



The Impact of Remittances on Fertility Rate: Evidence from Pakistan

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Abstract: In this paper we examine the association between workers' remittances and fertility rate of the home country. The author categorize two key paths by which transfer of remittances influence the fertility. First, migrants tend to adopt the notions, cultures and values which are exist in the host country and later transmit to their families. Possibly, those migrants with more close to their families so they will send more money to their home. Consequently, social norms can be taken as a proxy of a remittances (containing preferences of fertility) which is transferred from the migrant to the family. In addition to, earlier literature have indicated that remittances is frequently used for educational expenses and health services. Eventually, these factors make the cause to reduce the fertility rates. In the paper we use time series data of Pakistan for the period of 1975-2015. We use ordinary least square technique of estimation and find a negative association between remittances and fertility rate. Moreover, we find also some evidence about transmit of social norms to recipient country. This study also affirms that numerous socio-economic components namely; average host fertility rate, female literacy rate, percent of population in rural area, GDP per capita and female labour force participation affect fertility rates.

JEL Code Classification: F22, F24, J13, C33

Keywords: International Migration, Remittances, Fertility Rate, Time Series Data.

1.

INTRODUCTION

In modern years the standard of international Diaspora has increased significantly. In 2000 to 2015 the rate of Diaspora has grown 37% in 15 years (Migration and Remittances, Factbook 2015). Further the current number of international migrant would portray one of the most several countries in the world. Due to the rise in the migrant and reduction fees for transmitting money have stimulated the movement of remittance. The current estimates value global remittances flow about US \$601 billion (World Bank 2016).

In often countries the rate of fertility has reduced while grown in the migration rate. In few developed countries fertility rate have reduced to level below those desired to immune generational replacement (Sleeboos, 2003). This reality has motivated various governments in developing nation and aimed to developed policies for fostering childbearing. At the same time, in many developing countries, giant population growth has yet focused to be one of the barriers to economic growth. Even though women in developing world inclined to have lower children than before but the fertility rate continue high when compare to developed countries

Are rates of migration and levels of fertility linked? The earlier studies advises that migration rate and fertility level may have associated to each other.

Actually, there is an ample literature on migrant's fertility rates. Often literatures fall into one of two areas. First, previous literature claim that immigrants reflect preferences of fertility which prevail in the home region. Thus, closer headed for fertility levels of the destination country takes place only in the next generation. In spite of argue some current studies the second generation is still firmly affected by the fertility preferences of the parent's home country (Fernandez and Fogli, 2009). Further studies conclude with the passage of time the fertility trend behavior of the migrant households and host countries comes to identical. Anyhow, we anticipate to examine that migrant families have frequently decrease the level of fertility instantly following migration, because of the interruptive elements linked with migration action (Kulu, 2003).

Whereas there are many studies have considered on the behavior of fertility of the migrants. Those household members that left behind in the destination country, so what will happen to their fertility behavior? (Fargues, 2007) claims that those migrant who live in the host countries, they adopt their ideas of fertility which exists in the host country and later migrant transfer to their home countries. Thus, those countries where flow of migrants have greater extent, so we may

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consider a rate of fertility of the destination and recipient countries converged to each other, but the convergence will may be dissimilar for each developing nations because the choice of migrant may not the same for the host country. Moreover, migrants in few host countries may have a strong association to the origin country as compare to other destinations country. It is anticipated that there is going to be giant flow of social norms from the host country to the home country if there is strong connection prevail between migrants and the home country. Therefore, the quicker convergence rates of fertility between recipient country and host country.

The workers' remittances measure the backbone of the relationship between migrants and the households back home. Rationally, those migrants who excessively closed to their family members of the origin country so they would be more willing to remit money to their home. Consequently, the social remittances can be measured by the monetary remittances. (Levit, 1998) refers social remittances as the thoughts and standard of behavior transfer from destination countries to home.

