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Factors influencing migration of female workers: a case of Bangladesh

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Abstract

Unemployment and low wages prevailing in the domestic market pushes female workers to look for better employment abroad. Investment in the shape of remittance further builds human capital, financial capital, and the social capital. The aim of this study is to analyze the trend of Bangladeshi female migrant flow by time and destination. In addition, the study also makes assessment of (i) economic factors (macro and labor market indicators), (ii) demographic factors, and (iii) noneconomic factors, such as religion and distance forcing females to migrate. Time series data for the period 2000 to 2012 is employed to investigate the push and pull factors of female migration. The dynamic panel data approach, generalized method of moments (GMM), is used for estimation purpose. The study concludes that skilled enhancement is a basic need for unskilled migrant.
JEL Classification: F-22, J-16, J-71

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1 Introduction

Economic, demographic, and technological improvements have boosted the flow of migrants in the globalizing world. The flow though varies across countries, but the determinants of migration are more or less the same. Facts and figure from UN DESA (2013) shows that there were around 232 million international migrants spread all over the world. Out of the total, 59% are in developed and 41% in the developing regions—half of this represents female migrant workforce. Flow of migrant from south to south is near about 36% and from north to north is 35% while the flow from north to south is very low, around 6% only. Around 71% of the international migrants belong to the land of South. Further, international migrant stock by region shows that Europe has 70 million international migrants and Asia has 61 million international migrants while North America is absorbing 50 million international migrants.

More than 90% of migrations in the world have taken place for employment purpose; migrants move either alone or with their families. In terms of development, migrants contribute by sending remittance to their origin country, which leads to economic growth, while at destination, they fill the gaps in labor market. In the origin country, remittance resolves the financial constraint, generates economic activity, and reduces unemployment. Specifically for female migrants, it boosts confidence level and enhances empowerment. These benefits go along with the challenges like restricted

government rules and regulations, exploitation by visa processing agents, and low wages (ILO Report 2011).

Overall, the percentage of female migrants in the world is 49% or almost half (UN 2010). However, scholars agree that in the late 1970s, migration share has internationally moved around the male workers and the females were seen moving as wives and daughters, following their fathers and husbands. Since late 1990s, trend of migration has shifted in favor of female migrant worker. Data of the past six decades shows an increasing trend in flow of female migrant workers (see migration database of IOM and OECD). Table 1 depicts that migration of female workers increased annually, around 0.2% since 1960. Steadily growing female migrant share shows that it was 47.2% in 1970 and, in 2010, it rose to around 49%. Globally, the trend of female migrant workers has gradually risen.

Further, during the nineteenth century, British colonial system and other intra-imperial conditions have restricted females to migrate (McKeown 2004). Migration of females at that time was mainly due to the family migration. Females of the twentieth century have individual identity, and they move freely for employment and study purposes. Mostly, low-skilled female migrant workers belonging to Asian countries like Sri Lanka, Bangladesh, Indonesia, and Philippines are migrating to gulf countries like Saudi Arabia, UAE, Jordan, and Lebanon, despite several exploitation faced by them in these countries. Mobility of female workers from Asian countries to Gulf countries is mainly due to similarities in cultural and religious norms.

Furthermore, women in labor force are often engaged in informal sector or in the low-paid work. Lack of policies for protection of women is also among the main causes for their involvement in low-paid jobs, i.e., they survive with limited economic opportunities. Looking at the occupational groups, female workers are more vulnerable as they are usually engaged in domestic work providing services as maids, baby sitters, nurses, looking after old age people, etc.; low-skilled; uneducated; and unaware about the job conditions; especially, Asian female migrants from Bangladesh, India, and Sri-Lanka easily become the victim of exploitation. Severity of the exploitation varies; some are paid less than the work perform, some have excessive working hours, and some face physical and verbal abuse.

The main purpose of this study is to estimate the magnitude and trends of female migration flow for employment from Bangladesh to all over the world. The study also aims to estimate the factors influencing international migration of female workers from Bangladesh. Specifically, the study is determined to explore the impact of economic and noneconomic factors on female migration decision. Economic factors are further

Table 1 International female migration trend (1960–2010)

Years	% share of female migrant
1960	46.6
1970	47.2
1980	47.4
1990	47.9
2000	48.8
2010	49

Source: UN (2010)

subdivided into macroeconomic and labor market indicators while noneconomic factors include religion and distance. The analysis of this study is based on the annual time series data for the period 2000 to 2012.

The study contributes to the available literature by empirically estimating the determinants of migration using push and pull factors together in one model. The estimation is done using the data of the last 13 years and by applying the most sophisticated technique generalized method of moments (GMM). The system GMM is applied considering the issue that in Bangladesh where social and cultural norms have restricted female mobility, the decision of migration for work purpose heavily depends on the past experience of female migrants. The application of the time series data (showing trend) is compared across the destination, and exploring the determinants of female migration using GMM is to the best of the knowledge of author first time attempted, especially in the case of Bangladesh. The trend and results presented in the literature will be helpful for the policy makers to develop the migration policies related to female migrants.

