Maximizing the Development Impacts of Remittances in Bangladesh: A Gender Perspective

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Abstract

Remittances have been contributing to the economic development of rural Bangladesh as thousands of poor unskilled workers are remitting money from abroad over the years. Recent migration of female workers to the Middle East countries has added a new dimension in this area since the female migrant workers are vulnerable to wage discrimination and unfavorable working environment in those countries. This study examines the relationship between remittances and economic growth in Bangladesh over a horizon of 40 years (1976-2015), and analyzes the female worker's migration data from 1991 to 2016 to see whether any wage disparity exists between male and female workers in the four Middle East countries: United Arab Emirates (UAE), Kingdom of Saudi Arabia (KSA), Lebanon, Jordan. The study finds that remittance inflow has positive impacts on economic growth of Bangladesh in the long-run while in the short run remittance does not cause Gross Domestic Product (GDP) rather GDP causes remittances. The study did not find any wage disparity between male and female migrant workers across all four countries. Among country specific results, female migrant workers in KSA seem to be in relatively better position followed by UAE, and then Jordan. Female migrant workers in Lebanon seem to get the lowest pay among the four countries. The study reveals that female workers remit more money than their male counterpart does across all four countries.
Keywords: Remittances, economic growth, female migrant workers, wage disparity.

1. Introduction

Remittances, which have become increasingly a prominent source of external finances in many developing countries including Bangladesh, act as a significant macroeconomic stabilizer in the economy as the flow of remittances is more stable than other external sources, such as official development assistance (ODA) and foreign direct investment (FDI). It is also counter cyclical as the flow increases during economic downturns since migrant workers want to provide more financial support to their family members during that time (Sayan, 2006). Bangladesh received 15.3 billion US$ (7.9 per cent of GDP) as remittances in 2015 compared to 3.38 billion US$ FDI and 2.57 billion US$ ODA in the same year. The true size of remittances may be much higher- perhaps 50 per cent or more than officially recorded figure because of many informal channels and unrecorded transactions (Ratha , 2006).

Remittances play an important role in the economic development of the developing countries through formation of human capital by contributing across a number of areas such as health, education, poverty reduction and increasing foreign exchange reserve. Ratha (2007) points out that remittances have reduced poverty headcount ratio significantly in Bangladesh (6 per cent head count ratio over the past decade. He (2013) also finds that remittances lower school dropout rates and increase average birth weights for children born in remittance receiving families in developing countries. With the inflows of remittances, Bangladesh's foreign exchange reserved increased by 10.4 times to 33.4 billion US$ at the end of fiscal year[1] 2016-17 from 2.9 billion US$ in fiscal year 2004-05 (Bangladesh Bank).

Although remittances have been contributing to the economic development, there remains debate regarding migration of high skilled workers, expenditure pattern of remittances and high family/social costs involved with the female workers migration. For instance, when a high skilled worker leaves the country (i) other workers might lose the opportunity for training and mutually beneficial exchanges of ideas (ii) society loses its return on high skilled workers trained at public expense (iii) the price of technical services may rise where the potential for substitution of low skill workers is limited (Ratha, 2006). A number of studies have found that only a small portion of remittances is directed towards productive investment as remittances are principally used for immediate consumption of both necessary (house construction or improvement, purchase of land and debt repayment) and discretionary items (such as import of luxury products).

Migration of female workers is even more sensitive as they are susceptible to exploitation in terms of standard working conditions or availing standard pay or involves higher family/social cost as most of the female workers from Bangladesh are unskilled domestic workers who look after their children at home. If a female migrant worker gets lower pay than her male counterpart does even though her family/social cost is higher, it is

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[1] Fiscal year in Bangladesh starts from July

not justified for her to look for job in abroad. ILO (2013) observes that working conditions for low skilled job, such as house domestic workers, are often characterized by very low wages, excessively long hours, absence of a weekly rest day, risks of physical, mental and sexual abuse and restrictions on freedom of movement. Battistella and Conaco (1996) find that children of migrant parents (particularly mother) from Luzon, Philippines perform worse in school and tented to be less socially adjusted than children with both parents at home.

Although women comprise 49.2 per cent of international migrants (UNCTAD, 2013), Bangladeshi female workers started going abroad only since 1991 as there were ban on women migration for the lower level jobs until 2001(Islam, 2013). However, migration of female workers from Bangladesh has increased significantly in the recent years after withdrawal of the ban (Until 2016, 574,075 Bangladeshi women migrated for overseas employment, contributed to increase the women share, at 18.66 per cent, from barely 1 per cent in 1991 (Figure 7)). With the rising share of female workers in overseas employment, 'wage disparity' issue deserves attention against common perception that female workers are paid less than their male counterpart is and are subject to exploitation.

A number of empirical studies have looked into the impacts of remittances on economic growth and development in Bangladesh. The existing literatures shall provide valuable insights to understand how to maximize the development impact of remittances in Bangladesh by focusing on female migrant worker's wage disparity issue.

Literature review

Numerous studies are being conducted on remittances due to its' growing influence on many developing countries. At global level, Barjas et al. (2009) examine channels through which remittances can influence economic growth within a growth accounting framework i.e. capital accumulation, labor force growth, and total factor productivity. By using panel data of annual remittances of 84 recipient countries from 1970 to 2004, he did not find positive impacts of remittances on economic growth.

In Bangladesh, some studies have found remittances inflow has negative impacts on economic growth. Siddique et al. (2012) have investigated the causal link between remittances and economic growth in three countries: Bangladesh, India and Sri Lanka by employing Granger Causality test under a VAR framework where 25-years' time series data were used. He finds that growth in remittances does not cause economic growth in Bangladesh. By using time series data of 1995-2006 and employing Johansen Cointegration test, Ahmed (2010) demonstrates that remittance inflows to Bangladesh have significant negative impact on economic growth of Bangladesh.

In contrast, some other studies find that remittances have positive impacts on economic growth and development in Bangladesh. Hassan et al. (2012) have examined the impacts of inward remittances flows on per capita GDP growth in Bangladesh for the period 1974-2006 and find that the growth effects of remittances is negative at first but becomes positive at a later stage because of unproductive use of remittances in the beginning followed by more productive use later. By using annual time series data from 1976 to 2012 and employing ARDL model, Datta and Sarkar (2014) find weak long run relationship between the remittances and economic growth in Bangladesh. Alam (2012) by using multivariate Cointegration approach find that remittances have stronger impact on human capital than investment. He suggests that remittances contribute to sustainable economic growth through formation of human capital.

