

IMPACTS OF SOCIO-DEMOGRAPHIC CHARACTERISTICS ON MALE MIGRANTS: LOGISTIC REGRESSION APPROACH

MD. RAFIQUUL ISLAM
University of Rajshahi
rafique_pops@yahoo.com

MD. ABDUR ROKIB
University of Rajshahi
rokibpops@gmail.com

ABSTRACT

The study of migration is the key importance not only in Demography but also in Population Studies. Migration is the primary stage of development. Migration is related to development, urbanization, industrialization as well as technological advancement. The aim of this study is to observe the effects of socio-economic and demographic factors on male migrants. The sample data of 700 respondents was collected by multi-stage sampling technique at Meherpur Sadar thana at Meherpur district, Bangladesh. In this paper, logit regression model has been used to determine the influential factors of migration. The study shows that the most of the male migrants are migrated due to services. The analysis indicated that age, place of birth, occupation, monthly income and land property have significant effects on causes of migration among the selected variables in the case of considering dependent variable as causes of migration. Whereas on the other hand, place of birth, monthly income, type of family and land property have significant effects on the type of migration. Moreover, using the cross validation predictive power (CVPP) criterion and R^2 , the shrinkage coefficient (λ) is constructed. The shrinkage coefficient determines the adequacy of the model.

Keywords: Male migrants, Socio-economic factors, Demographic factors, Logistic regression model, Cross validity prediction power (cvpp), Shrinkage coefficient.

I. INTRODUCTION

Bangladesh is one of the most heavily inhabited countries of the world. The population of Bangladesh is mostly poor and maximum of them lives in the agrarian based rural areas. Migration studies in

different region in developing countries have generally dealt with the economic aspects of migration. However, majority of these studies have dealt with the differentials and determinants of migration focusing mainly on causes and consequences of migration (Afsar, 1995; Selvaraj and Rao, 1993;

Yadava, 1988). The physical disconnection between husband and wife, as a result, migration gives the female partner less scope for conception that outcome in low fertility of the migrant households (Sharma, 1992).

Migration is a process that occurs between two places of people with many objectives. Many researchers are tried to establish some uniformly applicable migration patterns for all countries at all times. Nevertheless, both these categories are preponderantly driven by economic reasons. Information and communication also influence the decision of migration (CUS, 1990). Numerous studies reported that determinants of migration vary from country to country and even within a country, it varies depending on the socio-economic, demographic, and cultural factors. High unemployment rate, low income, high population growth, uneven distribution of land, demand for higher schooling, prior migration patterns, and dissatisfaction with housing have been identified as some of the most important determinants of rural out migration (Bilsborrow et al., 1987; Kadioglu, 1994; Nabi, 1992, Sekhar, 1993 and Yadava, 1988) finds that out migration of young male leads to decline in fertility at the place of origin.

It is a fact that migration can reduce poverty and stimulate economic growth. While the evidence is most clear in situations where economies are growing rapidly as in Asia, other contexts present a more mixed picture with both push and pull factors operating, creating less accumulative types of migration as seen in African countries with stagnant economies. Afsar (2003) argues that migration has reduced poverty directly and indirectly in Bangladesh as remittances

have expanded the area under cultivation and rural labor markets by making land available for tenancy. Therefore, the development of infrastructure raised the productivity of agriculture which created a demand for migrant labor and the remittances sent by them helped people staying behind. Anh (2003) identifies migration is a driver of growth and an important route out of poverty with significant positive impacts on peoples livelihoods and welfare and concludes that attempts to control mobility will be counterproductive. The accelerating rate of rural-urban migration (urbanization) is high among the least developed countries in Asia. Hugo (1981) estimated the loss of young adults through migration from village leads to undermining of agricultural production by way of agricultural laborer. People migrated to cities and towns because they are attracted by livelihood opportunities. Studies on migration have been established with positive association between levels of infrastructural development of a region and the magnitude of out-migration (CUS, 1990).

Urbanization has been one of the dramatic international societal transformations of the 20th century. The propensity of migration is habitually influenced by a combination of push-pull factors. In Bangladesh, adequate attention to migration aspects has not given which may be due to lack of national level information. The existing micro-level studies mostly investigate the characteristics of migrants at destination places mainly Dhaka city (CUS, 1990 and 1996), giving a little attention to the causes of out- migration from villages (Afsar, 1995). Majumder et al. (1989) and Amin (1986) studied the economic consequences of migration based on sample surveys conducted in Dhaka city.