The study is divided into the following sections: Section 2 presents the review of literature, Section 3 provides assessment of the trend of female migrant workers from Bangladesh by time, Section 4 discuses the methodology and provides estimation technique and detail about data employed, and Section 5 explores the factors influencing female migration in Bangladesh, while the last section provides conclusions and policy implications.

2 Review of literature

Ghosh (2009) discussed the recent trend of women migration nationally and internationally. His finding revealed that migration has positively impacted sending countries by increasing foreign exchange. Remittances bring improvement in health, education, generate investment, and reduce poverty. Neetha (2004) explored the positive and negative insight of migration concluding that female migrants specifically the domestic workers face a number of challenges related to low wages, long working hours, and harsh working conditions due to settlement and language problems. Mostly, it has been observed in the literature that women are better than men in terms of remitters and savers.

Islam et al. (2013) used the time series data and explored the socioeconomic impact of international migration on Bangladesh. Their results showed that co-integration exists between literacy rate and growth rate of remittance which improves the living standard. However, reduction in the level of poverty is sustainable only through formation of capital. The authors also pointed out that migration has not only opened the new economic opportunities but has also generated decision-making power especially among female workers.

Islam and Siddiqui (2010) explored the association between migration and sociodemographic characters by using the chi-square technique. Their finding revealed that the age at the time of marriage, education, religion, living conditions, and occupation status impact migration significantly.

Asis (2004) discussed the flow of migrants from low- to high-income countries. According to him, majority of the migrants enter through informal sources. About 80% of the illegal migrant belonged to the Asian countries like Bangladesh, India, and

Pakistan [The Economist (March 1998)]. Due to informal entrance, these females are easily trapped by the agencies. Mostly, females remained the target. Due to unawareness, the illegal female migrants often spend the rest of their lives in slavery.

Islam (2008) discussed that within Bangladesh, majority of female workers are engaged in garment factories, as care workers in the field of nursing. Country-wise overseas employment trend of migration from 2004 to 2009 shows that females are usually migrating to UAE, KSA, and the Middle East countries. Socioeconomic conditions and unemployment situation pushes the females to migrate.

Ullah (2007) showed that labor force participation rate of females in Bangladesh is high in contrast to overseas female migrant share in the selected Asian countries.[1] Ullah has applied both qualitative and quantitative techniques for the comparative analysis between Indonesia and Bangladesh. His study has highlighted that religion is more powerful indicator but has never restricted women migration from Indonesia. In Bangladesh, resistance to female migration occurred because of the social norms, illiteracy, language barriers, and Government policies.

Ullah (2012) using the gravity model revealed that the decision-making power has significant impact on migration. His estimation results indicated that religion and language constraint have more significant effect as compared to other factors. He emphasized on the role of powerful institutions for better manpower export.

Dustmann and Fabri (2003) considered communication skills or language proficiency especially for migrant workers as a tool to get better jobs in destination countries. Age, education, and duration of stay are considered as factors improving language proficiency at destination and proficiency or good command which improves employment opportunities. Authors point out that proficiency in language increased earning by 18 to 20%.

Countries like Sri Lanka and Philippines have higher level of education and thus face large demand of their workers abroad as compared to Bangladeshi women. Women in Bangladesh are surrounded by social norms and Government's restricted policies. Oishi (2002) approached the issue from three levels micro (individual level), macro (state level), and meso level (society level). The results show that decision-making power of female migrants plays an important role in the struggle of migration. The findings also showed that connection between micro and macro level is related to education, mobility, and employment. These are among the causes of international migration that leads to investment and development.

Dustman (1997) analyzed the behavior of migrant married female workers in the context of temporary and permanent migration. Temporary migrants have an opportunity to shift out in different labor market if their future expectation or plan does not match with the current labor market conditions in contrast to permanent migrants. The bivariate probit estimation technique indicated significant difference among the behavior of returnees between permanent and temporary migrants. The difference among permanent and temporary migrant behavior indicated that decision-making does matter in the process of permanent and temporary migration.

Focusing on Bangladesh, Siddiqui (2012) emphasized on importance of policies related to labor market. According to him, for the developing countries, migration remains a strong source for earning, not only for the migrants but also a source of generating foreign exchange reserves. The period for 2005 to 2010 proves that remittance is double

than the net income earned through the garment sector. Bangladesh is facing challenges like unemployment, poverty, low literacy rate, unbalanced economic indicators, and health issues.

Mayda (2010) focused on determinant of migration using demand and supply factors in 14 OECD[2] countries. The author found that income and income dispersion impacts migration. In addition, demographic, geographical, and cultural factors are also found to have significant effect. Estimation using panel data technique has explored both the push and pull factors. Major focus was given on host country's migration policies. The results indicated that less restrictive polices give positive pull effects.

Literature relating to FDI and remittance indicated that FDI brings numerous changes in the host countries. Flow of FDI brings capital, technological improvements, and growth; hence, it provides employment opportunities. This lowers the incentives for migration Alfaro et al. (2004).

Gravity model equation in international trade was introduced by Tinbergen (1962), who used this model to explain the theory that trade flow is mainly influenced by the economic size and distance between the two countries (trade between two countries is directly proportional to economic size and inversely proportional to the square of the distance). He also emphasized the importance of bilateral trade among two countries with respect to common borders, language, and common colonial regulations. The Tinbergen model was earlier used for trade only, but now, it is commonly applied on FDI inflow, migration and remittance flows, and other socioeconomic fields.