Siddiqui (2004) looks into the efficiency of migrant workers' remittances by analyzing migrants' remittance management, which is an important source of finance for development as the volume is higher than even foreign aid to Bangladesh. She finds that sector level growth from agriculture to services has direct correlation with migrant's remittances but the information regarding investment opportunities is not easily accessible to migrant workers, which is a big hurdle for them to make any investment decision. She suggests that remittances can be better utilized if government creates opportunity for migrant families to invest in small and medium enterprises.

Islam (2013) analyzes the composition of female migrant workers and their income level. He finds that most of the female workers are involved with low skilled jobs, such as housekeeping and cleaning, and the average wage of Bangladeshi female workers ranges from US$100 to US$200. Other professions are garments workers, nurses and other professional workers whose wages are as good as the male workers. He finds that female migrants lack professional skills and necessary information about migration process, which makes them vulnerable to cheating by some unscrupulous agencies. He points out that awareness campaign and information dissemination are two major tools for ensuring safe migration of female workers.

Another exploratory research by Das (2012) looked at female migrant workers' remittances and its' contribution to the national economy by using interviews and focus group discussions among 102 respondents. He finds that women remit on average 72 per cent of their income against men who remit 45-50 per cent share of their income to the country. Remittance inflow contributed to change economic hardship of 62 per cent of families and 38 per cent of families are in the process of overcoming their economic hardship. He also finds that majority of female migrants use bank for remitting money to their families, which helps national economy.

Islam and Dhungana (2013) looked into Bangladeshi female migrant workers' saving and remitting pattern,

and afterwards their role in the society. By conducting a survey among 401 respondents including female workers in Lebanon, left behind families, key actors and stakeholders, they find that 61 per cent of women send money back home within three months, which constitutes up to 83 per cent of a woman's monthly salary. The study also finds that 52 per cent of the remitted money contributes to increase food intakes of the family and 30 per cent utilizes for children's education and health. The other interesting finding of the study is that 57 per cent of the returnee women think that their role in the family has appreciated and respected whereas 63 per cent of the women think that they can influence family decision.

Most of the previous studies looked for relationship between remittances and economic growth, and some exploratory researches have been done thus far. Exploratory researches that are conducted in relation to female worker's remittances are limited to conducting survey and focus group discussions on female migrant workers who has returned to Bangladesh. The previous studies did not look for wage disparity between female and male workers against the hypothesis that female workers are paid less than that of their male counterpart. This study attempts to fill the gap by analyzing the female workers' overseas employment and remittances inflow data to Bangladesh over the last 26 years (1991-2016).

The objective of the study is to maximize the development impacts of remittances in Bangladesh by focusing on whether any wage disparity exists between female and male migrant workers as female share has risen exponentially over the last decade (Figure 7). With the rising share, female workers can contribute more to their families and communities if they do not face any discrimination in terms of wages or working conditions. This study contributes to the existing literature in three ways. Firstly, the study rechecks the relationship between remittances and economic growth over a long horizon of 40 years (1976-2015). Secondly, the study analyzes wage disparity between male and female migrants in four Middle East countries: United Arab Emirates (UAE), Kingdom of Saudi Arabia (KSA), Lebanon, Jordan as these countries simultaneously absorbed 79.54 per cent of female migrant workers from Bangladesh over the last 26 years. Thirdly, the study might provide policy inputs to the government of Bangladesh in a period of declining foreign aid and a rising share of female workers joining in the overseas employment.

The key findings of the study are remittances inflow has long-term positive impacts on economic growth of Bangladesh. In the short run, remittances does not cause GDP, rather GDP causes remittances. The study did not find any wage disparity between male and female workers but female workers remit more money than their male counterpart does across all four countries (KSA, UAE, Lebanon, and Jordon). Among the four countries, female workers in KSA seem to be in comparatively better position followed by UAE and then Jordan. Female migrants in Lebanon seem to get the lowest pay among four countries.

The remainder of the paper is constructed as follows: Section 2 gives a preview of Bangladesh Remittances Scenario, Section 3 describes about Methodology, Model, and Data, Section 4 describes Data Processing & Results and Section 5 gives Conclusions and Policy implications based on empirical results.