Thus, the migrants are not only sent money from host to recipient countries but also transfer the behavioral expectations and norms to their home. The monetary sums can be good indexing of social remittances. In addition, it also consider the backbone of the relationship between the migrants and their families. If it the scenario, given that remittances indicate the connection of Diaspora to the families, and that often migration occur from high fertility nations to low one, we must expect an inverse association between the fertility rate of the origin country and workers' remittances.

This notion shows irrespective of the purpose for remitting. There has been plethora argue regarding remittances in which the major motive of migrant to remit money back home. Furthermore, nexus of literature debates that migrants always care about their families due to altruistic in nature. For that, migrants remit money to their families for improving their living standard. Further literatures argue that, there are some other reasons for instance, they remit money for investments in origin country. All these cases of remittances indicates an attachment of the migrants to the recipient country.

In this study, we examine the impact remittances on the fertility rate in Pakistan. Moreover, existence of the association between fertility and migration there are some other factors too, that causes us to think about the connection between the remittances and fertility rate. Initial, most of the recipient families having more

children (particularly rural families) and consider as an investment because they consider them as coming potential remitters. Despite, the earlier studies advises that a significant part of remittances money is spent on health services i.e. contraception and other medicine that may eventually reduce the new born. Moreover, there are plethora literature that backing the idea that remittances can appreciate the education of kids in the family. As argues by (Cleland, 2003) that the education frequently appeared as the leading medium of demographic behavior. Consequently, due to this fact remittances may affect literacy level of the recipient country and finally it affect the fertility rate.

In Pakistan case, the substantial quantity of remittances movement during the past decades it transmit the giant interest among the researchers. A plethora of literature has considered at micro as well as macro level most of the researcher considered remittances impact of growth and development (Amjad, 1986; Kozel and Alderman, 1990; Nishat and Bilgrami, 1991; Burki, 1991; Malik *et al*, 1993; Nishat *et al*, 1993; Adams, 1998; Arif, 1999; Iqbal and Sattar, 2005; Khalid Al, 2012).The comprehensive conclusion of these literature advices that remittances have directly effect on economic growth of Pakistan. Still, there is an absence of literatures considering on the impact of remittances on the fertility rate of home countries. In this paper our aim to fill this gap.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

In this part, we state additional instinct behind the link between the remittances and fertility rate and argue regarding related studies. To elaborate this relationship we construct a model for that we assume FR shows that total fertility rate in the home country, letting WR represent the workers' remittances and assuming Z be a vector of other factors of fertility rate. Therefore, we can make our equation as.

$$FR = f(WR, Z).....(1)$$

Remittances show the association between the family members and migrants. It is social indicator, the higher inflow of remittances', that means there is stronger attachment between migrant and family members as a result the larger the impact of migrants on their family members. This effect incorporates to take decision regarding maximum numbers of kids to have. The plethora of notion between migrants, usually living in that country where fertility level low , so it is anticipated to encourage the fertility of remaining family members converges to the fertility level exist in the destination country.

Moreover, as we discussed earlier that, the transfer of remittances are usually applied for expenses on health

which can incorporate on some medicine like contraceptive pills which may decrease the fertility rate. For example, Adams (2005) taking time series data of Guatemala, discovers that, those members who are remittance receiving families, they spend lots of money on health as compare with other families and the same result also found by Amuedo-Dorantes (2007) and Valero-Gil (2008) in case of Mexico.

In addition to, there are many literatures that support the ideas that inflow of remittances can appreciate the education level of children. Household budget restriction can solve through the inflow of remittances and families have enough money for sending their kids to school. Due to additional income, the demand for child labor may be decrease and remitters have certainly desire regarding their children to attend school. Let consider remittances as a process of intergenerational, so those people who moves to other countries may think to retire in the origin country and their children will helping them financially at an older age. For instance one particular outcome can be found by (Edwards and Ureta, 2003). The data using for EI Salvador, They determine that remittances directly related with school retention. There is the great effect on school retention by remittances as compare to other source of family income. For instance (Lu and Treinman, 2007) they are found same results in their study for blacks in South Africa.

Another point of view, remittances can be looked at a source of unemployed labor. On the contrary, to improve in the wage rate (particularly the wage rate of female) appreciates the opportunity cost of giving up labor and spend time and in leisure activities. Moreover, Demand of children may be increase by remittances. If consider a children as a normal goods so whenever appreciate in income consequently, it will directly increase the children's demand by non-labor income.

To find out the link between remittances and the rate of fertility in the recipient country is main aim of this paper. A few papers have argued about the same notion to ours. For example, (Fargues, 2007) takes a time series data and finds out the inverse relationship between and births in morocco and turkey another hand there are positive correlation in Egypt of remittances.

(Beineet *al*, 2008) analyze the association between rate of fertility and migration. Furthermore, they are concentrating on the effect of living standard from the destination country on receiving country fertility rates. They are successfully to evaluate the indication that the fertility norms also moves along remittances from host to home countries. In their study they consider remittances as an important part of non-labor income.

Furthermore we argue that to measure the link between the migrant and the household so for that purpose remittances are consider as important key. In addition to, the magnitude of remittances is not an important part. In this study we emphasizes on the purpose of remittances in the transferring of notion from migrant to the family.

We must check the group of additional components for in order to be productive in our attempts. In particular, we check for the percentage rural areas of population, the female labor force participation rate, female literacy rate, income per capita and average host fertility rate of the top ten countries¹.he urban areas fertility rate is less than the rural areas which express that there are directly related with the percentage of population living in rural areas and fertility rate (United Nation, 1986). We anticipate that female labor force participation and fertility rate are inversely related because if the female take a part on work force, there will be higher opportunity cost occur so thus, the decrease the rate of fertility (Yamada and Yamada, 1984). While (Docquier, 2004, Jones and Tertilt, 2008), anticipate that, income per capita and fertility rate are inversely related to each other because the higher income per capita generally contributes to lower fertility rates. The share of migration as population's percentage and fertility relation is not totally clear. Generally migrants travel from higher to lower fertility rate nations and its takes time to set the level of fertility of the destination country. Though, the process of moving people one place to other place indicates a disruptive action that temporarily reduces fertility.

3. DATA AND METHODOLOGY

The author used multiple regression analysis to find the long run association between the variables. In this study, author considered on secondary data, all data is taken from various sources such as; World Bank data (WDI), Pakistan economic survey (PES) and Statistical handbook. However, author has taken seven variables namely; home fertility rate, host fertility rate, remittances, income per capita, rural population, Female literacy rate and Female labor force participation.

There are numerous vital problems regarding remittances data especially in developing country like Pakistan. First, migrant send remittances by via Hundi or by hand. Second, if the individual sent income to their household through informal channels so, it will difficult for government officials to trace these share of remittances. So as to lessen these issues we used the data of remittances and a percentage of GDP. Accordingly, fertility rate which estimates by the number of children per woman. Moreover, there are

1 USA, U.K, CANADA, GERMANY, UAE, KSA, OMAN, KUWAIT, BAHRAIN, QATAR

some other crucial factors also incorporated such as; the average fertility rate of top ten those host countries where mostly Pakistani are resident and send remittances to their households, Logarithm of population living in rural areas, female labor force participation rate, female literacy rate and logarithm of income per capita. In this research author used the annual time series data of Pakistan for the period 1975-2015. Consequently, after the selection of above mentioned variable, we can define the fertility rate is the function of Pakistan in the following way.

$$FR = f(REM, AHF, RP, FLP, GPC, FLR)$$

Where FR is the home fertility rate, f indicates the function of REM, AHF, RP, FLP, GPC AND FLR represent respectively, remittances, average host fertility rate, rural population, female labor force participation, GDP per capita and female literacy rate. After addition of error term author describe the fertility rate function in linear form in the following way.

$$FR = \beta_0 + \beta_1 REM + \beta_2 AHF + \beta_3 RP + \beta_4 FLP + \beta_5 GPC + \beta_6 FLR \quad (2)$$

4. RESULT ANALYSIS

This section will be conducted in order to observe the association between fertility rate not only with remittances but also incorporated some other essential factors such as; average host fertility rate, rural population, female labour force participation, GDP per capita and female literacy rate. We will used Multiple Regression analysis to estimate the significant relation between dependent and independent variable. The descriptive statistics of all variables are mentioned below, (Table:1)

Table:1 Descriptive Statistics

Variable	Mean	St.deviation	Minimum	Maximum
FER	5.05	1.36	2.60	6.61
REM	5.15	2.24	1.45	10.25
AHF	3.13	0.92	1.98	4.64
RP	67.99	3.38	61.24	73.60
FLP	15.18	5.17	7.29	24.11
GPC	560.13	333.12	165.59	1316.98
FLR	29.91	11.90	14.00	49.00

And results of multiple regression equation are mentioned in (Table:2)

Table: 2 Result of OLS

Dependent variable:	Home Fertility Rate		
Variable	Coefficient	T-stats	Probability
REM	-0.010	-2.036	0.049b
AHF	0.805	3.119	0.003a
RP	4.661	4.908	0.000a
FLR	-0.032	-5.256	0.000a
GPC	0.229	3.481	0.001a
FLP	-0.128	-1.922	0.063c
R2	0.98		
F-stats (Prob.) 368.291 (0.000)			

Note: a, b, c indicates the 1%, 5% and 10% level of significance respective

This study employs time series data for the period of 1975-2015 annually. This provides us with a 40-year observation on all of the variables included in the model. Equation.2 is estimated by using simple OLS technique. The estimated results are presented in Table:2. The coefficients of the regressions are reported with t-stats and probability. As the table indicates, all the variables have the expected signs. The estimation results are the following.

a) The sign of remittance is negative, that means remittances flows have a negative impact on home fertility, while p-value suggesting that the remittance has a significant impact on fertility of home country. Moreover, as remittances increase so the families in recipient countries spent some portion of remittances on health services such as contraceptive pills as we mentioned in section 2.

b) The average fertility of host countries is significantly positive impact on home fertility rate. We can observe from the history that the migrants move to those countries where fertility rates are lower than home country. Consequently, migrant adopts the norms of host country fertility and later migrant transmits those living standard and values back to the home country, however this is depends on the relationship of the migrant with the family back home. As a result, domestic fertility rates converge to host fertility rate as we expected.

c) The population living in rural areas is positive and highly significant impact on fertility rate as we anticipated. In general most of the studies confirm that the rural fertility rates are higher as compare with urban areas.

d) The female literacy has significant negative affect on fertility. It shows a negative relationship with fertility. As access of formal education of female is increase so the fertility rate tend to decrease because educated female become more skilled so opportunity cost of bearing children is relatively high. Consequently, it make the cause to decrease the fertility rate.

e) The GDP per capita is positively significant impact of home fertility rate. The result is opposite what we anticipated. The positive relation means that, if government increase in GDP per capita consequently, it directly contribute to foster the fertility level in Pakistan. The reason behind that, individual's living standard become high so they may well afford one more children.

f) Female labor force participation shows a negative relationship with fertility. As we know if female participation increase in work force, so there will be higher chance of fertility level seems to decrease.

Furthermore, the author also reported the value of R^2 which is 0.98, it indicates that explanatory variable in the model can predict the variance of 98 percent variance in dependent variable. Consequently, there is strong positive association between the dependent and independent variables. Moreover, the result of F-test shows that, overall model is significant because the p-value for all variables is less than 5%.

Moreover, we can also see the relation between remittances and fertility rate in (Fig.:1).It clearly indicates that there are inverse association between remittances and fertility rate with each other. As the remittances increase over time the fertility rate is decreasing (especially since 1985).

