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Influence of Poverty on Internal Household Mobility Pattern of a City: A Case Study of Khulna City

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Abstract

Because of severe incidence of poverty, unemployment, housing shortage and rapid growth of urban population; the slum and squatters (pocket poverty zone) are quite common in Bangladesh. Through increasing the inequality, crime rate, socio-political tension; the pocket poverty zones (PPZs) can create significant impacts on the mobility pattern of the urban dwellers, which is a well-pronounced phenomenon in scholarly literature. To analyze the effect of PPZs on the mobility pattern of the households, a two-step model is proposed where the mobility is defined as a function of the household's ability to move out and tension level. Additionally, magnetic effect that forces them to stay at the current location even though the tension and ability to move out is very high is also introduced in the model. The socio-political reasons are the most prominent factors influencing the mobility pattern of the slum and non-slum dwellers. Some other factors like; house rent, educational status etc. also seem quite influential decision-making factors. This paper adds further insight into the existing literature explaining the poverty induced household mobility pattern.

Introduction

An imbalance between rapid urban population growth coupled with poverty, insufficient employment opportunities and housing supply are responsible for the mushrooming of slum and squatter settlements. "Slum" is used for the legal settlements of the low-income group. On the contrary, "Squatter" is used for the illegal settlements. Throughout this paper, the slums and squatters are called Pocket Poverty Zone (PPZ).

The negative impacts of these settlements on the surrounding neighborhoods are also obvious and there is no disagreement about this in the scholarly literatures. Some of the well-recognized impacts of the PPZs are crime, environmental pollution, and creation of psychological tension, social inequality, political divergence and so on. Freeman (2003) while describing the impact of the concentrated poverty on the neighborhood stated, "AHDs (Assisted Housing Development) stigmatize surrounding neighborhood and alter the migration pattern of the middle-class households, causing them to flee and avoid these neighborhoods". Some of the research works have shown the impacts of the AHDs on the social condition of an area (Popkin et al. 2000; Venkadesh 2000). The detrimental impacts on surroundings are declining property values, increased crime, white flight, and concentration of poverty (Freeman and Botein 2002). Mugisha *et al.* (2003) have stated that drug addiction and crime rate is relatively higher in the PPZs. As people think of the poor responsible for this increased crime and social disorder, they use to avoid these poor communities. Racial prejudice as a product of poverty is also responsible for the mobility pattern of the people living close to PPZs (Schuman, Steeh, and Bobo 1985). Moreover, socio-economic characteristics are one of the major determinants of choosing a place to live. So whenever concentrated poverty evolves in some areas, the people living close to these communities use to leave this area for greater socio-economic homogeneity.

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In search for better and suitable living environment, people use to go from one place to another. The disequilibrium model of residential mobility (Onaka, 1983; Hanushek and Quigley,1978; and Barro, 1971) places local moves in the context of a household's continuing concern to bring their housing demands into adjustment with the housing units available to them (Clark and Ledwith, 2005). The mobility process in local housing markets is about adjusting households to space and is thus about housing consumption (Clark and Dieleman, 1996; Dynarski, 1985; Henderson and Ioannides, 1989). It is also about the sorting mechanisms whereby households distribute themselves across neighborhoods and communities in cities. At an aggregate level, it offers insights into the role that residential mobility plays in concentrating or dispersing neighborhood poverty and compounding household-level disadvantage (Quillan, 1999; Clark and Ledwith, 2005). The characteristics of the houses including its socio-political surroundings are the main determinants influencing the decision whether a family moves or stays. In other words, people's satisfaction level about the house is the main influencing factor in the mobility related decision (Speare, 1984). Several literatures have dealt with the neighborhood variables influencing people's mobility related decision (Kearns and Parkinson, 2001; Butler and Robson, 2001; Forrest and Kearns, 2001).

The harmonious co-existences of the land uses largely depend upon the external economy of the land uses. The presence of the urban poor may create external diseconomy among the land uses. The main functions of the urban planners are to guide and control the city, its environments and to achieve sound and sustainable living environment for the citizens. Nevertheless, as the location of the urban poor and its interaction with the surrounding neighborhoods is still a mystery for the urban planners, researches on this field is urgently needed.

PPZs are often viewed as responsible for concentrating poverty in the neighborhood (Davis, 2004; Kraus, 2004). Lance Freeman (2003) stated these concentrated poverty zones (CPZs) as the locally unwanted land use (LULU). He also stated NIMBYism ("Not in my back yard" reaction) as the people's views about the same. Several literatures have dealt with the cause of the concentrated poverty (Wilson 1987; Massey and Denton, 1993). Elite theory (Hunter, 1953); Pluralist thought (Banfield, 1961; Dahl, 1961) and regime theory (Stone, 1989) are already developed to explain the process of the concentration of the urban poverty. All these theories and thoughts have somehow dealt with the development policies, housing discrimination, education, public housing, urban renewal projects (Greer, 1965; Jacobs, 1961; Kaplan, 1963) etc. as the causes of the concentrated poverty (Henig et al., 1999). All these papers dealt with the developed world's scenario. However, this paper deals with the impacts of these poverty concentrations on the neighborhood with special focus on the household mobility pattern. We explored the impact of PPZs on the household mobility pattern of Bangladesh where mobility is defined as a function of ability to move out, tension created by different internal and external factors and the magnetic effect that minimizes the effect of ability and tension.

Study Area

Khulna City is the prime urban center of the southwestern region of the Bangladesh near the Sundarbans, the largest tract of mangrove forest of the world. It is situated below the tropic of cancer, around intersection of latitude 22.49º north and longitude 89.34º east. During the 1960s, due to the availability of cheap communication and establishment of the Mongla seaport; industrialization started. Until then the economy of Khulna was dependent on the export oriented industrial goods. Nevertheless, after 1980s, industrial products of Bangladesh failed to compete in the global market and deindustrialization started. A total shift of economy was observed at that time. Shrimp farming and shrimp processing industries flourished in and around Khulna. Service sector also started flourishing at that time.