2. Bangladesh Remittances Scenario

Bangladesh has a long history of migration and overseas remittances since 1942. Bangladeshi workers started migrating to the port cities of London and Liverpool in the UK during the British rule in Indian subcontinent (Mahmood, 1991). Migration of Bangladeshi workers continued in the UK due to increasing demand of cheap labour there, although it was small. After national independence in 1971 and subsequent oil boom in 1973 has led to an increasing demand for cheap labor in the Middle East, which eventually led to a rapid growth of international labor migration from Bangladesh (Etzold & Mallick, 2015). After 1990s and onwards, Bangladeshi workers tried to find job opportunity in the developed countries such as USA, Canada, and Italy and in some Asian countries such as Malaysia, Singapore and Japan. Official record of Bangladeshi worker started since 1976. During the period 1976 to 2016, migration of labor totaled 10.46 million with yearly migration 6,087 in 1976 to 757,731 in 2016 (Figure 1). This evolution of outward migration makes Bangladesh one of the top remittances recipient countries in the world.
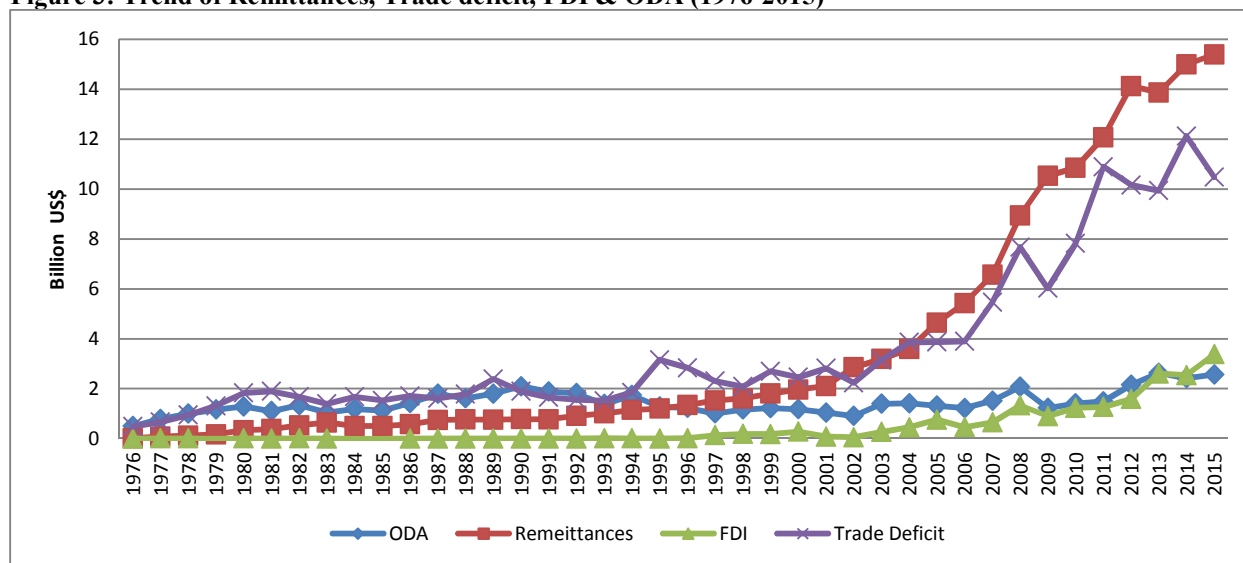
Figure 1: Year wise overseas employment 1976-2016
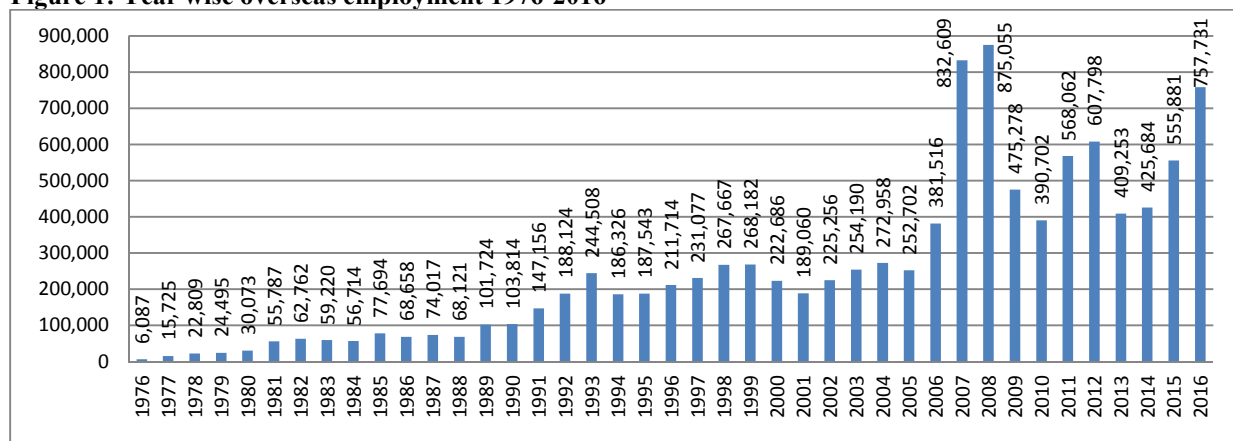
Source: Bureau of Manpower, Employment and Training (BMET), Bangladesh

Figure 2: Yearly remittances received 1976-2015

$$y = 1E+08e^{0.1281x}$$
$$R^2 = 0.9281$$
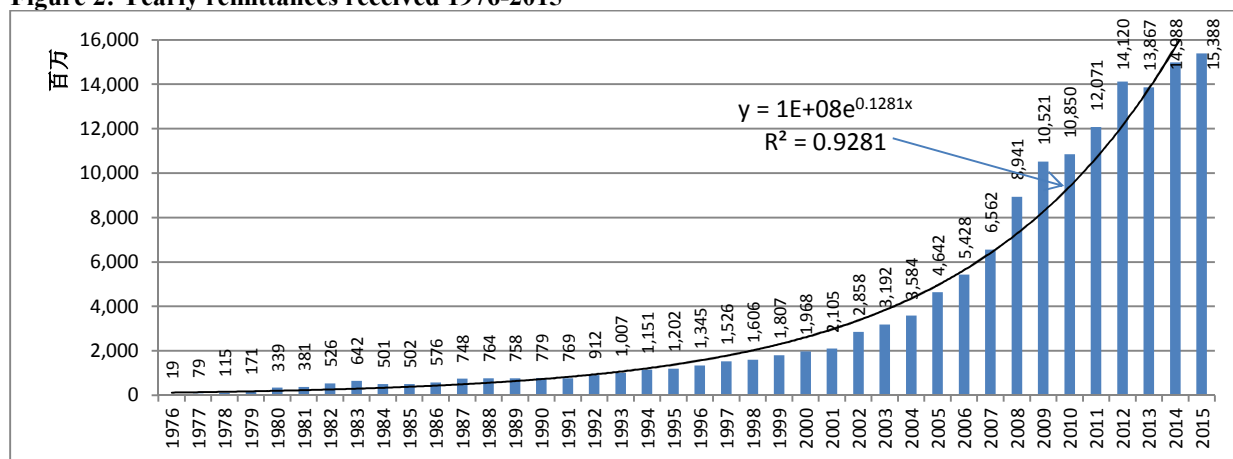
Source: Bureau of Manpower, Employment and Training (BMET), Bangladesh

Figure 3: Trend of Remittances, Trade deficit, FDI & ODA (1976-2015)


Source: World Bank

Figure 2 & Figure 3 illustrate that the flow of remittances increased exponentially over the span of 40 years except few incidents of minor declines. It is evident from figure 2 that after 2004 remittances increases tremendously (329%) from 3.58 billion US$ in 2004 to 15.4 billion US$ in 2015. It is also evident that foreign

remittances outpaced FDI from the very beginning, ODA in 1996, and trade deficit in 2005. This implies that remittance has been in the leading position among all inflows over the last decade and it is compensating the trade deficit and thus makes current account surplus.

**Composition of remittance flow by countries**

Popular destination of Bangladeshi migrant workers is Middle East countries such as KSA, UAE, Kuwait, Oman, Bahrain and other Arab countries. Apart from Middle East countries, Bangladeshi workers usually go to developed countries such as USA, Canada, EU countries, Australia etc. From figure 4, it seems that the gap between Middle East countries and rest of the world (ROW) in terms of remittance inflow is decreasing as the share of remittances from ROW is increasing since 2009-10. On an average 62 per cent of remittances came from Middle East countries in the last 7 years.