Chowdhury (1980) found that out-migration is generally higher from the villages characterized by land scarcity, unequal distribution of land, and high proportion of agricultural laborer. Afsar (1995) argued that migrants often benefited more than non-migrants because of their innovative, risk taking and desperate nature. The benefits included higher or regular income, gain in wealth, greater access to public services and education. Rahman et al. (2007) identified that education, monthly income, type of family and land property had significant effect on causes of migration. Islam and Siddiqi (2010) showed that age at marriage, occupation, religion, marital status, type of family, type of migration had significant effect on causes of migration for female migrants.

Therefore, the main objective of this paper is to identify the determinants of migration and hence also to identify the factors affecting on causes of migration and type of migration.

II. SOURCES OF DATA OF THIS STUDY

This research has been basically performed using primary data. The data was collected during 5th to 27th January in 2008 from Meherpur district under seven wards at Meherpur Sadar thana by multistage (i. e., three stage) sampling technique (Islam, 2005). In this study, three-stage sampling technique was adopted, that is, Meherpur district was chosen as 1st stage and then, Meherpur Sadar thana out of three thana of Meherpur district was taken as second stage. Thereafter, seven wards out of nine wards of Meherpur Sadar thana was considered as third stage. Sample sizes of 700 respondents

are interviewed in this study. At the time of data collection some socio-economic and demographic variables of the migrants are considered.

III. METHODOLOGY

The following methods are applied in this manuscript:

3.1 Logistic regression model

The logistic regression model can be used not only to identify risk factors but also to predict the probability of success. This regression is useful when the dependent variable is dichotomous. In this model, the dependent variable Y is dichotomous and independent variables (X_j) are categorical. The logistic regression model is addressed by the following:

$$Y = \frac{e^{\beta_0 + \beta_1 X_1 + \dots + \beta_k X_k}}{1 + e^{\beta_0 + \beta_1 X_1 + \dots + \beta_k X_k}}$$

where $\beta_0, \beta_1, \dots, \beta_k$ are parameters and X_1, X_2, \dots, X_k are the explanatory variables that are presented in the respective tables.

The two dependent variables for two models considered in this study are as follows:

For model 1:

$$Y = \begin{cases} 1, & \text{if migration is occurred due to economical causes} \\ 0, & \text{otherwise} \end{cases}$$

For model 2:

$$Y = \begin{cases} 1, & \text{if rural to urban migration} \\ 0, & \text{otherwise} \end{cases}$$

The independent variables used in these models are presented in the individual tables.

3.2. Model accuracy test

In this paper, to assess the accuracy and reliability of these models, the cross- validity

prediction power (CVPP), ρ_{cv}^2 , is applied. The mathematical formula for CVPP is specified by

$$\rho_{cv}^2 = 1 - \frac{(n-1)(n-2)(n+1)}{n(n-k-1)(n-k-2)}(1-R^2).$$

In which, n is the number of classes, k is the number of regressors in the fitted model and the cross-validated R is the correlation between observed and predicted values of the predictand variable (Stevens, 1996). The shrinkage coefficient of the model is the positive value of $(\rho_{cv}^2 - R^2)$; where ρ_{cv}^2 is CVPP and R^2 is the coefficient of determination of the model. 1-shrinkage is

the stability of R^2 of the model. The estimated CVPP related to their R^2 and information on model fittings are presented in Table 4.

IV. RESULTS AND DISCUSSION OF RESULTS

The background characteristics of the migrants are presented in Table 1. Maximum number of migrants 23% are belongs to age group 40-44 years. From the same table, it is observed that maximum number of migrants (37.1%) is migrated due to job. Most of them (35.9%) are graduation and above level educated. It is also observed that maximum number of migrants (37.31%) earn more

Table 1
Percentage distribution of the background characteristics of male migrants