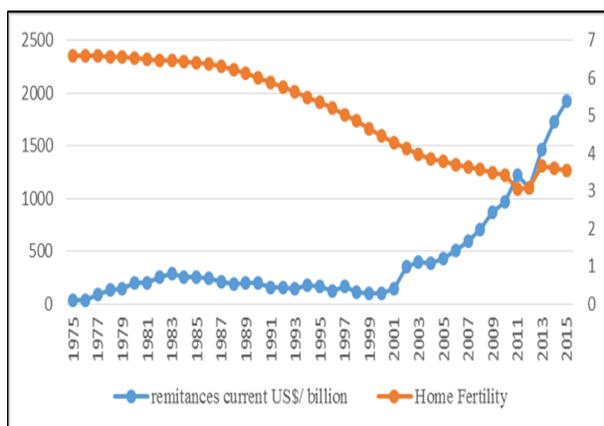


Figure:1 Relationship between remittances and Home fertility home

Moreover, if we examine the relationship between average host fertility rate and home fertility rate we found that there is strong positive correlation between

them because the (Fig.2) shows that domestic fertility it converge to the of host fertility rate over the period of time. As (Fernandez and Fogli, 2009) examine in their research that home fertility rate will close to host fertility in next generation.

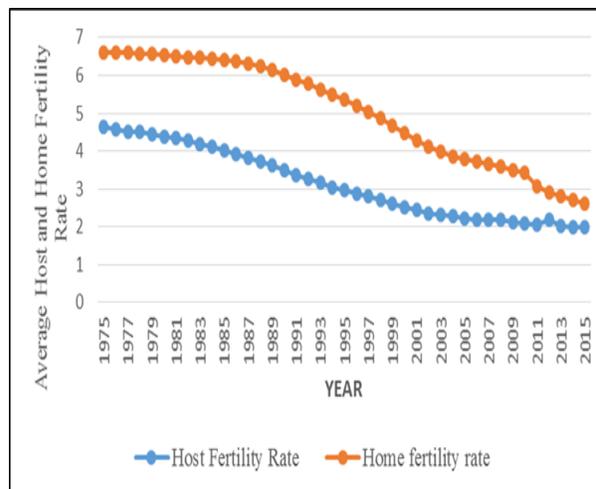


Figure: 2 Relationship between Home and Host fertility rate

5. CONCLUSIONS

In the recent decades Pakistan workers remittance is increases. In this paper we study the relationship between remittance and fertility rate using time series data in case of Pakistan. There is nexus of studies of remittance and growth but no studies regarding remittance and fertility rate we tried to fill this lacuna. We used simple OLS technique of estimation. The result determines that there is negative relationship between workers remittance and fertility rate. This result supports the intuition that migration is place from Pakistan to those countries which have low fertility rate.

The migrants are not sending only remittance in term of money back to household also migrant transmit the norms, culture and ethics from the host country to home country. This is depending on the strength of relationship between migrant and household. Remittance consider as social indicator. Remittance enlarges expenditures on health and education which reflect the lower fertility. The host fertility rate also effect on fertility rate of Pakistan. We take ten host countries fertility², from where 90% of total remittance sent to Pakistan. The results show there is positive relationship, which support the idea that there is a transition of norms from migrant to back home. The fertility rate of Pakistan is decreasing as compare to before decades but it is still high as compare to the develop counties. The fertility of Pakistan and host countries is converging as shows in Figure:2.

2KSA (27%), UAE (22%), USA (18%), UK (12%), GCC (11%) and Other (10%)

Female literacy rate and fertility rate are inversely related. Educated female is become more skilled so increasing the opportunity cost of bearing children so the women preference to have child decline, literacy effect other way on fertility rate that is more educated means more aware about medical care and contraception so the fertility rate decreases. Rural population has positive effect on fertility because the people and uneducated that do not aware of medical care and contraception, the other reason of high fertility is that they use children as an asset form for future. Furthermore, female labor force participation has negative effect but income per capita has also positive affect on fertility rate, as female participate in working activities increase so, they have less time to bearing children because the cost of bearing children become high.

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