Figure 4: Share of remittances inflow: Middle East countries vs. the Rest of world (ROW)
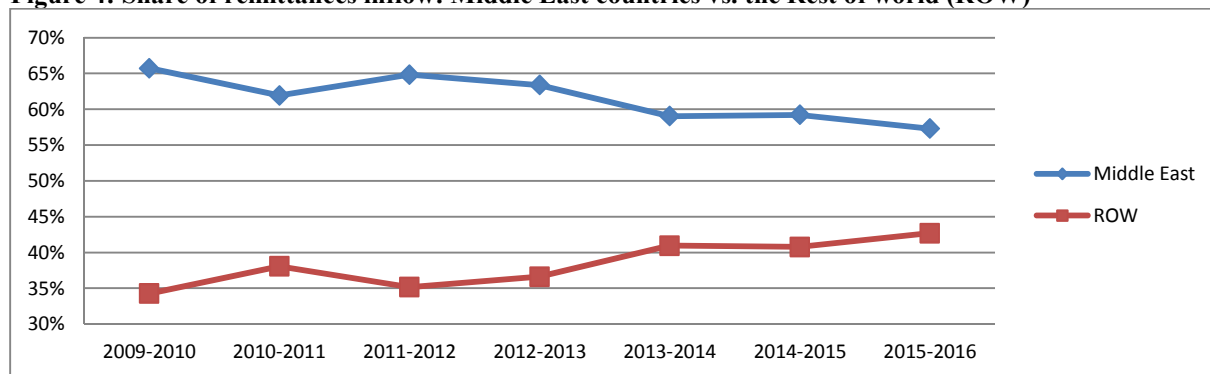
Source: Bangladesh Bank

Figure 5: Share of remittances by Middle East countries & Rest of the world (ROW) in 2015-2016
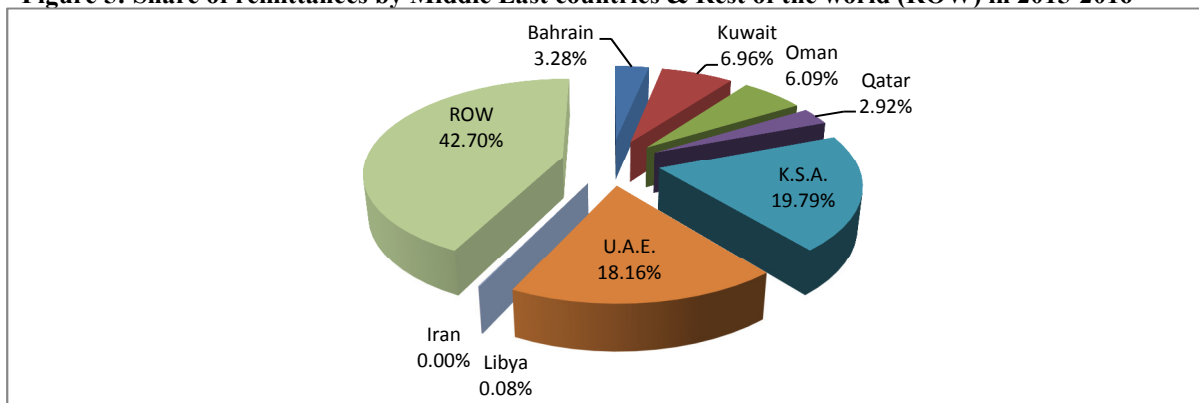

Source: Bureau of Manpower, Employment and Training(BMET), Bangladesh

Among the Middle East countries, KSA and UAE are the countries from where the largest remittance inflows to Bangladesh as these two countries are jointly responsible for 37.95 per cent remittances inflow to Bangladesh.

Skill Category

According to Islam (2011), Bangladeshi temporary migrant population is classified into four categories. These are professional, skilled, semi-skilled, and unskilled. Doctors, engineers, nurses and teachers are considered as professionals. Manufacturing or garments workers are considered as skilled; while tailor, mason, etc. are considered as semi-skilled; and housemaid, cleaner, laborers are classified as less-skilled worker. Professional and skilled workers are supposed to get higher salary and remit more money back to Bangladesh.

Figure 6: Skill patterns of Bangladeshi Migrant workers in the five-year interval

Skill pattern of migrant workers in 1976

Skill pattern of migrant workers in 2016
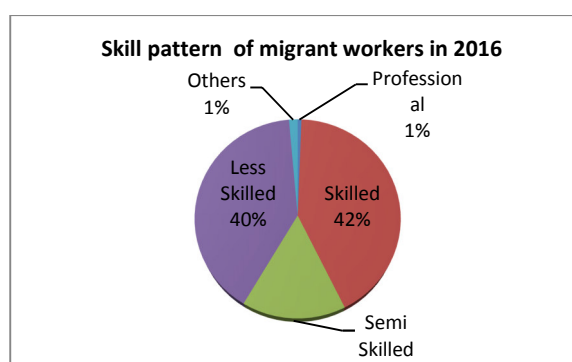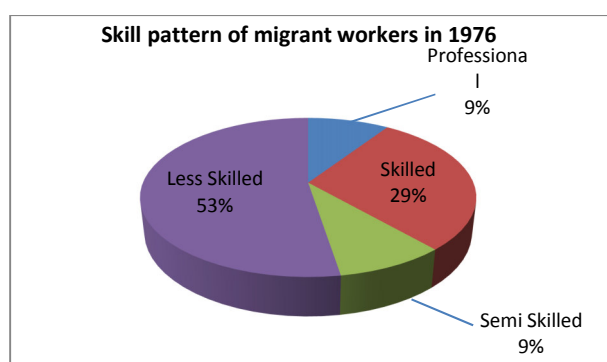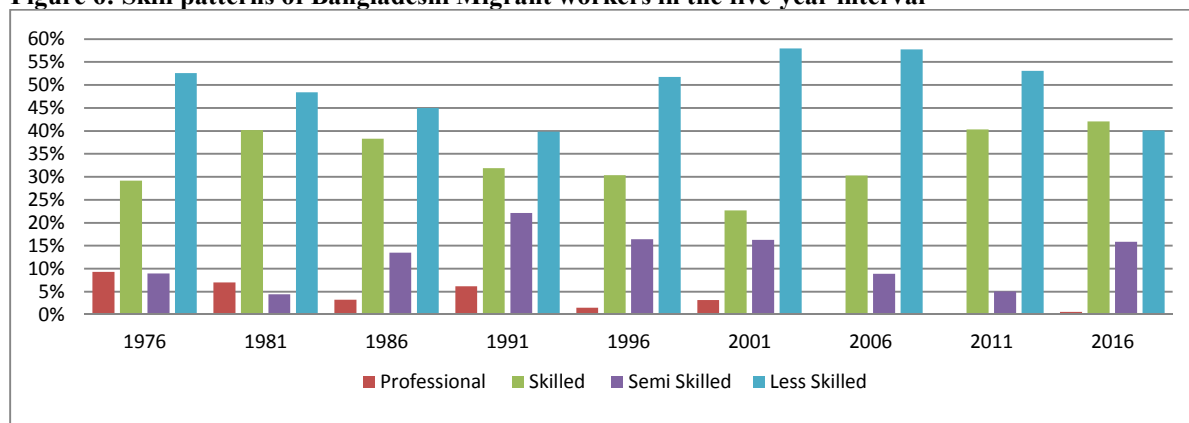
Unfortunately, Bangladesh's progress in terms of sending higher share of skilled workers to overseas is insignificant. In 1976, less skilled workers constitute 53 per cent of total migration and professional was 9 per cent, while in 2016, less skilled workers dropped to 40 per cent, professional workers did not increase either, rather it declined to 1 per cent although total migration has increased exponentially over the period of last 40 years (Figure 6).