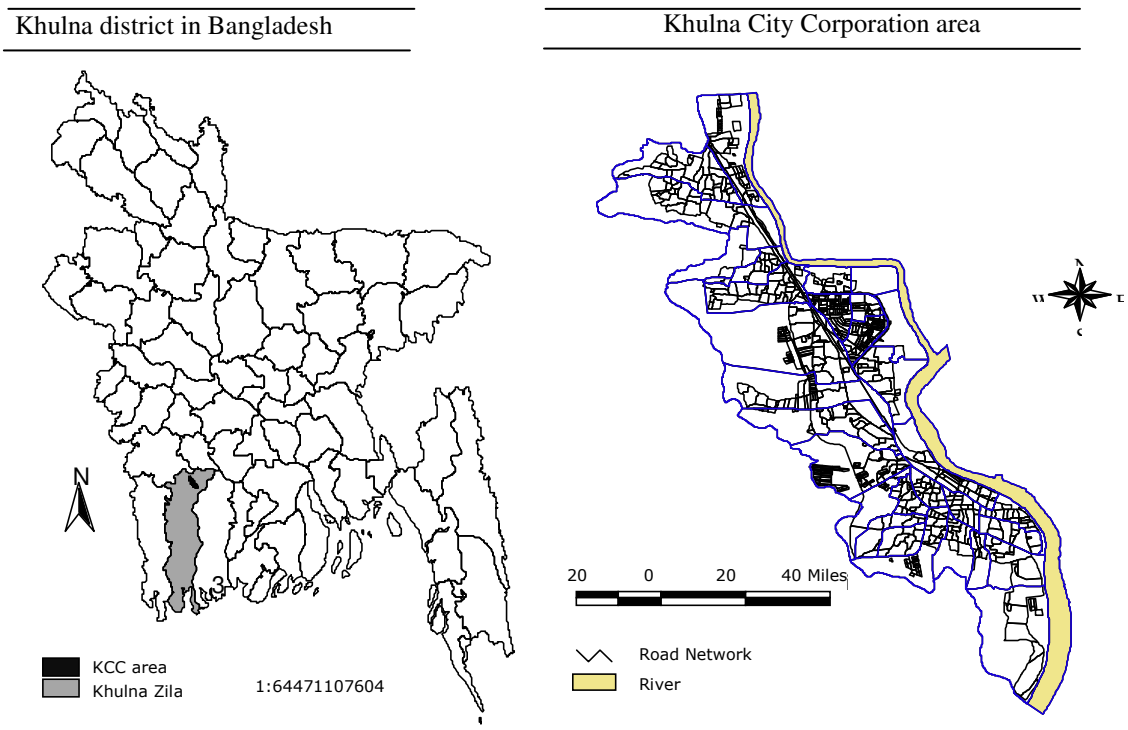

Fig. 1: Khulna City Corporation Area and its location of Khulna city in context of Bangladesh

According to Khulna Master Plan, 28 per cent of the households live below poverty line with an average income of less than US$ 52 (1 US$ = BDT* 68 as on March 27, 2006). US$ 52 (BDT 3,500) was set as the poverty line by the Khulna Master Plan. The poverty line for the hardcore poor was set at US$ 36 (Taka 2,500). Again 14 per cent of the household in Khulna city are under hardcore poverty line. Sixty seven per cent of the households spent less than US$ 81 (BDT 5,500) per month or less than US$ 15 (BDT 1,000) per month per person. Here, more than two-thirds of the people spend less than a dollar per day. In the last ten years, more than 30% of the industrial workers have lost their job due to the current trend of deindustrialization. The service sector has failed to provide sufficient number of jobs (KDA, 2000). This presents the severity of the poverty in Khulna city.

The Two-Step Model

A family (q) prefers a house to live based upon their individual location choice criteria (C_q) at a specific time. The probability of moving out of the current location (Pr_q) right after the initial settlement will be close to zero. After a certain duration, the family (q) will explore both positive and negative aspects of the location and generally the tension level (Tn_q) will continue increasing. Sometimes some magnetic forces (Mg_q) may force the family to stay at the current

* Bangladeshi Taka (the currency of Bangladesh)

location (Landale and Guest, 1985; Moore, 1986). For instance, one or more family members may be sick and they may not have any other places to go. Again, family may not have the ability (Ab_q) to move to another place (Rosenbaum, 2001). Time is also a very important criterion for increasing the dissatisfaction level or the people's intension to move out of current location (McHugh, Gober and Reid, 1990). Hence, when C_q is constant, the probability to move out of current location is a function of Tn_q, Mg_q and Ab_q. To identify Tn_q, Mg_q and Ab_q, the independent variables were divided into three representing tension, magnetic force and ability (please see Table 02). Additionally, the total sample was divided into three income groups namely; higher, middle and lower income group. The proposed two-step model is applied for each of the income group separately.

Hypothetically, Tn_q and Ab_q have positive effects on P_q. On the contrary, Mg_q has negative effect. To identify the probability of Mg_q and Ab_q, dichotomous variables like "Presence of any magnetic force" and "ability to move out of current location" were used as the dependent variable for the binary logistic regression. The probability of the ability of the q^{th} household, $Pr(Ab_q)$ was calculated by using the following equation (1).

$$Pr\left(Ab_q\right) = 1/\left[1 + exp\left\{-\left(\sum_{k=1}^{n} \beta_k x_{ik} + \varepsilon_i\right)\right\}\right] \quad (1)$$

Where, ε_i = error term

x_{ik} = values of predictors of ability for i^{th} case and k^{th} variable

β_k = Regression coefficient; $1 \le k \le n$

Similarly, by using the following equation (2), Probability of the magnetic effect of the q^{th} household, $Pr\left(Mg_q\right)$ can be calculated.

$$Pr\left(Mg_q\right) = 1/\left[1 + exp\left\{-\left(\sum_{k=1}^{n} \beta_k x_{ik} + \varepsilon_i\right)\right\}\right] \quad (2)$$