This study is based on flow of migration from the OECD countries. The author highlighted the network and welfare effects in origin as well as the destination countries. The study extensively explored the push and pull factors such as employment, income, cost of traveling, geographical, political, and the demographic factors. The results indicated that network effect gives positive impact on immigrant countries. Economic factors provide nonlinear impact and demographic factors vary by countries while geographic factors show negative impact on migration Pederson (2008).

3 Assessment of female migrant workers of Bangladesh

This section presents the pattern of female migration flow from Bangladesh. The purpose is to provide a detail assessment of female migrant workers, i.e., the proportion of female migrated for work purpose, where they are migrating and in what occupation they are mostly engaged in. The trend of migration is highlighted by time in order to analyze changes in the migration pattern in depth.

3.1 Overview of female Bangladeshi workers

In developing countries, due to insufficient jobs availability, informal employment has grown as against growth in formal sector (ILO Report 2011). Unskilled, less educated, and low-paid wage earners are largely concentrated in informal sector. Moreover, in Bangladesh, majority of female workers remain engage in the ready-made garments. This sector absorbs a large number of female labors which causes a decline in the wage ratio. Inequality in wages enforces female to migrate in order to earn better to improve their living standard.

3.2 Trend of Bangladeshi female migrant workers (2000–2012)

Women migration from Bangladesh started in 1980 when majority of the workforce migrated as professional workers like doctors, nurses, and teachers were allowed by the government to work abroad. Semi-skilled and less skilled workers are intentionally restricted till 2000. During 2000 to 2002, female migrant workers were almost 1%. In 2003, slight increment is evident due to relaxation given by the government, i.e., females having age of 35 years were allowed to migrate. In 2006, the age limit was further relaxed from 35 to 25 years. Migration further rose when ban was lifted for all occupational categories. However, in 2007–2008, the global economic crises and, in the Middle East, the construction process both affected the migration trend. But since 2009–2010, migration of female workforce showed an increasing trend (see Fig. 1).

3.3 Major destination for migrants

Migration pattern by destination shows that females are usually migrating to Gulf and Middle East countries, Lebanon and Saudi Arabia, where UAE are top recipient. The high demand of female Bangladeshi workers in these countries is due to common religious norms, but now, the trend is gradually changing and there are females which are moving towards other countries as well. Bangladeshi female workforce is also moving to South East countries like Jordan and Mauritius as well (BMET 2005). After 2006, females are migrating towards South East countries mainly due to the crises in Gulf countries. Overall migration since 2000 to 2013 has exceeded from 454,000 to 56,400 (BMET). Figure 2 shows that near about 31,345 females migrated to KSA (Kingdom of Saudi Arabia) while in UAE, 53,145 female workers departed. Lebanon is at top among the destination countries where 68,486 female Bangladeshi workers departed.

3.4 Category-wise migrant workforce

Internationally, labor migration from Bangladesh remained an important source of contract labor. Category-wise migrant can be divided into four (professional, skilled, semi-skilled, and less skilled workers) highlighted in Table 2. Professional workers were highly in demand in 2003 (BMET, 1976–2008). During the period 2000 to 2003, the ratio of professional workers among migrants slightly increased from 4.79 to 6.24% but

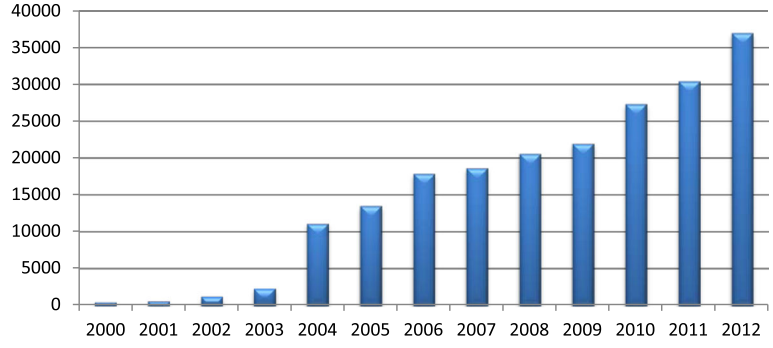

Fig. 1 Female migrant workers by time

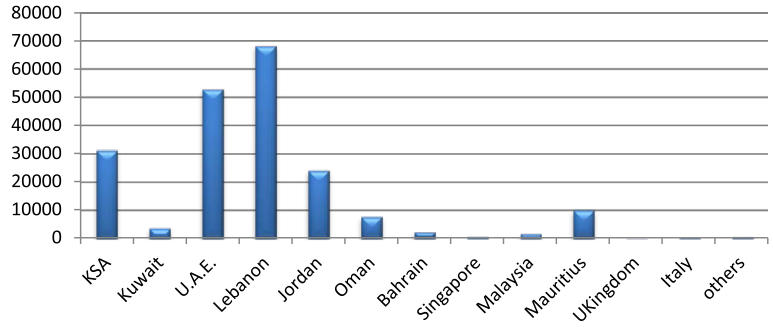

Fig. 2 Female migrant workers by destination

the proportion of skilled migrant workers declined from 44.72 to 29.32%. Migration of semi-skilled workers also declined as well. Among the four categories, demand for unskilled (less skilled) migrant workers has increased only from 38.59 to 52.93%.