Background characteristics	Number of migrants	Percentage	Background characteristics	Number of migrants	Percentage
Age group:			Occupational status:		
15-19	2	0.3	Farmer	71	10.1
20-24	8	1.1	Job	290	41.4
25-29	40	5.7	Business	205	29.3
30-34	85	12.1	Labor	100	14.3
35-39	154	22.0	Others	34	4.9
40-44	161	23.0			
45-49	123	17.6	Per-Monthly income (Tk):		
50-54	86	12.3	<1000	12	1.7
55+	41	5.9	1000-2000	36	5.1
Causes of migration:			2001-3000	81	11.6
Political	50	7.1	3001-4000	34	4.9
Economical	108	15.4	4001-5000	41	5.9
Education	6	0.9	5001-6000	80	11.4
Marriage	-	-	6001-7000	53	7.6
Environment	59	8.4	7001-8000	102	14.6
Job	260	37.1	8000+	261	37.31
Business	130	18.6			
Others	87	12.43	Type of family:		
Educational level:			Single	554	79.1
Illiterate	81	11.6	Joint	146	20.9
Signatory	44	6.3	Religion:		
Primary	152	21.7	Muslim	664	94.86
Secondary	133	19.0	Non-Muslim	36	5.14
Higher secondary	39	5.6	Land property:		
Graduation and above	251	35.9	<25	296	42.3
			25-50	76	10.9
			51-75	96	13.7
			76-100	43	6.1
			100+	189	27.0

than 8000 TK and most of the migrated family (79.1%) are single family. It is also seen that most of the migrants (27%) have more than 100 decimal land properties.

an important role on causes of migration. The estimated regression co-efficient of occupation of migrant's are -0.682 and -1.414 which means it has negative effects

The results of logistic regression model are presented in Table 2 and Table 3 for causes of migration and type of migration respectively. Table 2 shows that five variables are statistically significant at 10% level among the selected variables. The estimated regression co-efficient of migrant's age belongs to the range (20-25) years are -6.741 which has negative effects on migration and age over 25 years are 1.498 which means it has positive effects on migration. From the above table it is observed that the risks of migration that are belonging to the age 20-25 years are 0.001 times lower and belonging to the age 25+ years are 4.473 times higher than that of age under 20 years.

Logistic regression procedure indicates that place of birth is an important factor for causes of migration. The estimated regression co-efficient of urban area is 0.979 that means positive effects on migration. The odds ratio of urban area is 2.662. It is indicated that the risks of migration is 2.662 times higher than that of rural areas. Occupation plays

Table 2
Logistic regression estimates for the effects on causes of migration with demographic and socio-economic variables

Characteristics	Coefficient (β)	Odds ratio
Respondent's age:		
<20 (R)	-	1.00
20-25	-6.741	0.001
25+	1.498*	4.473
Place of birth:		
Rural (R)	-	1.00
Urban	0.979*	2.662
Religion:		
Muslim (R)	-	1.00
Non-Muslim	-0.093	0.911
Educational qualification:		
Illiterate (R)	-	1.00
Primary	-0.477	0.612
Secondary and above	0.455	1.576
Occupation:		
Farmer (R)	-	1.00
Service	-0.682	0.506
Other's	-1.414*	0.243
Monthly income:		
<1000 (R)	-	1.00
1000-3000	-4.656	0.010
3001-5000	0.745*	2.105
5000+	1.244*	3.468
Type of family:		
Single family (R)	-	1.00
Joint family	0.488	1.628
Land property:		
<25 (R)	-	1.00
25-100	2.818*	16.749
100+	1.451*	4.266
Constant	-4.920	0.007

*Significant at $\rho < 0.10$ and R means reference category

on migration. The odds ratio of service and others occupation are 0.506 and 0.243 times lower risks of migration than that of farmers. The estimated regression co-efficient of income of migrant's belongs to the range TK (1000-3000) are -4.655 which means it has negative effects on migration and belongs to the range TK (3001-5000) and TK 5000+ are 0.745 and 1.244 which means it has positive effects on migration. The odds ratio belongs to the range TK (1000-3000), TK (3001-5000) and TK 5000+ are 0.010 times lower risks and 2.105 and 3.468 times higher risks of migration than that of under TK 1000. The estimated regression co-efficient of land property of migrant's belongs to the range 25-100 decimal and 100+ decimal are 2.818 and 1.451 which means that it has positive effects on migration. The odds ratio of land property of 25-100 decimal and 100+ decimal is 16.749 and 4.266. It is indicated that 16.749 and 4.266 times higher risks of migration than that of under 25 decimal.