To identify Tn_i of a randomly selected households, they were asked to identify their tension level in the scale from one to five, where one means minimum and five means maximum tension. Using equation (3) and taking previously stated tension level (ordinal data) as the dependent variable the predicted category for q^{th} household, ($\omega\left(Tn_q\right)$) was identified.

$$log\left(\frac{\gamma_{ij}}{1-\gamma_{ij}}\right) = \theta_j - \sum_{k=1}^{n} \beta_k x_{ik} \quad (3)$$

Where, γ_{ij} = cumulative probability of j^{th} category for i^{th} case

θ_j = threshold parameter for the j^{th} category

The family (q) can tolerate up to a certain limit, η_q (threshold limit) of the tension led probability to move out, $Pr\left(Mov_q\right)$ level. The family may decide to move out of current location when, $Pr\left(Mov_q\right) \geq \eta_q$. By taking $Pr\left(Mg_q\right)$, $\omega\left(Tn_q\right)$ and $Pr(Ab_q)$ as the independent variable and "possibility to move out of current location" for q^{th} household, Mov_q as dependent variable; probability to move out of current location, $Pr\left(Mov_q\right)$ was calculated by using equation (4).

$$Pr\left(Mov_q\right) = 1/\left[1+exp\left\{-\left(\beta_1 Pr\left(Av_q\right)+\beta_2 Pr\left(Mg_q\right)+\beta_3 \omega\left(Tn_q\right)+\varepsilon_i\right)\right\}\right] \quad (4)$$

All these models are already well developed and well accepted by the scientists. Most importantly, the model suits the data of this study. This kind of multi-tired models can be easily formulated using structural equation. However, this model cannot be explained properly. Some other options are neural network and Support Vector Machine (SVM). Unfortunately, both these models are very tough to understand for the readers. On the contrary, the proposed two-step model is easy to understand and interpret.

Data Consideration

Several socio-economic, political and environmental factors can influence the decision of the people to move out of current location. These predictor variables are grouped in three categories; i.e., (1) social variables (2) political variables and (3) economic variables. Of course, some other demographic variables also need to be accommodated.

The sample was divided into three income groups; (i.e. low income group, middle income group and higher income group). Family income below US$ 95 was defined as the low income earning group. The income groups of US$ 95 to US$ 163 and US$ 163 upwards are defined as the middle and higher income group respectively. Table 1 shows the income status of these three income groups. Household's probability to move out of existing location is a function of their ability to move out, tension level and magnetic force. All the variables are also divided into three groups to determine their effects on ability, magnetism and tension. Table 2 shows the listing of the variables.

Table 1: Income status of different income groups in US dollar

Income Groups	Mean	Standard Deviation
Higher Income	208.33	25.32
Middle income	110.48	13.05
Low Income	71.11	12.14
Total	91.39	32.59

Source: Field survey, 2005

For the simplicity of the research, the socio-political variables are grouped under four sub-categories. This is because there are hundreds of variables under these two categories. In addition, it is difficult to control these variables while doing the regression analysis. The basis of the subcategories is the extent or severity of the problem. Both social and political problems use to intensity the tension of the householders that forces them to move out of current location. The subcategories of the political variables are:

1. No significant problem (Noise and minimum mental pressure)
2. Forced politics (Moderate mental pressure)
3. Political pressure to do something
4. Political terrorism (Bombing, murder etc.)

No respondent identified the secondary impacts of political activities like strike, road blocking, picketing and police harassment in the public gathering etc. as a determining factor for the household mobility. Henceforth, secondary impacts were not taken into consideration.

The sub categories of the social problems are as follows:

1. Unsocial and non-friendly behavior of the people
2. Clash with the neighbors
3. Threat and tension
4. Terrorism and murders

Households with a male decision-maker are the norm in Bangladesh, and women tend only to become the decision-maker following the death of the husband, divorce, separation, abandonment, or if the husband has temporarily migrated. Moreover, male household heads have greater control; over the resource of the family and decision making power of the female heads are not that strong in comparison to the male heads (Helen Keller International, 2001). Hence, sex of the household head is one of the basic determinants of the mobility related decision making. It is generally argued that unskilled male-headed households have higher ability to move out than that of the female-headed households. Because of the higher physical ability and less demand in the skilled job market, unskilled male-headed households usually earn more than their female counterpart does. For the skilled household heads, sex is not at all a determining factor for the mobility of the household. Again, several literatures show that the age of the households head, who is the principle decision maker is a basic determinant of the mobility. It is seen that the households with younger heads are more mobile than that of the aged heads (Houser, 2005). Hence, age sometimes stimulates ability and sometimes it acts as a magnetic force. 55+ years of age of the household heads have a tendency to settle down in some place; i.e., this age acts as the magnetic force.

The number of family members is also an influencing factor for the decision making process of the family. Through influencing the per capita services and facilities, the higher number of family members would create significant pressure on the decision making process. Income and expenditure are the most dominant factors as these define the poverty through influencing the consumption of the services and utility facilities and so on. Households without children are more capable of moving out and higher number of children forces people to stay at the current location.

More than one third of the income of the people is spent for house rent. House rent is considered as a separate variable to increase the tension level. The occupation pattern and education are the determinants of the income. Through influencing the personal preference, Income, occupation and employment can influence the tension level. With the increased distance of the working place from the house, the transport cost also increases. It is considered one of the most determining factors of the mobility pattern of the households.

Education is also one of the major determinants of the socio-economic conditions. Generally, highly educated people usually enjoy better lifestyle in comparison to the less educated people. In Bangladesh, there are three types of educational system; i.e., (1) general education, (2) technical education, and (3) Madrasa education (Islamic education). It is difficult to categorize the educational attainment in a simple manner. For the simplicity of the research, the "years spent for education" is taken as the predictor for the tension level. With the increase of the number of years spent for education, the ability to move out also increase and vice-versa.

Bangladesh is a predominantly Muslim country and religion is the basic determinant for being minority. In the urban areas of Bangladesh, especially in Khulna city, there is no evidence of conflicts between the minority and non-minority groups. However, still just to analyze the effect of the ethnic minority on the mobility pattern, the religion is also taken as a predictor variable to justify the tension level.