During 2003–2006, the government of Bangladesh relaxed the age limit which has raised the migrant flow to 60.58%. Both the Global economic and Gulf crises in 2007–2008 though declined the rate of migration but have increased the demand of unskilled women migrant workers; this is evident from the data where the demand was around (71.58%) in 2010. The year 2010–2011 again showed a decline in migration, but in the year 2012, migration of unskilled worker again increased to 62%. According to the BMET, over the period 2000 to 2012, the demand for professional female workforce remained lowest (1.2%) while demand for semi-skilled female worker remained around 12.2%. Professional and semi-skilled workers remained less in demand as compared to skilled (31.2%) and less skilled (55.2%) workforce. The demand for less skilled (unskilled) workforce remained the highest as highlighted in Table 3.

Table 2 Migrant workforce by skill

Years	Professional workers	Percent	Skilled workers	Percent	Semi-skilled workers	Percent	Less skilled workers	Percent	Total
2000	10,669	4.79	99,606	44.7	26,461	11.88	85,950	38.59	222,747
2001	5940	3.14	42,742	22.62	30,702	16.25	109,581	57.98	189,007
2002	14,450	6.41	56,265	24.98	36,025	15.99	118,516	52.60	225,303
2003	15,862	6.24	74,530	29.32	29,236	11.5	134,562	52.93	254,237
2004	12,202	4.47	110,177	40.36	28,327	10.38	122,252	44.78	273,013
2005	1945	0.77	113,655	44.98	24,546	9.71	112,556	44.53	252,757
2006	925	0.24	115,468	30.27	33,965	8.90	231,158	60.58	381,555
2007	676	0.08	165,338	19.86	183,673	22.06	482,922	58.00	832,651
2008	1864	0.21	292,364	33.41	132,825	15.18	448,002	51.19	875,103
2009	1426	0.30	134,265	28.25	84,517	17.78	255,070	53.66	475,324
2010	387	0.10	90,621	23.19	20,016	5.12	279,678	71.58	390,730
2011	1192	0.21	229,149	40.34	28,729	5.06	308,992	54.39	568,107
2012	812	0.13	209,368	34.45	20,498	3.37	377,120	62.04	607,836

Source: BMET complied by author

Table 3 Migrant workers by profession

Year	Professional	Skilled	Semi-skilled	Less skilled
2000–2012	1.2%	31.2%	12.2%	55.2%

4 Methodology and data employed

The methodology of the paper provides a thorough discussion on factors influencing migration decision model to be estimated, followed by estimation technique, and finally, the data sources applied are discussed with some variable description.

The framework adopted is divided into three levels; see Fig. 3, i.e., how the economic, noneconomic, and demographic factors influence the flow of female migrant workers. Economic factors include macroeconomic and labor market indicators. The first macroeconomic factors is

$$\mathrm{emg}_{ijt} = f\left(\mathrm{mac}_{ijt}\right) \tag{1}$$

where emg_{ijt} shows the flow female workers from i origin (Bangladesh) to j destination countries in time t, while mac_{ijt} represents the macroeconomic conditions of origin and destination countries in time t. The macroeconomic conditions are reflected by real GDP per capita (PPP adjusted) and foreign direct investment. These factors are analyzed in the context of push (origin country characteristics) and the pull (destination country characteristics) factor theories of migration. Hence, if the effect of pull is negative, the effect of push could be positive.

For example, a decline in the GDP per capita of origin country indicates the deteriorating economic conditions leading to uncertainty in employment opportunities, hence pushes people to migrate while any improvement in the GDP per capita of destination will pull the workforce from origin country.

$$\mathrm{emg}_{\mathrm{ijt}} = \mathrm{f}\left(\mathrm{mac}_{\mathrm{ijt}},\ \mathrm{lab}_{\mathrm{ijt}}\right) \tag{2}$$

where lab_{ijt} represents the labor market conditions of origin i and destination j in time t. The indictors used here to explore the effect of labor market condition include employment to population ratio (used as proxy of unemployment), size of agriculture, manufacturing, and service sector. Though the effect of unemployment will be interesting to look at, but as most of the data on unemployment is missing across country or time, a proxy indicator, employment to population ratio is used to explore the effect of unemployment on migration decision. Negative impact of this proxy for origin means