Table 3 shows that place of birth, monthly income, type of family and land property are statistically significant at 10% level. The estimated regression coefficient of urban area is -3.675 which means it has negative effects on migration. The odds ratio

of urban area is 0.025 which is indicated that 0.025 times lower risks of migration than that of rural area. The estimated regression co-efficients of income are -2.437 and -1.509 which means that it has negative effects on migration and 0.337 which means

Table 3
Logistic regression estimates for the effects on type of migration with demographic and socio-economic variables.

Characteristics	Coefficient (β)	Odds ratio
Respondent's age:		
<20 (R)	-	1.00
20-25	-7.975	0.000
25+	-6.348	0.002
Place of birth:		
Rural (R)	-	1.00
Urban	-3.675*	0.025
Religion:		
Muslim (R)	-	1.00
Non-Muslim	-0.716	0.489
Educational qualification:		
Illiterate (R)	-	1.00
Primary	0.546	1.726
Secondary and above	-0.265	0.767
Occupation:		
Farmer (R)	-	1.00
Service	-0.737	0.479
Other's	-0.094	0.911
Monthly income:		
<1000 (R)	-	1.00
1000-3000	-2.437*	0.087
3001-5000	-1.509*	0.221
5000+	0.337	1.401
Type of family:		
Single family (R)	-	1.00
Joint family	-1.066*	0.344
Land property:		
<25 (R)	-	1.00
25-100	0.469*	1.598
100+	0.874*	2.396
Constant	8.730	6185.228

*Significant at $\rho < 0.10$ and R means reference category

that it has positive effects on migration. The odds ratio belongs to the range Tk (1000-3000) and TK (3001-5000) are 0.087 and 0.221 which is indicated that 0.087 (8.7%) and 0.221 (22.1%) times lower and belongs to the range TK 5000+ are 1.401 which means 1.401 times higher risks of migration than that of under TK 1000. The regression coefficients of type of family are -1.066 that means it has negative effects on migration. The odds ratio of joint family are 0.344 which is indicated that 0.344 (34.4) times lower risks of migration than that of single family. The regression co-efficient of land property (25-100) decimal are 0.469 and 100+ decimal are 0.874 which means that it has positive effects on migration. The odds ratio for land property (25-100) and 100+ decimal have 1.598 and 2.396 times higher risks of migration than that of under 25 decimal.

The information on model fittings for two models are presented in Table 4 in which it is found that CVPP for two models are more than 37% and 42% respectively and their corresponding shrinkage coefficients are only 0.015062 and 0.0139378. Moreover, the stability of R² of these two models are more than 98.4% and 98.6% respectively. Hence the fit of these models are well.

group 40-44 years and 37.1% migrants is migrated due to job. 35.9% are graduation and above level educated. It is also observed 37.31% earn more than 8000 TK and most of the migrated family (79.1%) is single family. It is also seen that 27% have more than 100 decimal land properties. The logistic regression analysis suggested that age, place of birth, occupation, monthly income and land property have significant effects on causes of migration among the selected variables in the case of considering dependent variable as causes of migration. But, on the other hand, place of birth, monthly income, type of family and land property has significant effects on type of migration.

Government and Non-Government organizations (NGOs) should take proper steps to boost infrastructure, job opportunity, and educational facility in the rural area for reducing rural to urban migration. As a consequence, pressure of urbanization would be abated dramatically.

The limitation of this study is to time constraint because this research is a part of M. Sc thesis. For that reason, it would not be possible to increase sample size of this research.

Table 4
Information on modeling fittings

Models	n	K	R²	ρ_{cv}^2	Shrinkage Coefficient (λ)	Stability of R² of the model
1	700	8	0.39187	0.37680	0.015062	0.984938
2	700	8	0.43726	0.42332	0.0139378	0.9860622

V. CONCLUSION AND RECOMMENDATION

In this study, it is found that maximum number of migrants (23%) belongs to age

Further study can also be done for determining socio-demographic characteristics on male migrants using path model analysis, factor analysis as well as component analysis.