With the increase of the number of years spent in a community, the keenness or intimacy with the neighbors also increases, that act as a magnetic force. However, sometimes this keenness is shattered by the poverty and socio-political instability. Some other variables like land value, tenancy pattern, legal status of the residents etc. are very useful to crosscheck the validity of the answers of the previously stated questions. The area per person, how many times the family has moved in the last couple of years, distance for utility services and facilities are some of the basic determinants of the mobility pattern of the households which demanded their incorporation in the questionnaire.

Table 2: List of the dependent variables with respect to the tension level, ability to move out and magnetic force

Independent variables		
Tension level	Ability to move out	Magnetic force
Religion of the respondent (Muslim or non-Muslim)	Family information	Family information
Family information	sex of the household head	age of the household head
Years spent for education	age of the household head	55 to 65
0-5 years	18 to 24	65 or over
6-10 years	25 to 34	Employment pattern
Illiterate	35 to 44	Formal
Number of family member	45 to 55	Tenancy pattern
House rent	Years spent for education	Owned
Tenancy pattern	11-12 years	Duration to stay in this place (yrs.)
Rented	13-14 years	Has children
None	15+	
Distances from services and facilities	Number of income earning family members	
Educational institute (meter)	Household movement in the last five years	
Health institute (meter)		
Water supply (meter)		

Bazzar (meter)		
Employment pattern		
Informal and temporary		
Distance from working place		
Illegality		
Political problem		
Noise		
Forced politics		
Pressure to do something		
Politics led Terrorism and murder		
Social Problem		
Unsocial behavior of the people		
Clash with the neighbors		
Threat and tension		
Terrorism and murders		
Area per person per sq. ft.		
Difference between income and expenditure		

Results and Discussion

The meaning of a logistic regression coefficient is not as straightforward as that of a linear regression coefficient. Hence, for the convenience of the interpretation, the results of the binary logistic regression models are presented in the form of odds ratio. Odds ratio represents the ratio-change in the odds of the event of interest for a one-unit change in the predictor. For the sake of interpretation and analysis, the result of the ordinal logistic regression is presented in the form of positive and negative coefficient. In this case, the discrete variable was used as it is. Positive coefficients of the ordinal logistic regression indicate positive relationships between predictors and outcome and vise-versa. The descriptive statistics of the variables used in the database are stated in Table 4. Before analyzing the process of how poverty is influencing the internal mobility pattern of Khulna city, it is very important to know whether poverty has any impact over the mobility pattern of the non-slum dwelling people living close to the slums. Table 3 answering this question, shows the result of the binary logistic regression to depict the relationship between the PPZs and the probability to move out of current location (out migration) with statistical controls.

All income groups reacted negatively to the presence of the PPZs close to their house. Relatively higher income group have statistically more significant (95 to 99% confidence level) effect of the presence of the slums on their mobility pattern It is also clear that squatters have more significant impact than the slums on the higher income group (the odds ratio for slums and squatters are 1.89 and 4.23 respectively). This is because the incidence of poverty is relatively higher in squatter settlements that associate the other symptoms of poverty like crime, social and political unrest etc. The low income groups living outside of PPZs also have relatively higher probability to move out of current location (for slums and squatters the statistics are 1.07 and 1.21 respectively) though the reason is totally different. It is difficult for these people to stay at the current location (out side of the PPZs) with their low income. They may want to move into the PPZs to minimize the house

rent and service charge. Therefore, PPZs are not only attracting the lower income group but also forcing the higher income group to go away from the PPZs to achieve homogeneity in the spatial socio-economic conditions. The situation contradicts with the result of the Freeman's (2003; p. 122) research on AHD (Assisted Housing Development) where he stated "AHDs typically do not exert any influence on the probability of non-poor householders leaving a neighborhood".

Table 3: Impact of slums and squatters over the mobility pattern of different income groups living outside the PPZs

Independent Variable (Presence of slums and squatters close to the house)	Dependent Variable: Possibility to move out of current location		
	Income groups		
	Low income group	Middle income group	High income group
Slum	1.07**	1.67***	1.89***
Squatters	1.21*	1.90**	4.23**

*$P<$ 0.10. **$P<$ 0.05. ***$P<$ 0.01.

As stated earlier, most of the families of Bangladesh are male headed. In addition, sex seems to be an impact-less player in the game of neighborhood mobility (Table 5). Age of the household head is one of the major determining criteria of the mobility pattern. Household heads aged between 25 to 34 and between 35 to 44 of all income groups show relatively higher ability to move out with statistical significance. There may be so many reasons behind this. Most of these households are nuclear and usually the number of family members does not exceed four. As the households are of working age, these families are financially relatively in a better condition than others are. Hence, these families are more capable of moving out of current location. Moreover, the household heads of this age group are especially vulnerable to political and social unrest. All these factors contribute to the increased ability to move out of these age groups. On the other hand, higher age groups (55+) are positively influencing the magnetic effect with sufficient statistical control (Table 6).

The educational status categorized as illiterate and low educated (0 to 5 years of education) positively affect the tension level with great statistical significance (Table 7). Usually, the illiterate people have no demand in the skilled labor market or highly paid jobs. The mismatch between the income and expenditure use to increase the tension level of these groups of people. In search for a place of relatively low living expenditure, the illiterate low income groups want to move out of the current location. The potential place would certainly be the PPZs or some other potential places for PPZs which is not physically so sound for living. Six to ten years education exerts no impact on the mobility pattern on any income group (Table 7). This level of education may not be able to create any significant impact on the socio-economic conditions of the people. On the other hand, higher and middle income group with fifteen or more years of education have statistically significant impact on the ability to move out (Table 5). Highly educated low income group also have a higher ability of out migration with high statistical significance (odds ratio is 12.19). The mismatch between their social and economic life may have made them isolated from the others. This needs further research.