Female Migration

Women, being almost half of the population, have equal potential to contribute towards the economic development of the country. Migration of female workers from Bangladesh, which constituted only 1 per cent up to the year 2004, reached about 5% in the subsequent years. However, it dropped again in 2007 and 2008 due to the global recession, then again it takes off and reached 18.66 per cent in 2015. Although international migration from Bangladesh started officially since 1976, female migration was recorded only from 1991. In fact, there were several bans on women migration from Bangladesh on lower level jobs up to 2001. After withdrawal of major bans on female migration in lower level jobs, it grew exponentially after 2004. Up to 2016, 574,075 female workers migrated for overseas employment in 18 countries. Female share reached maximum 18.66 per cent in 2015 (Figure 7). Although international migration of female workers is about 49 per cent, Bangladeshi female workers entered the overseas labour market lately and still cover a low percentage of overall migration whereas the figure is about 70-90% in case of the Philippine and Sri Lanka (Islam 2013).

Figure 7: Flow of female share of migrant workers from Bangladesh (1991-2016)
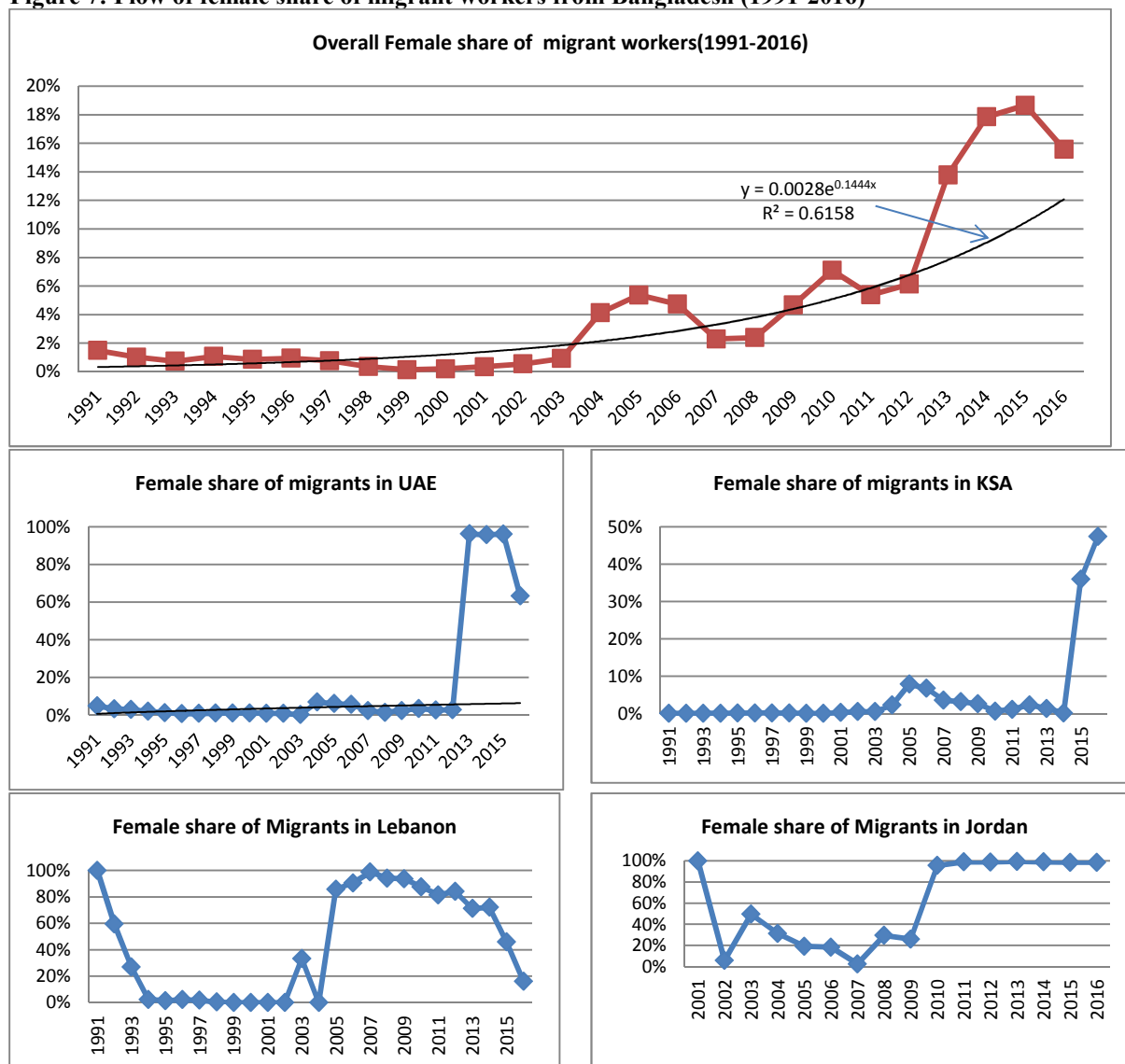
Data Source: Bureau of Manpower, Employment and Training (BMET), Bangladesh

Overall, female migration, which was only about 1 per cent before 2004, started to rise after 2004. Lebanon started to pull Bangladeshi female migrants after 2004 and in 2007 female share reached 100 per cent although it is declining. Then female migrants share started to increase in Jordan from the year 2010 (reached almost 100 per cent) until 2016. Although KSA and UAE are the two largest employer of Bangladeshi migrant workers, female share has been insignificant until 2012 in UAE, and until 2014 in KSA.