REFERENCES

- Afsar R. (2003). Dynamics of Poverty, Development and Population Mobility: The Bangladesh Case', Ad Hoc Expert Group Meeting on Migration and Development, Organized by the Economic and Social Commission For Asia AndThe Pacific, Bangkok, 27-29 August.
- Afsar, R. (1995). Causes, Consequences and Challenges of Rural-Urban Migration in Bangladesh, Doctoral Dissertation, University of Adelaide, Australia.
- Amin, A. T. M. N. (1986). Urban Informal Sector: Employment Potentials and Problems in Bangladesh, In: Selected issues in Employment and Development, edited by R. Islam and M. Mugtada, New Delhi: ILO, ARTEP.
- Anh, D. N. (2003). Migration and Poverty in Asia: with reference to Bangladesh, China, the Philippines and Viet Nam, Ad Hoc Expert Group Meeting on Migration and Development, Organized by the Economic and Social Commission For Asia and The Pacific, Bangkok 27-29 August.
- Bilsborow, R.E., T.M McDevitt, S. Kossoudji and R. Fullers (1987). The Impact of Origin Community Characteristics on Rural-Urban Out-Migration in a Developing County, *Demography*, 24:191-210.
- Chowdhury, R.H. (1980). Urbanization in Bangladesh, Center for Urban Studies, University of Dhaka.
- CUS (1990). Slums and Squatters in Dhaka City, Center for Urban Studies, (Edited by Nazrul Islam et al.), Dhaka, Bangladesh.
- CUS (1996). The Urban Poor in Bangladesh, (Edited by Nuzrul Islam), Centre for Urban Studies, Dhaka, Bangladesh.
- Hugo, G. J. (1981). Population Movement in Indonesia During the Colonial Period, The Australian University Press, Canberra, 95-136.
- Islam, M. Nurul (2005). An Introduction to Sampling Methods, Book World, Dhaka, Bangladesh.
- Islam, M. R. and M. N. A. Siddiqi. Socio-demographic Characteristics of Female Migrants and Determinants of Female Migration, *Afro Asian J. of Anthropology and Social Policy*, Vol. 1, No. 1, January-June, 2010:71-80.

- Kadioglu, A. (1994). The Impact of Migration on Gender Roles: Findings from Field Research in Turkey, *International Migration*, Vol. 32(4): 533-561.
- Majumder, P. S. Mahmud and R. Afsar (1989). Squatter Life in the Agargaon Area, Dhaka Bangladesh: BIDS, Mimeco.
- Nabi, A. K. M. Nurun (1992). Dynamics of Internal Migration in Bangladesh, *Canadian Studies in Population* 19(1); 81-98.
- Rahman, M., M.R. Islam and M. Rahman (2007). Causes and Consequences of In-Migration at Rajshahi City Corporation, Bangladesh, *Journal of Engineering and Applied Sciences*. Vol 2(2):305-308.
- Selvaraj, K. G. and P. S. S. Rao (1993). Household Migration-Urbanization and Consequences, *Demography India*, Vol. 22, 203-210.
- Sharma, H. L. (1992). A Study of Relationship between Migration and Fertility, *Demography India*, Vol. 21(1), 51-57.
- Sekhar, T. V. (1993). Migration Selectivity from Rural Areas: Evidence from Kerala, *Demography India*, Vol. 22(2), 191-202.
- Stevens, J. (1996). *Applied Multivariate Statistics for the Social Sciences*, Third Edition, Lawrence Erlbaum Associates, Inc., Publishers, New Jersey.
- Yadava, K. N. S. (1988). *Determinants, Pattern and Consequences of Rural-Urban Migration in India*, Independent Publishing Company, Delhi, India.

Short Bio of Md. Rafiqul Islam

Md. Rafiqul Islam. He obtained B. Sc. honours in mathematics securing 1st class 1st position and M. Sc. in Pure Mathematics securing 1st class 2nd position. Moreover, he received Rajshahi University award and Gold Medal for outstanding results in B. Sc. honours. He also studied Statistics and Economics as related subjects in honours level. He was awarded Ph. D. degree of entitled “Modeling of Demographic Parameters of Bangladesh An Empirical Forecasting”. Now, he Professor in the Department of Population Science and Human Resource Development, Faculty of Science, Rajshahi University, Bangladesh. He has 13 years teaching experience in this department. He has published a large number of research articles as author and co-author in national and international journals. He produce a good number of M. Sc, M. Phil and Ph. D thesis. In addition to, his name is included in many international journals as a member of editorial board and reviewer.

Short Bio of Md. Abdur Rokib

Md. Abdur Rokib. He obtained B.Sc. honours in Population Science and Human Resource Development scuring 1st calss 4th postion and M.Sc. in the same department securing 1st calss 3rd position. He is now research fellow in this department.