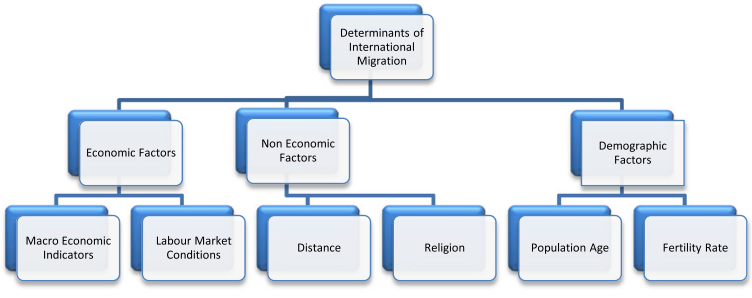

Fig. 3 Determinants of migration

the higher the ratio the higher will be the employment opportunities available leading to lower migration rate. In contrast, for destination country, the higher ratio means that it may discourage or instead attract female migrant workers as employment opportunities increase in the destination country. Encouragement or discouragement will be based on the sector where employment is expanding skilled or unskilled. Further, industrialization creates demand for skilled workers, while females are mostly unskilled; hence, in both origin and destination countries, industrialization will result in decline in demand for unskilled females. These females then seek employment in the informal sector as unskilled workers. Females usually migrate as domestic helpers. Overall industrialization in origin pushes females to migrate while in destination country, industrialization discourages the demand for unskilled female migrants. However, in destination country, industrialization may increase the demand of skilled native female workers. These skilled female workers (native) of destination country then seek domestic workers for child care, generating demand for unskilled migrant workers, specifically females.

$$\mathrm{emg}_{\mathrm{ijt}} = \mathrm{f}\left(\mathrm{mac}_{\mathrm{ijt}},\ \mathrm{lab}_{\mathrm{ijt}},\ \mathrm{nmac}_{\mathrm{ij}}\right) \tag{3}$$

where nmac_{ijt} represents the noneconomic factors influencing migration decision. These include distance between origin and the destination countries, measuring transportation cost, and religion. In Bangladesh, situation of female migrant workers is slightly different due to the Government policies and the social and cultural norms. Bangladeshi females usually seek work to Gulf and Middle East countries, such as Lebanon, Saudi Arabia, and UAE. The high demand of female Bangladeshi workers in these countries is due to common religious norms. Religion plays a major role for female workers in the scene that religion provides source of unity within the destination with respect to social norms. Further, the higher the distance the lower will be the migration rate as it increases the traveling cost which reduces the frequency of female visits to family.

$$\mathrm{emg}_{\mathrm{ijt}} = \mathrm{f}\left(\mathrm{mac}_{\mathrm{ijt}},\ \mathrm{lab}_{\mathrm{ijt}},\ \mathrm{nmac}_{\mathrm{ij}},\ \mathrm{dem}_{\mathrm{ijt}}\right) \tag{4}$$

where dem_{ijt} represents the demographic factors influencing migration decision. Demographic variable included in the study is fertility rate.

It is hypothesized that increase in population will create unemployment and burden the limited resources, hence foster migration from origin. While in the destination country, high fertility rate means that labor market may fail to absorb the flow of migrant workforce; hence, higher fertility rate will influence migration negatively. In sum, the impact of increase in population on migration decision will be positive for origin while negative for destination.

Finally, it can be started that decision regarding migration is highly influenced by the positive support of the family friends and relatives which also motivate females to take decision of migration. Past migrants, on the basis of their experience, facilitate how migrants share their experience, search job opportunities for others, and provide temporary shelter to them. In contrast, the bad experience of one female migrant may discourage others to take decision for migration. The high trafficking of female workers, harassment, and severe working conditions faced by females at the destination

country may de-motivate other females to migrate. Therefore, decision of migration mainly depends on the past experience of migrant workers especially in the case of females. Hence, in the model, lag-dependent variable of female flow of migrant workers is included. The hypothesis behind is that movement of new migrants depends on the past migrant decision. The final model therefore includes these migrant flows as well

$$\mathrm{emg}_{ijt} = \mathrm{f}\left(\mathrm{mac}_{ijt},\ \mathrm{lab}_{ijt},\ \mathrm{nmac}_{ij},\ \mathrm{dem}_{ijt},\ \mathrm{emg}_{t\ -\ 1ijt}\right) \tag{5}$$

4.1 Gravity model of migration

The above model of migration estimated on the basis of Newton's Gravitational Law (1687). According to which, two different forces between the two bodies are directly proportional to the size but inversely proportional to the square of the distance between them

$$M_{ij} = g \times \frac{P_i \times P_j}{D2_{ij}} \tag{6}$$

The modified law is referred as gravity model of migration. In the model, M_{ij} represents the migration flow from country i to j, while g in the model is the gravitational constant. P_1 and P_2 are the population in the two country and d is the distance. Migration between origin i to destination j remains directly related to the size of origin's and the destination's population which is inversely related to the square of the distance between the two. For our model, we used gravity model approach to find the determinants of female migration. The problem we faced in fully adopting the gravity model is nonavailability of the bilateral data on female migrant workforce. Keeping the limitation, the study has estimated the model by including macroeconomic, labor market, demographic, and gravity variables for the origin and destination countries altogether by simply focusing on the out migration from Bangladesh to the rest of the world.

The gravity model is hence modified to form a model of outflow of migrant workers from Bangladesh to the destination country by time.

$$\mathrm{emg}_{ijt} = \ \mathrm{B_O} + +\mathrm{B1}_{ijt}\sum_{U=1}^{4}\mathrm{macr}_{ijt} + \mathrm{B2}_{ijt}\sum_{V=1}^{3}\mathrm{lab}_{ijt} + \mathrm{B3}_{ijt}\sum_{W=1}^{2}\mathrm{dem}_{ijt} + \mathrm{B4dist}_{ij} + \mathrm{B5relg}_{ij} + \epsilon_i jt \tag{7}$$

For estimation purpose, the study has applied the system GMM technique. The choice of GMM is because of the hypothesis that migration decision of this year is based on decision taken in the past. However, for the robustness check, we have also estimated the fixed effects model [see results presented in Appendix 2 for robustness check], as well. Further in the equation, u, v, and w represent the number of macroeconomic, labor market, and demographic indicators, respectively, included in the model.

4.2 Estimation technique

Many economic issues are dynamic in the nature. These dynamic relationships are characterized by the presence of a lag-dependent variable among the regressors; because of the lagged variable, OLS is biased and inconsistent even if v_{it} are not serially correlated. Since y_{it} is a function of u_i, so is y_{it-1}. Anderson and Hsiao (1981)

suggested the first differencing in the model to get rid of the u_i and then using an IV method. However, this proposed method leads to consistent but not necessarily efficient estimates, because:

1. It does not make use of all available moment conditions.
2. It does not take into account the differenced structure on the residual disturbances Δv_{it}.

Arellano and Bond (1991) then proposed a more efficient estimation procedure. They argue that additional instruments can be obtained if one utilizes the orthogonality conditions which exist between the lagged values of y_{it} and v_{it}. It takes first difference to get rid of the individual effects and uses the past information of y_{it} as instruments.

To illustrate, we have used the following model:

$$y_{it} = \delta y_{i,t-1} + u_{it}$$

where $u_{it} = \mu_{it} + v_{it}$ with $\mu_{it} \sim iid\left(0\ \sigma_{\mu}^2\right)$ and $v_{it} \sim iid\ \left(0\ \sigma_{v}^2\right)$.

First, we took the difference to eliminate the individual effects:

$$y_{it} - y_{i,t-1} = \delta\left(y_{i,t-1} - y_{i,t-2}\right) + v_{it} - v_{i,t-1}$$

The first period where we can use an instrumental variable is $t = 3$, where we have

$$y_{i3} - y_{i2} = \delta(y_{i2} - y_{i1}) + (v_{i3} - v_{i2})$$

Here, y_{i1} is not correlated with the error and is therefore a valid instrument since it is correlated with $(y_{i2} - y_{i1})$ and not with $(v_{i3} - v_{i2})$. One period forward, we have

$$y_{i4} - y_{i3} = \delta(y_{i3} - y_{i2}) + (v_{i4} - v_{i3})$$

where y_{i1} and y_{i2} are valid instruments. Therefore, in period T, the set of valid instruments is $(y_{i1} \ldots (y_{1T-2}))$. But we still need to account for the differenced error term $(v_{it} - v_{i,t-1})$. See Appendix 1 for more details

4.3 Data collection procedure

For estimation purpose, the data of female migrant workforce is taken from Bangladesh Bureau of Manpower and Training (BMET). Demographic and other variables are collected from the secondary sources, such as the World Development Indicators (WDI), United Nation (UN), and CEPII (Research and Expertise on the World Economy). Time frame of the study consists of 13 years, from 2000 to 2012. The data is collected for 19 destination countries.

5 Factors influencing migration pattern of Bangladeshi women

The results reported in Table 4 show lag-dependent variable, i.e., the past decision of female migrants has significant positive effect on the current decision of migration. Migration rate of the last year influences the current amount of flow of migration. The past experience of female migrant is found motivating the current migrant to take decision of migration for better future of their own and of their family. Increase in the amount of remittance works as catalyst for other females in the family and community to migrate. Sometimes, females working abroad also help others to find job and get

Table 4 GMM—dynamic panel data estimation for Bangladesh

Determinants	Coefficient	*P* value
Pull factor		
Lag-dependent variable: log of female migrant flow	4.31	(0.00)*
Macroeconomic factors		
Log real gross domestic production per capita (ppp)	94.97	(0.01)*
Lag 1 of log real gross domestic product per capita (ppp)[a]	167.82	(0.01)*
Labor market factors		
Log agriculture sector value addition	53.77	(0.01)*
Log manufacturing sector value addition	−72.95	(0.01)*
Log service sector value addition	4.74	(0.59)
Employment to population ratio[b]	−36.37	(0.01)*
Labor force participation rate female[b]	52.02	(0.01)*
Demographic factors		
Log fertility rate	311.46	(0.01)*
Noneconomic factors		
Distance	−0.92	(0.01)*
Religion	−71.85	(0.24)
Push factor		
Macroeconomic factors		
Log real gross domestic product per capita (ppp)	−53.72	(0.09)***
Lag 2 of log real gross domestic product per capita (ppp)[a]	−60.39	(0.08)***
Labor market factors		
Agriculture sector value addition[b]	39.87	(0.03)**
Log manufacturing sector addition	22.07	(0.02)**
Log services sector value addition	28.86	(0.02)**
Log employment to population Ratio	90.91	(0.23)
Lag 1 of labor force participation rate female[a]	−8.58	(0.01)*
Demographic factors		
Log fertility rate	−148.30	(0.06)***
Number of observation	207	
Wald chi^2 (19)	423.97	
Probability >chi^2	0.00	
Sargan test of over identifying restrictions	3.78e−16	
Probability >chi^2	0.999	

Note: *, **, and *** represent significance at 1, 5, and 10% significance level, respectively
[a]Lag values are used to control endogeneity. Sargan test further confirms that instruments used are over identified
[b]Log values of some of the variables show insignificant impact, hence not included

settle. The coefficient of lag-dependent variable confirms that present decision of migrants is dependent on the past flow of migration. Precisely, 1% increase in the last year migration flow increases the flow of current migration rate by 4.3%.