Table 4: Means and standard deviation of the variables used in the regression analysis

Variables	Income groups						Total	
	Low		Middle		Higher			
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Dependent Variables								
Possibility to move out	0.65		0.59		0.68		0.51	
Tension level	3.21		2.76		2.41		2.65	
Ability to move out	0.18		0.68		0.89		0.47	
Magnetic effect	0.40		0.47		0.50		0.43	
Predictor Variables								
Religion of the respondent	0.82		0.89		0.85		0.87	
Family information								
sex of the household head	0.77		0.81		0.80		0.91	
age of the household head								
18-24 years	0.03		0.06		0.08		0.02	
25-34 years	0.32		0.09		0.11		0.22	
35-44 years	0.33		0.17		0.34		0.3	
45-55 years	0.24		0.21		0.26		0.22	
56-65 years	0.05		0.35		0.16		0.18	
66+ years	0.03		0.12		0.05		0.06	
Years spent for education								
0-5 years	0.25		0.09		0.05		0.18	
6-10 years	0.12		0.26		0.11		0.29	
11-12 years	0.25		0.44		0.13		0.3	
13-14 years	0.03		0.06		0.16		0.06	
15+	0.21		0.12		0.47		0.08	
Illiterate	0.13		0.03		0.08		0.09	
No. of income earning family members	1.08	0.28	1.09	0.29	1.17	0.41	1.09	0.29
Family member	4.82	1.31	5.03	1.34	5.83	1.47	4.95	1.34
Has Children	0.73		0.73		0.83		0.79	
House rent	666.67	283.85	1406.76	590.01	2570.00	530.28	1032.50	671.37
Illegality	0.26		0.10		0.05		0.17	
Distances from services and facilities								
Educational institute (meter)	1807.50	1368.87	2058.82	1434.24	1750.00	880.34	1889.50	1362.58
Health institute (meter)	2616.67	1424.27	2632.35	1504.08	1500.00	632.46	2555.00	1433.54
Water supply (meter)	102.75	113.03	70.59	120.03	50.00	122.47	88.65	116.18
Bazzar (meter)	2858.33	1402.45	1879.06	1363.93	2833.33	1722.40	2530.00	1466.49
Employment pattern								
Formal	0.08		0.44		0.67		0.24	
Informal and temporary	0.92		0.56		0.33		0.76	
Tenancy pattern								

Rented	0.75		0.81		0.73		0.78	
Owned	0.03		0.07		0.19		0.06	
None	0.22		0.12		0.08		0.16	
Duration of stay in this place (years)	2.84	2.00	4.59	3.68	5.50	3.83	3.59	2.92
Distance from working place	4280.00	2110.25	4338.24	2662.08	4250.00	1332.29	4298.00	2259.79
Political problem								
Noise	0.30		0.29		0.33		0.30	
Forced	0.18		0.29		0.21		0.21	
Pressure	0.07		0.06		0.17		0.07	
Terrorism	0.02		0.06		0.17		0.04	
Social Problem								
Unsocial behavior	0.35		0.53		0.50		0.42	
Clash with the neighbors	0.25		0.21		0.33		0.24	
Threat and tension	0.12		0.12		0.13		0.11	
Terrorism and murders	0.05		0.11		0.17		0.03	
Area per person (sq. ft.)	12.27	3.03	16.29	5.54	28.00	8.95	17.12	4.77
Number of movement in the last 5 yrs.	2.53	2.26	1.53	1.40	1.17	1.33	2.11	2.02
Difference between income and exp.	1166.72	744.57	1291.15	968.30	2278.33	2057.58	1275.72	961.74

Table 5: Relationship between pocket poverty and the ability of out migration of the people living close to the pocket poverty zone (PPZ) with statistical significance

Predictor Variables	Dependent variable (Ability to move out of current location)							
	Income groups							
	Low income		Middle		Higher		Overall	
Family information								
sex of the household head	0.41		0.52		0.54		0.43	
age of the household head								
18 to 24	0.43		0.67	*	0.32	***	0.51	**
25 to 34	1.25	**	2.17	**	1.26	*	1.59	***
35 to 44	1.67	*	1.75	*	1.89	***	1.71	*
45 to 55	0.98		1.12		0.77		0.92	***
Years spent for education								
11-12 years	0.41	*	1.22	**	1.26	***	1.16	**
13-14 years	1.52	**	3.54	*	2.39	**	1.76	*
15+	12.19	**	32.45	*	61.47	*	23.92	**
Number of income earning family members	Dropped		0.96	*	3.15		1.56	
Household movement in the last five years	1.19	***	1.17	**	1.26		0.67	***

*$P<$ 0.10. **$P<$ 0.05. ***$P<$ 0.01.

Number of family members has proved to be a very strong determinant with statistical significant for the tension level of the lower income group (the statistics is 2.14 in Table 7). Low family income with relatively higher number of family members decreases the per capita income. At the same time through creating pressure on the area per person, expenditure pattern; the number of family members makes it impossible for the family to live in an expensive area and thus increases the tension level as well. The reflection of this argument is also seen for the families who have children. All the households of all income groups have reacted positively towards the magnetic force with 95 to 99% significance level (Table 6).

The number of income earning members is supposed to be a strong predictor for the ability (Table 5) as with the increase of the number of the unskilled income earners in a family, the family becomes increasingly financially solvent, which increases the capacity to move out of current location in search for a better living environment. On the contrary, this argument may not be true for the skilled labor force. Nevertheless, surprisingly the numbers of income earning members have no significant influence over the ability of out-migration (the odds ration for the middle and higher income group are 0.96 and 3.15 respectively but the value 3.15 is not statistically significant in table 5). Most of the families with more than one income earning member are joint families with higher number of family members that neutralizes the advantages of having more than one income earners.

Table 6: Relationship between pocket poverty and the magnetic force of out migration of the people living close to the PPZ with statistical significance

Predictor Variables	Dependent variable (Magnetic force)							
	Income groups							
	Low income		Middle		Higher		Overall	
Family information								
age of the household head								
55 to 65	0.97		1.78	***	1.56	**	1.23	**
65 or over	1.53	**	2.46	*	1.41	*	1.36	**
Employment pattern								
Formal	1.23	**	1.61	*	0.96	***	1.17	*
Tenancy pattern								
Owned	Dropped		0.41		1.88	*	1.21	**
Duration to stay in this place (years)	0.67	*	0.83	*	0.95		0.72	
Has children	1.76	**	1.61	**	1.42	***	1.57	**

*$P<$ 0.10. **$P<$ 0.05. ***$P<$ 0.01.

On an average, the lower income group use to pay 30 percent of their monthly income as house rent (Barkat, 1997). Due to the higher crime rate, unstable social and economic conditions, the house rent close to the slums is relatively very low that neutralizes the effect of the house rent on the tension of the households of the lower income group. Nevertheless, the situation is a bit different for the middle and higher income groups (the statistics are 0.51 and 0.35 for middle and higher income group respectively in Table 7). The low house rent sometimes attracts the poor people from other areas as well and thus by using the private land, the slums use to spread around

its core area. For the squatters, the situation is a bit different. Generally, the area of the squatters is predetermined. Nevertheless, squatters can also spread out of the fixed area by using the low house rent of the privately owned land to form a big slum with an illegal origin (squatter).

Usually renters are more mobile than that of the house owners. The situation is also same for the people living close to the PPZs. Renters of all income groups are positively sensitive to the tension level with statistical significance (Table 7). As stated earlier, the higher income group is much more sensitive to the PPZs than others are. Land ownership of all ages have a neutral effect on the magnetic force, i.e., even the land lords of the higher income group are highly mobile (Table 6). The illegal occupants are always under the threat of eviction. Moreover, illegal occupants are usually isolated outside the squatter's area. This social exclusion along with the threat of eviction increases the tension level of the middle and higher income group. However, the effect of the PPZs on the tension level of the illegal occupants is not so clear. Nonetheless, these people are quite vulnerable to the terrorism originated from the PPZs. This is also not the well justified reason behind the positive effect of the illegality on the tension level (Table 7).

Table 7: Relationship between pocket poverty and the tension level of the people living close to the PPZs with statistical significance

Predictor Variables	Dependent variable (Tension level)							
	Income groups							
	Low income		Middle income		Higher income		Overall	
Religion of the respondent (Muslim or non-Muslim)	0.08	*	-0.24		-0.31	*	0.23	*
Family information								
Years spent for education								
0-5 years	1.58	**	0.88	*	-0.31	**	1.52	***
6-10 years	Dropped		0.21		0.31		0.09	
Illiterate	3.12	*	-1.61	*	0.14		2.60	**
Number of family member	2.14	**	0.11		0.56	*	0.84	
House rent	0.76		0.51	*	0.32	**	0.59	**
Tenancy pattern								
Rented	0.92	**	0.76	*	2.56	*	1.59	**
None	2.13	*	-1.97		Dropped		1.12	**
Distances from services and facilities								
Educational institute (meter)	0.41	*	1.37	***	2.12	*	1.14	*
Health institute (meter)	1.23	**	0.73	*	1.86	*	1.03	
Water supply (meter)	2.76	***	0.78		0.19	***	0.71	**
Bazzar (meter)	1.11		1.16	*	2.18	**	1.51	
Employment pattern								
Informal and temporary	3.39	**	1.11	*	0.67		1.43	**
Distance from working place	0.85	*	1.17	**	2.12	***	1.45	**
Illegality	Dropped		1.36	**	1.23	*	1.11	**
Political problem								
Noise	0.51	*	1.11	**	-0.42		1.91	*
Forced politics	-3.31		2.91	**	1.87	***	1.06	**

Pressure to do something	1.39	***	1.49	***	3.91	***	1.41	*
Politics led Terrorism and murder	2.41	**	1.71	**	2.51	***	1.34	***
Social Problem								
Unsocial behavior of the people	-0.27	***	-0.41	*	-0.67	***	-0.37	***
Clash with the neighbors	0.91	**	-0.17		1.24	**	0.76	***
Threat and tension	1.13	*	3.14	**	0.89	***	1.13	**
Terrorism and murders	-0.41	**	-0.91	***	1.11	***	-0.47	***
Area per person	1.97	**	1.17	*	2.19		1.56	*
Difference between income and expenditure	-0.87	*	-1.24	**	1.45	*	-0.54	*

*$P<$ 0.10. **$P<$ 0.05. ***$P<$ 0.01.

Time spent in the current location is one of the major determinants of the mobility pattern. With the increase of the time, the social ties with the neighbors also increases, which people may not want to break. Consequently, duration to stay in the current location is supposed to be a strong predictor for the magnetic effect. In this case, the situations seem to be reverse (the statistics for poor, middle and higher income group are 0.67. 0.83 and 0.72 respectively). The social and political tension overrides the social cohesion and force people to leave the current location. However, this process is not statistically so strong (Table 6).

Social and political problem are the strongest determinants determining the tension of the people living close to the PPZs. Almost all social and political indicators are influencing all income groups in higher extent with higher statistical significance. PPZs are often criticized to accommodate terrorists, political activists and criminals, and there is little disagreement in the scholarly articles about this (Kochanek, 2000; Peiris, 1998; UN-HABITAT, 2003). At the same time, there is almost no disagreement that the poor people use to be the main victim of these terrorisms and crimes (UN-HABITAT, 2003). The politics led terrorism and murders do indeed have statistically significant effects with 95% confidence level for the low income group. The situation is almost same for the middle and higher income group as well (Table 7). The muscle power of the local political leaders turns the local people into their bondman. Generally, people are always under threat of being murdered and assaulted if they violate any of the instructions instructed by the local political leaders. Sometimes these political leaders force the people to participate in their political party's campaign that creates tremendous mental pressure. The model shows that the political pressure to do something have statistically significant effects on all income groups with 99% statistical significance. The tension of the higher income group is very sensitive to the forced politics and political pressure (Table 7). Noise due to the political activities seems to be quite influential for the tension level of the lower and middle income group.

Clash with the neighbor accompanied by the threat and tension are the statistically strongest social predictors that are influencing the tension level of the low and high income people living close to the slums but not in the slum (Table 7). It is not clear whether or not slums and squatters have any influence on the clash with the neighbor. Perhaps the economic hardship shatters the social togetherness that lead to the social unrest. As stated earlier, PPZs accommodate the criminals, wide-spreading the crime incidence in the surrounding neighborhoods. The threat and tension may be the result of this crime. The middle income families are statistically extremely vulnerable to the social threat and tension originated from the slum as well with 95% confidence level (Table 7).

The low income and middle income households provides no evidence of the relationship between the difference between the income and expenditure and the tension (Table 7), while the number of moves of the households in the last five years do exhibit statistically strong relationship with the ability of the lower and middle income households (Table 5). Higher number of movements of the

household does not only show the lower threshold of the tolerance of the tension or stretch among the households but also it shows the effect of the slums on the mobility pattern when it is analyzed with respect to the economic groups. The lower income groups usually have a higher threshold with higher number of moves (Table 3), because they always search for a better place to live but due to the economic constraints, they cannot live far away from the PPZs as the house rent will become unaffordable for them. Area per person does exhibit statistically significant effect on the tension level with 90% confidence level for the middle income group but its relevance with the slums is not clear (Table 7). It is also an important factor determining the threshold limit.

The high and middle income group show higher extent of sensitivity with 90 to 95% significance level to increase the tension level (Table 7). However, interestingly, there is almost no difference in the mean distance of the working place from the households among different income levels (Table 3). The transport infrastructure and mass transportation system is not well developed in Bangladesh, consequently the per head transport cost use to be very high. Different income groups use to use different transport modes with different fare rate. This could be the main reason for this.

Distances from educational institute along with Bazaar are dominant determinants for the tension level of the middle and higher income group. On the other hand, distance from health center and water supply are important for the lower income group (Table 7). However, distance from services and facilities use to reduce with the increase of the income level (Table 3).

Informal and temporary employment seems to be very important factor to increase the tension level of the lower and middle income group (Table 7). Due to the tendencies of the people to live close to the working place, with the change of the employment, the location of the residences also, use to change. On the contrary, formal employments have fixed working place which acts as one of the most important determinant for the magnetic force with 90 to 99% statistical significance (Table 6).

As stated earlier, hypothetically ability and tension should have positive effect and magnetic effect should have negative impact on the probability to move out. Nevertheless, interestingly, magnetic effect also has positive relationship with the lower income group's possibility to move out with statistical significance (please see Table 08). The real reason of this kind of phenomenon is not so clear but tension may have shattered the effect of magnetic force. Moreover, more than 90% of the household heads of the lower income group are employed in the informal and temporary jobs. In search for a better job and also to live in close proximity to the location of the job, these people are forced to change their residents over and over again. The effect of the magnetic force is not that much severe for these people. Ability and tension level are positively related with the possibility of out-migration of the poor people with 90 to 95% significance.

Ability and the tension level are showing positive effect on the possibility to move out of current location for the middle and higher income group respectively (Table 8). As predicted, magnetic effect does not seem to be positively related to the possibility to move out for these income groups. The higher income group does not seem to be aware of their ability.

Table 8: Relationship between people's possibility to move out and the ability of out migration, Tension level and Magnetic force with statistical significance

Predictor Variables	Dependent variable (Possibility to move out of current location)							
	Income groups							
	Low		Middle		Higher		Overall	
Ability to move out (Probability)	1.09	**	1.13	*	0.89		1.01	**
Predicted Tension level	2.65	*	3.11		2.17	***	1.64	*
Magnetic force (Probability)	1.61	***	0.87	**	0.29	*	0.69	***

*$P<$ 0.10. **$P<$ 0.05. ***$P<$ 0.01.

The Traditional Model

The final out-put of the two-step model is the probability of out migration, which can be calculated also by using the binary logistic regression between the "possibility to move out" (dependent variable) and all the independent variables stated in Table 05, 06 and 07. This is the usual process adopted widely all over the world. However, the advantage of using this two-step model over the traditional logistic regression based models is three-fold. *Firstly*, by taking the possibility to move out of current location as a function of the ability, magnetism and tension level, this two-step model has proposed an excellent feature of representing different aspects of out-migration related process. Through this model the extent of influence of ability, magnetism and tension on the probability to move out of current location can be identified, that makes the process of mobility crystal clear. *Secondly*, most of the socio-economic variables use to maintain huge co-linearity among them. While running the traditional regression, a major portion of the variables are dropped due to co-linearity. This makes the whole process less effective and less representative to the fact. The relationship between the income and house rent can be taken as a canonical example. As the variable, "income" maintains correlations with many variables, by dividing the whole sample in three income groups based on their income, the effect of the co-linearity was reduced substantially. In this two-step model, the variables are divided into three categories representing the ability, magnetic effect and tension level. This division of the variables reduces the effect of co-linearity, making this model more representative to the fact. At the same time, this makes the study more comprehensive. *Thirdly,* through this model, the nature and extent of ties of different variables with different aspect of mobility (ability, magnetism and tension) can be easily identified. This process gives this model more holistic dimension through making the analysis more specific and more detailed. However, for the sake of comparison between the two-step approach and traditional approach; the regression result of the traditional approach is shown in the Table 9.

The result is quite identical. More than 25 % variables are dropped due to co-linearity. Still the result shows many logical points. As usual, the socio-political problems were identified as the major determinant for the probability to move out of current location with 90 to 99% confidence level for all income groups. 25-34 year's age group for the low income group, 18-24 years and 35-44 years age group for the middle income group shows positive effect on the probability of out-migration. Although all these results are very much logical as it is discussed earlier but it does not show the variable's ties towards ability, magnetism or the tension.

The lower income group with 6 to 12 years education has positive effect on the probability to move out; although 11 to 12 years education level does not represent positive effect on the ability to move out (Table 5). Middle income group with 13 to 14 years education shows positive relationship with the probability to move out, as it is also seen for the ability to move out (please see Table 5). Although illegality is responsible for the increased tension level (Table 7); but illegal residents do not want to change their house. Because, leaving the current house means losing the self-belongingness to that place to a large extent. This result also proves the essence of interpreting the result of two-step model along with the traditional model.