3. Methodology, Model & Data

To examine the development impacts of remittances, the study firstly checks impacts of remittances on GDP over 40 years time horizon from 1976 to 2015. For this purpose, annual GDP and remittances data are used to check the relationship. The presence of unit root in the data is checked by using Augmented Dickey Fuller (ADF) test. Then Engle Granger 2-step co-integration test (ADF unit root test on the residual series obtained from regression of GDP on remittances) is used to check whether long run relationship exists between them as time series variables sometimes produce spurious regression due to unit root (Granger & Newbold 1974). Later on Vector Error correction Model (VECM) is estimated to explain the long run and short run relationship among the variables. VEC Granger Causality Test is used to check the short run relationship between remittances and GDP.

Growth Model: $LGDP_t = \alpha_0 + \alpha_1 LREM_t + e_t$

Where $LGDP_t$ stands for logarithm of remittance inflow to Bangladesh during the year t, LGDP stands for logarithm of annual GDP of Bangladesh in the year t. All data are used in logarithm form so that α_1 can be explained as elasticity of GDP growth with respect to remittance growth.

Stock of migrants is calculated by assuming 25 per cent[1] of total migrants' contracts get renewal every year.

Model for Migration stock: $MS_t = \Delta * MS_{t-1} + MF_t$

Where MS_t stands for migration stock at the end of year t, $\Delta = .25$ as roughly 25 per cent of the contracts get renewed every year. MF_t stands for migration flow during the year t.

Wage disparity Model

To analyze wage disparity between female and male workers, top four female migrant recipient countries such as KSA, UAE, Lebanon, Jordan are selected (these countries accounted for 79.54 per cent of total female migrants (574,054) from Bangladesh over the last 26 years).

Model for wage disparity: **KSA:** $RPW_{BD} = \beta_0 + \beta_1 FS_{SA} + e$

UAE: $RPW_{BD} = \gamma_0 + \gamma_1 FS_{AE} + e$

Lebanon: $RPW_{BD} = \delta_0 + \delta_1 FS_{LB} + e$

Jordan: $RPW_{BD} = \lambda_0 + \lambda_1 FS_{JO} + e$

Where RPW_{BD} stands for remittances sent per worker per year, FS_{SA} stands for female share of Bangladeshi migrant workers in KSA, FS_{AE} stands for female share of Bangladeshi migrant workers in UAE, FS_{LB} stands for female share of Bangladeshi migrant workers in Lebanon, FS_{JO} stands for female share of Bangladeshi migrant workers in Jordan.

Ordinary Least Square (OLS) regression is used between remittances inflow per worker to Bangladesh and female share of each selected country. The hypothesis is that if the female workers get lesser wage than that of male workers, they will remit lesser money than their male counterpart will, then coefficient of female share will get negative sign.

Due to unavailability of gender segregated data of remittances and insufficient information about wages, overall remittances inflow per worker that is calculated from migration stock, is used as a proxy for overall migrants' wage. The underlying assumption is that both male and female workers have similar saving pattern and they remit similar percentage share of their wages to Bangladesh.

Data sources

The study uses annual data of GDP, remittances for the last 40 years (1976 to 2015) from the World Bank database. Country wise female migration data of the last 26 years (1991-2016) are collected from Bureau of Manpower, Employment and Training (BMET), Bangladesh. The rest of the data are collected from Bangladesh Bank and Ministry of Finance, Bangladesh.

4. Data Processing & Results

Unit root test

The stationarity of the time series data are checked through the Augmented Dickey Fuller (ADF) test based on Dickey and Fuller (1981). The simplest approach of the Dickey Fuller test for a unit root begins with AR (1) process where $y_t = \beta_0 + \rho y_{t-1} + \varepsilon_t$ where $\rho = 1$ means that stochastic variable y_t has a unit root, ε_t is normally distributed white noise term. This test is valid only if ε_t is normally distributed. If there is serial correlation in the Dickey Fuller test equation i.e. the true model is not AR(1), then the test equation should be augmented by adding more lags i.e. we should use AR(p) to get rid of serial correlation . The ADF test uses an AR (p) process expressed in first difference of the variables for testing unit root:

$\Delta y_t = \beta_0 + \beta_1 t + \gamma y_{t-1} + \sum_{t=0}^{p} \delta_p \Delta y_{t-p} + \varepsilon_t$,

where $\Delta y_t = y_t - y_{t-1}$, β_0 is the intercept, t denotes a linear time trend (deterministic), The lag length p is chosen to avoid serial correlation in the error term. Specification of lag length is important issue in ADF test because if p is too small, then the remaining serial correlation in error will bias the test but if p is too large then the power of the test will supper. Schwarz Information criterion (SIC) proposed by Schwarz (1978) has been used to choose the lag length in the test. The null hypothesis is that the series has a unit root i.e. $H_0: \gamma = 0$ is tested against the alternative hypothesis $H_1: \gamma < 0$.

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[1] This information was collected from Mr. M. Mamun Or Rashid, System Analyst, IT division, Bureau of Manpower, Employment and Training (BMET)

Table 1: Unit root test results

Variables	Variables at level				Variables at first difference			
	Exogenous Variable	ADF Test statistic	CriticalValue @ 5% level	Integrated Order	Exogenous Variable	ADF Test statistic	Critical Value @ 5% level	Integrated Order
LREM	Const. & trend	-7.49	-3.53	I(0)	Const.	-8.44	-2.94	I(0)
LGDP	"	-1.75	-3.53	I(1)	Const.	-5.46	-2.94	I(0)

* Exogenous variables are chosen based on the P-value of the ADF test

From table 1, it is evident that LREM is I(0), but LGDP is I(1). After first difference both variables converted to I(0).

Engle Granger Cointegration test

Engle and Granger (1987) point out that if two or more non-stationary variables are integrated of the same order, there might be a linear combination among the variables that is stationary. The stationary linear combination is called co-integrating equation and can be used to interpret the long run relationship among the variables.

Firstly, OLS regression is estimated: $LGDP_t = \alpha_0 + \alpha_1 LREM_t + e_t$

Then a residual series is generated from the above equation as: $\hat{e}_t = LGDP_t - \hat{\alpha}_0 - \hat{\alpha}_1 LREM_t$

ADF unit root test is conducted on the residual series $\hat{e}_t$

The null hypothesis is that the residual series $\hat{e}_t$ has a unit root i.e. $H_0: \hat{e}_t \sim I(1)$(=No Cointegration) vs. alternate hypothesis, $H_1: \hat{e}_t \sim I(0)$ (=Cointegration)

From the unit root test, we get ADF test statistics=4.52> critical value (=3.67) (Based on MacKinnon (1991))

As $\hat{e}_t$ has no unit root, there is long run relationship between GDP and Remittances.

