not significantly influence migration decision, and the same was true for wife's participation in the labour market.
3. Respondent's age was considered as one of the crucial factors in the migration model. Although this variable appeared with the correct sign, the results did not support the hypothesis that older and experienced workers have a weaker tendency to migrate than do their younger colleagues.
4. The ownership of land and house were used as "commitment" variables. After controlling for other factors, these variables restricted mobility due to higher costs of relocation in a new place.
5. Based on a similar argument, the presence of school-going children in a family reduced the probability of migration.
6. It was also observed that the incentive to migrate was relatively lower among urban area residents and, similarly, among the residents of Sindh and the NWFP provinces.

In summary, the results of the present study indicate that, in general, migrants in Pakistan are selective especially in terms of age, education, and choice of occupation. Those who migrate are relatively more educated and belong to better-paying professions. These findings are consistent with the existing evidence from other developing countries.

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