As far as macroeconomic indicators are concerned, firstly, real GDP per capita of destination countries exerts positive and significant effect on female migration flow. The results show that a good economic environment attracts migrants. Precisely, 1% increases in the real GDP per capita increase the migrants flow by 95%.

Further, labor market indicators of destination countries show that size of agriculture sector has positive and significant effect while the manufacturing sector exerts negative and significant effect on migration. One percent increase in the size of agriculture and manufacturing sector causes an increase in migration by 53% and a decrease in migration by 73%, respectively. This could be because of the growing demand in destination countries for the females as unskilled workers rather as skilled labor in manufacturing sector.

Further, employment to population ratio is used as a proxy of unemployment ratio which shows significant but negative impact on migration. Another factor explaining labor market conditions showing significant but positive effect is the labor force participation rate of females. In destination countries, share of foreign migrant workers is more than half in the total labor force, like in Oman, share of foreign migrant workers is 73%, in Kuwait 83%, in UAE 89%, and in Qatar the share is 94% [ILO, (2006–2015)].[3] Hence, it was hypothesized that any increase in female labor force participation rate and low unemployment rate will further attract the female migrant flow.

Among the demographic factors, lag of fertility rate shows significant and positive impact. One percent increase in fertility rate increases the migrant flow heavily by 311%. The positive impact implies that with increase in the fertility rate at destination, the demand for housemaid's increases further attracts female migrants. Another demographic factor current population was also included in the regression framework, but in the presence of fertility rate, it was omitted from the estimated model. Among the non-economic factors, distance shows negative and significant impact.

Moving towards push factors, the real GDP per capita of Bangladesh affects migration decision negatively, i.e., developed the state the lesser will be the outflow of labor. Developing countries have always faced the problem of excess labor, unemployment, limited resources, low level of education, lack of good governance, etc., all these pushing labor force (either male or female) towards developed countries where they enjoy all the economic benefits. The same is true for Bangladesh, where poverty and unemployment are major obstacles in the way of economic development. Negative sign of real GDP supporting hypothesis lowers the economic development, and thus, the higher will be the migration rate. One percent decline in the GDP increases migrant ratio by 53%.

Moving to the labor market conditions in the origin country, the results show that the impact of employment to population ratio is insignificant while the impact of female labor force participation rate influences the female migrant flow negatively and significantly. This shows that any increase in the female labor force participation rate within the origin country reduces the migrants flow as females always prefer to live near their families.

Further, coefficient of agriculture, manufacturing, and service sectors exerts significant positive impact on flow of female migration contrary to the assumption that higher the size of these sectors the lower will be the migration rate. A possible explanation may be that agriculture and industry generates half of the GDP of Bangladesh. During 2005 to 2009, growth rate in agriculture sector was due to growth in the subsectors like livestock, fisheries, and forestry but the growth has gradually declined during 2009 to 2013 from 5.24 to 2.17. Its lower growth has foster unskilled labor to move from agriculture sector and enters in the labor market of urban areas. This has

gradually increased the pressure on manufacturing and service sectors. The manufacturing sector remained the highest exporting sector due to ready-made garments and textile manufacturing, but the import of capital machinery to improve the productivity of these two sub-sectors declined the employment opportunity of females in these sectors by time as well. The unskilled females from these sectors are now seeking employment either in service sector or moving abroad. Among the demographic factors, fertility rate found to be influencing the migration decision and the effect of which is negative. Any increase in population will decrease the migration rate because of the increase in the number of dependent at home. One percent increase in fertility rate will decrease the migration around 8.5%.

6 Conclusions

Globalization has raised the economic opportunities for both males and females internationally. Overall estimated migrants in the world are 232 millions, around 3.2% of the world population. About half in million represents women. The growing demand of low-skilled labor in developed countries provides working opportunities for the unskilled labor of developing countries especially for female workers. Asian countries are major supplier of paid domestic workers and care workers to the rest of the world, where Bangladesh is not exceptional. The present study reveals that the past decision of female migrations provides support to pres females who decide to go abroad. The effect of pull and push factors differs as theory predicts. The effect remains mostly according to the theory. The present study proposes that as lack of education creates obstacles for females to enter labor markets, the enhancement of training and skill programs before migration can be fruitful for the success. There is also a need to promote equal and nongender bias employment opportunities for female workers in developing countries. Moral and ethical support of civil society with collaboration of NGOs can facilitate female migrants' workers.