Vector Error Correction Model (VECM)

A VECM is a restricted version of VAR model designed for use with non-stationary series that are known to be cointegrated. As Engle Granger test indicates that GDP and remittances are co integrated i.e. long run relationship exists between GDP and remittances, the following error correction model were estimated to interpret the long run and short run results.

Estimated VECM

D(LGDP) = C(1)*(LGDP(-1) - 0.625101116565*LREM(-1) - 11.2161674273) + C(2)*D(LGDP(-1)) + C(3) *D(LGDP(-2)) + C(4)*D(LREM(-1)) + C(5)*D(LREM(-2)) + C(6)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	**-0.115906**	0.062636	-1.850464	0.0738
C(2)	0.348408	0.161887	2.152168	0.0393
C(3)	-0.056001	0.146354	-0.382641	0.7046
C(4)	0.006546	0.076133	0.085987	0.9320
C(5)	0.029293	0.051296	0.571065	0.5721
C(6)	0.043373	0.018768	2.311077	0.0276

Long run estimate

LGDP =   0. 625LREM   +11.21617

Std. Error   (0.05199)

t-Statistic   [-12.0243]

Vector error correction model estimates the coefficient of error correction term C(1) is -0.1159 which is significant at 10 per cent level (corresponding P-value is 0.0738), which means that there is long run relationship between GDP and remittances and any short run deviation from the long run relationship is adjusted by 11.59 per cent per year. The result is consistent with Datta & Sarkar (2014) and Alam (2012).

In the long run, GDP can be can be explained by remittance inflows to Bangladesh. For 1 per cent increase in remittances, GDP increases by .62 per cent. It shows the importance of remittances to Bangladesh economy. Investment of remittances in health and education helps building human capital, which is essential for long term growth of the economy. Moreover, Bangladesh has been suffering from trade deficit from the very beginning of independence (Figure 3). With persistent trade deficit, the country would not be able to pay its huge imports bills. With inability to pay imports bills, the credit rating of the country would have gone down and the country has to borrow money at higher interest rate. Remittances, the second largest source of external finance after exports, work as a macro stabilizer to the economy, which is important for growth sustainability.

Remittance inflow to Bangladesh can effect GDP growth through either consumption channel or investment channel. Most of the literatures find that remittances are primarily used for consumption purposes but a little portion goes for investment. Whatever purposes it is used, consumption purposes or investment purposes, in both

cases remittance can augment aggregate demand of the economy. Remitted money that are used for building human capital (i.e. education and health), housing and land purchase, generates long-term benefit for the recipient family and contribute to long-term growth of the economy.

Although migration has many negative side effects such as labour shortage, loss of skilled workers who could serve in technical services, family/social cost of the migrant workers, in Bangladesh's case, it seems positive impacts of remittances outweigh the negative impacts as Bangladesh is a labour surplus country and most of the workers are less skilled. In fact, migration of less skilled laborers reduces unemployment and underemployment of the country and reduces social conflict arises due to poverty.

Short run relationship

VEC Granger Causality test is used to see whether GDP can be explained by remittances in the short run by putting restriction on the coefficient of D(LREM) or whether remittances can be explained by the GDP in the short run by putting restriction on the coefficient of D(LGDP) in the VEC Model.

VEC Granger Causality Tests results:

Dependent variable: D(LGDP)

Excluded	Chi-sq	df	Prob.
D(LREM)	0.468158	2	**0.7913**

Dependent variable: D(LREM)

Excluded	Chi-sq	df	Prob.
D(LGDP)	7.629046	2	**0.0220**

When the coefficient of D(LREM) is set to zero, corresponding P value = 0.7913. It means that null hypothesis cannot be rejected at 5 per cent level, which means that remittances cannot explain GDP in the short run. This might be because of time lag between a migrant worker leaving his country and settlement for work in the overseas and then remitting money to home. Moreover, most of the migrant workers borrow money before going abroad, therefore migrant workers firstly pay back their money to the lenders, and then they use money for consumption or investment (Islam 2011). Therefore, in the short run remittances cannot explain GDP.

When the coefficient of D(LGDP) is set to zero, corresponding P value = 0.0220. It means that the null hypothesis can be rejected at 5 per cent level, which means that GDP can explain remittances in the short run. This short run relationship can be explained by enabling economic environment of the country or any convenient policy measure taken by the government. When the economic condition of the country is favorable, migrant workers might opt to remit more money back home and looking for any productive investment. Thus, in the short run, GDP growth can pull more remittances from overseas.

Estimated Wage Disparity Model:

UAE:	RPW_{BD}	$= 8786.190$	$+17856.7 FS_{AE}$
	Std. Error	(1160.327)	(4608.505)
	t-Statistic	[7.572169]	[3.874731]
KSA:	RPW_{BD}	$= 9720.523$	$+23905.88 FS_{SA}$
	Std. Error	(1325.388)	(11597.05)
	t-Statistic	[7.334096]	[2.061376]
Lebanon:	RPW_{BD}	$= 7183.834$	$+7844.754 FS_{LB}$
	Std. Error	(1788.241)	(2962.006)
	t-Statistic	[4.017263]	[2.648460]
Jordan:	RPW_{BD}	$= 8173.701$	$+10557.12 FS_{JO}$
	Std. Error	(2035.032)	(2874.459)
	t-Statistic	[4.016498]	[3.672734]

From the above estimated equations, positive sign of the coefficients of female share indicates that female workers remit more money than their male counterparts and overall remittances inflow per worker increases with the increasing share of female workers in all four countries. As share of female workers rises, overall remittances inflow per worker to Bangladesh increases. Since remittances per worker are used as a proxy to a worker's wage, the estimates indicate that the female workers are not discriminated in terms of wages against their male counterpart. Among four countries, KSA has the highest coefficient for female share followed by UAE, then Jordan and Lebanon has the lowest coefficient. Highest coefficient for KSA means remittances per worker is most sensitive to rising share of female in KSA. It means female workers in KSA get relatively better pay than rest of other countries and therefore, they can remit more money than that of other countries. Similarly, the lowest coefficient for female share in Lebanon indicates that female workers in Lebanon might get the lowest pay compared to the rest of the countries and remit lesser money to home.