Table 9: Relationship between people's possibility to move out and the independent variables

Predictor Variables	Dependent variable (Possibility to move out of current location)							
	Income groups							
	Low		Middle		Higher		Overall	
Religion of the respondent	0.34		0.54		Dropped		Dropped	
Family information								
sex of the household head	0.33		0.45		0.32		0.42	
age of the household head								
18-24 years	Dropped		1.41	*	0.29		Dropped	
25-34 years	1.02		1.09		0.98		0.92	*
35-44 years	Dropped		1.77		1.81		1.02	
45-55 years	Dropped		Dropped		Dropped		Dropped	
56-65 years	0.47		Dropped		Dropped		Dropped	
66+ years	Dropped		Dropped		Dropped		Dropped	
Years spent for education								
0-5 years	Dropped		0.08	**	0.21		Dropped	
6-10 years	1.21		Dropped		0.55		1.07	**
11-12 years	2.09	*	Dropped		0.57		1.29	
13-14 years	1.15		1.12		0.88	*	1.07	
15+	Dropped		Dropped		0.46		1.61	
Illiterate	Dropped		0.79		0.35		0.18	
No. of income earning family members	0.83	*	1.22		Dropped		1.41	
Family member	0.91		0.66		0.71	*	0.89	
Has Children	0.65		0.72		0.24		0.63	*
House rent	1.26		Dropped		1.39		1.71	
Illegality	0.78		0.81		0.92		0.87	
Distances from services and facilities								
Educational institute (meter)	0.68		Dropped		1.87	*	1.23	*
Health institute (meter)	1.23		1.07		1.88	**	1.52	
Water supply (meter)	2.17		3.29	*	3.79	**	1.77	
Bazzar (meter)	0.19		0.81		1.01		0.91	
Employment pattern								
Formal	0.87		Dropped		1.05		Dropped	
Tenancy pattern								
Rented	Dropped		1.23		0.97		Dropped	
Owned	Dropped		Dropped		0.09		0.22	
Duration of stay in this place (years)	1.32	*	0.98		0.67	*	0.73	*

Distance from working place	Dropped		0.73		1.31	**	Dropped	
Political problem								
Noise	0.75	*	0.89		1.34		0.91	
Forced	2.56	**	3.19	*	1.41	*	2.12	*
Pressure	2.17	*	1.77		2.01	**	1.87	
Terrorism	1.26		1.64	*	2.18		1.59	
Social Problem								
Unsocial behavior	0.99		1.22	*	3.11	*	1.51	
Clash with the neighbors	2.01	*	1.61		0.97		1.05	*
Threat and tension	2.66		4.21	*	2.44	**	2.08	
Terrorism and murders	3.77		2.12	**	1.65	*	2.11	
Area per person (sq. ft.)	1.21		Dropped		0.21	**	Dropped	
Number of movement in the last 5 yrs.	Dropped		1.32	*	Dropped		1.43	**
Difference between income and exp.	Dropped		Dropped		Dropped		Dropped	

*$P<$ 0.10. **$P<$ 0.05. ***$P<$ 0.01.

Policy Issues for Neighborhood Migration

Without eradicating the poverty, the problems of PPZs can not be solved. Moreover, as poverty is not at all a stand-alone problem, which can be solved over-night, and numerous actors are influencing the poverty incidence in the developing countries; people just cannot imagine a city without PPZs. Hence, a sustainable way of co-existence between the urban poor people and the other urbanites needs to be ensured. So far, PPZs were held responsible for the concentration of poverty in the developed nations. Now from a paper it has become quite clear that PPZs are not only responsible for the out-migration of the higher income group but also for the in-migration of the lower income group.

Nevertheless, the question is, in which extent the PPZs are influencing the in and out migration of the neighborhood? As stated earlier, the population of the major urban centers of Bangladesh is increasing more than 4% per annum mainly because of rural to urban migration. Due to the cost of movement in terms of money, time and other intangible factors like familiarity and social ties, the existing residents are supposed to have lower tendencies to move out of current location (Freeman, 2003). Hence, the new settlers are basically attracted to settle close to the slums. The out-migration of the higher income group should not be that much high in comparison to the in-migration of the poor people.

The socio-economic homogeneity has proved to be the main determinant for the neighborhood migration. It is because of this factor, the lower income group has a tendency to settle close to the PPZs and the higher income group has a tendency to move out for a better place to live.

Devising proper urban spatial and economic policy for the urbs of the developing nations is always a tough task as urban centers use to grow and change rapidly. Moreover, due to the lack of proper control measures, the PPZs cannot be controlled. The result is also quite severe. According to Rahman (1995) “the net result of growth on poverty condition is positive but the country is failing to gain the fruit of the growth due to the concentration of the poor people in some pocket areas”. Freeman (2003) while describing the impact of AHD said “Given the host of other

neighborhood effects that have been attributed to AHDs, including declining property values, increased crime and increased racial segregation, the notion that AHDs help concentrate poverty would serve to cement their reputation as LULU and invoke more vociferous NYMBYism at the prospect of their being placed in a neighborhood". The impact of PPZs on the property value is not so clear for Bangladesh. This needs to be researched rigorously. However, the social impacts of PPZs (like increased crime rate) are widely discussed issues.

Eviction of the PPZs is not at all a good solution. Rather, more focus should be on the spatial planning approach. Generally, PPZs use to develop close to the employment zone, where some vacant or under developed lands are available. Two approaches can be fruitful in this regard. Firstly, the poor people can be encouraged to live outside the PPZs through some subsidy and attractive services and facilities. Secondly, well focused land banking system supported by spatial control measures can not only protect the spreading nature of the PPZs but also a well planned residential pattern can be achieved through this.

A qualitative change has become essential for the Slum Improvement Projects (SIP). So far, most of the SIPs focused on the infrastructural development. However, the SIPs should be more employment focused and income oriented. Through economic development, the negative impact of the PPZs can be reduced substantially.

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