In log of real GDP per capita of Bangladesh, an indicator of development of origin country shows significant but negative effect confirming the theory that low development of country pushes workers to migrate. In contrast, economic development in the destination country attracts the workforce from the least developed countries by providing economic opportunity and good standards of living. Labor market indicators of Bangladesh such as size of manufacturing, service, and agriculture sectors contribute significantly in motivating the females to migrate. Meanwhile, demographic factors such as high fertility rate of Bangladesh discourage females to migrate by increasing the number of dependent at home while fertility rate of destination country increases the demand for female migrant, mainly to work as domestic workers.

Endnotes

[1]Asian Migrant Centre 1999, Philippines, Sri Lanka, Indonesia, Bangladesh, India, and Pakistan

[2]Organisation for Economic Co-operation and Development (OECD) (promote policies for economic well being for all over the world)

[3]ILO Asian decent work decade (2006–2015), trend and outlook for labour migration in Asia.

Appendix 1

6.1 Variance-covariance matrix

The variance-covariance matrix of the error is

$$E\left[\Delta v_i \Delta v_i^{'}\right] = \sigma_v^2 (I_N \otimes G)$$

Since the instruments are orthogonal to the error by construction, we have the moment condition

$$E\left[W_i^{'} \Delta v_i\right] = 0$$

Pre-multiplying the model in vector form with the matrix of all instruments gives

$$W^{'} \Delta y = W^{'} (\Delta y{-}1)\delta + W^{'} \Delta v$$

Performing GLS on this model, we will get the Arellano and Bond (1991) one-step consistent estimator

$$\hat{\delta}_1 = \left[(\Delta y{-}1)^{'} W \left(W^{'} (I_N \otimes G) W\right)^{-1} W^{'} (\Delta y{-}1)\right]^{-1} \times \left[(\Delta y{-}1)^{'} W \left(W^{'} (I_N \otimes G) W\right)^{-1} W^{'} (\Delta y)\right]$$

The optimal GMM estimator (Hansen 1982) for this model for $N \to \infty$ and T fixed (using only the above moment restriction) is the same formula as above except replacing

$$\left(W^{'} (I_N \otimes G) W\right) \text{ by } V_N = \sum_{i=1}^{N} W_i^{'} (\Delta v_i)(\Delta v_i)^{'} W_i$$

where Δv is obtained from the residuals from the one-step estimation. The two-step Arellano and Bond (1991) estimator is then given by

$$\hat{\delta}_1 = \left[(\Delta y{-}1)^{'} W \left(W^{'} \left(\hat{V}_N\right)^{-1} W^{'} (\Delta y{-}1)\right]^{-1} \times \left[(\Delta y{-}1)^{'} W \left(\hat{V}_N\right)^{-1} W^{'} (\Delta y)\right]$$

If there are additional strictly exogenous regressors X_{it} with $E(X_{it} V_{is}) = 0 \ \forall \ (t, s)$ but X_{it} is correlated with μ_i, then X_{it} is valid instruments for the first-differenced equation. Therefore, $\left[X_{i1}^{'}, X_{i2}^{'}, X_{i3}^{'} \ldots X_{it}^{'}\right]$ should be added to each diagonal element in W_i.

If X_{it} is predetermined rather than strictly exogenous with $E(X_{it} V_{is}) \neq 0$ for $s < t$ and 0 otherwise, then only $\left[X_{i1}^{'}, X_{i2}^{'}, X_{i3}^{'} \ldots X_{s-1}^{'}\right]$ is the valid instruments at period s.

Appendix 2

Table 5 Fixed effects test for Bangladesh

Determinants	Coefficient	*P* value
Pull factor		
Lag-dependent variable: log of female migrant flow	0.58	(0.00)*
Macroeconomic factors		
Log real gross domestic production per capita (ppp)	3.90	(0.01)*
Lag 1 of log real gross domestic product per capita (ppp)[b]	−1.56	(0.34)
Labor market factors		
Log agriculture sector value addition	−0.23	(0.67)
Log manufacturing sector value addition	−1.06	(0.22)
Log service sector value addition	−0.26	(0.79)
Employment to population ratio[a]	0.02	(0.84)
Labor force participation rate female[a]	0.08	(0.54)
Demographic factors		
Log fertility rate	−2.61	(0.10)***
Noneconomic factors	0.01	(0.05)**
Distance	0.39	(0.44)
Religion		
Push factor		
Macroeconomic factors		
Log real gross domestic product per capita (ppp)	−54.24	(0.09)***
Lag 2 of log real gross domestic product per capita (ppp)[b]	12.58	(0.39)
Labor market factors		
Agriculture sector value addition[a]	−2.75	(0.15)
Log manufacturing sector addition	−1.82	(0.65)
Log service sector value addition	−1.71	(0.53)
Log employment to population ratio	54.59	(0.17)
Lag 1 of labor force participation rate female[b]	−5.96	(0.34)
Demographic factors		
Log fertility rate	−33.21	(0.71)
Constant	406.01	(0.48)
Number of observation	207	
F test	25.45	
Probability > *F*	0.00	
Adjusted R^2	0.81	
With countries dummies included	Yes	

Note: *, **, and *** represent significance at 1, 5, and 10% significant level
[a]Log Values of some of the variables shows insignificant impact hence not included
[b]Lag values are used to control endogeneity

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