Different coefficient across countries also means that the structure of skill level amongst the female migrant

workers varies across countries. Highest coefficient for KSA means that composition of female workers going to KSA has higher share of skilled workers than the rest of the countries. Therefore, female workers in KSA get higher salary and can remit more money.

5. Conclusions and Policy Implications

The results of the study show that there is a long term positive relationship between remittances and GDP in Bangladesh as the positive impacts of remittances outweigh the negative impacts of remittances. If a small portion of remittances is directed to the productive investment, the development value of it is significant as a large number of Bangladeshi migrant workers stay abroad (Stahl & Habib 1989). Remittances can be utilized better if the financial intermediaries are able to channel the savings of remittances recipients to investors. Even if, remittances are primarily destined to serve consumption needs, the expansion of consumption may spur domestic demand. Therefore, if remittance increases, GDP increases in the long run.

The study finds that overall remittance per worker increases with increased share of female workers in all four countries, which indicates that female workers remit higher percentage of their income to home than their male counterpart does in all four countries. It means that female migrant worker's marginal propensity to save is higher than their male counterpart is. This is consistent with UNCTAD's (2013) observation that female workers tend to send a higher proportion of their income regularly and consistently. Since the female workers send higher share of their income to home, facilitating female migrant workers (female share still below 20 per cent despite they are half of the total population) can bring more remittances to the country.

Among the country specific results, female workers in KSA seem to be in better position followed by UAE, Jordan and Lebanon. The reason might be the wage rate in KSA or UAE are better than Jordan or Lebanon. The other reason could be the composition of female workers in KSA or UAE constitutes more professional and skilled workers, who are supposedly get better pay than less skilled workers do. Therefore, government should focus on female labor market in KSA or UAE than Jordan or Lebanon to boost remittances inflow. Government to government level deal can facilitate more female workers in KSA or UAE. Government agencies should be proactive and efficient in managing labour migration such as ensuring wage parity between male and female, ensuring health insurance and appropriate working environment.

Government should facilitate more professional and skilled workers to the foreign countries so that they can bring more foreign currency. Islam (2011) asserts that high skilled female workers can earn three to four times higher than the non-skilled workers can. Therefore, government should introduce skilled enhancing projects, which are running at present at a limited scale, in all districts to produce skilled workers. In the short term, government can take special measures such as mandatory skill enhancing programs for the unskilled workers and language training before they fly for overseas jobs.

The development impacts of the remittances can be improved by creating investment opportunities for migrant workers so that they feel confident to invest their hard-earned money in the economy. Given the private nature of remittances and the fact that their main use is for covering basic needs, it is a key policy challenge for government, development agencies and other stakeholders to find ways to channel remittances towards productive investment. Government should put considerable efforts to overcome migrants' mistrust and identify attractive investment and business opportunities for migrant workers. Several countries have been active in devising mechanisms to promote investment, financial stability, businesses start-ups, and local infrastructure building. For instance, in Ghana and Guatemala, about one third of remittances are used for starting small businesses and house construction. India was the first developing country to issue diaspora bonds, an innovative tool to support macroeconomic stability and development financing by tapping into the wealth of a diaspora population, during the economic crisis in 1991, when it experienced a large trade and fiscal deficit, high inflation and devaluation of the Indian rupee (UNCTAD, 2013). Bangladesh can learn lessons from these successful countries to utilize remittances in productive purposes.

Sustainable reintegration of female workers with the society is also essential for maximizing the development impacts of remittances. Female migrant workers, who stay overseas for a limited period, return to the country after completion of the agreement of two to three years (Islam 2013).When they return home, they bring new skills, work experiences and savings. If government helps them with appropriate counseling and creates opportunity for them, they can help women empowerment and thus can contribute to achieve sustainable development of the society.

Although the wage disparity model did not find any wage disparity between female and male workers in this study, with the rising share of female workers in the overseas labour market, especially in the Middle East countries, wage disparity and appropriate working environment are likely to remain a challenging issue for female workers in the future. If the female workers are paid less than their male counterpart despite their high social cost, the overall impacts of remittances diminishes.

While this paper is limited by using overall remittance per worker as proxy for average wage of the migrant workers due to unavailability of gender-segregated remittance data, the use of gender segregated country specific

remittances data could have produced more accurate results. Future study can be conducted subject to the availability of gender segregated remittances data or with wage information.

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Appendices:
Appendix 1: Engle Granger Cointegration test
OLS regression:

Dependent Variable: LGDP
Method: Least Squares
Date: 01/19/17   Time: 23:07
Sample: 1976 2015
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREM	0.491463	0.020126	24.41960	0.0000
C	14.08373	0.425903	33.06L2	0.0000

R-squared	0.940093	Mean dependent var	24.45673
Adjusted R-squared	0.938517	S.D. dependent var	0.787768
S.E. of regression	0.195334	Akaike info criterion	-0.379506
Sum squared resid	1.449903	Schwarz criterion	-0.295062
Log likelihood	9.590114	Hannan-Quinn criter.	-0.348973
F-statistic	596.3169	Durbin-Watson stat	0.632987
Prob(F-statistic)	0.000000		

ADF test on residual series:

Null Hypothesis: ECT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.519325	0.0000
Test critical values:	1% level	-2.625606	
	5% level	-1.949609	
	10% level	-1.611593	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECT)
Method: Least Squares
Date: 01/25/17   Time: 23:14
Sample (adjusted): 1977 2015
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.496435	0.109847	-4.519325	0.0001

R-squared	0.347499	Mean dependent var	-0.008675
Adjusted R-squared	0.347499	S.D. dependent var	0.155160
S.E. of regression	0.125334	Akaike info criterion	-1.290357
Sum squared resid	0.596931	Schwarz criterion	-1.247701
Log likelihood	26.16195	Hannan-Quinn criter.	-1.275052
Durbin-Watson stat	1.059983		

Appendix 2: VAR Lag Order Selection Criteria

Endogenous variables: LGDP LREM
Exogenous variables: C
Date: 01/19/17   Time: 22:51
Sample: 1976 2015
Included observations: 37

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-39.28720	NA	0.031937	2.231741	2.318817	2.262439
1	73.13878	206.6207	9.10e-05	-3.629123	-3.367893*	-3.537028
2	79.21754	10.51460*	8.16e-05	-3.741489	-3.306105	-3.587996*
3	83.59837	7.104056	8.04e-05*	-3.762074*	-3.152538	-3.547184

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion