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Economic Impact of Remittances: Does it matter how they are sent?

*Rashid Amjad and Rizwana Siddiqui**

ABSTRACT

Remittances by the Pakistani diaspora abroad have had a far reaching impact on the economy and indeed the broader socio-economic milieu. Studies on the impact of remittances have not differentiated between the impact of flow of remittances through formal and informal channels. The question posed in this paper is whether remittances through informal channels have a greater impact on domestic consumption and identifies conditions under which this impact is greater when sent through formal channel.

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I. Introduction

Remittances to Pakistan by Pakistani workers have had a far reaching impact not only on the economy but also on the broader socio-economic milieu¹ including poverty reduction. In recent years, remittances through formal channels have increased well over ten-fold from just over US\$1 billion in 2000-1 to around US\$ 13 billion in 2011-12.² This increase is attributed to many factors. Foremost among these are the shift from informal ‘(hawala)’ non-documented to formal documented channels due to tightening measures after 9/11 event to curb undocumented flows. Kock and Sun (2011) and Siddiqui (2011) suggest that this increase is the result in both numbers of Pakistanis as well as shift to higher skilled and professional categories. Initiatives taken by the government to make it easier and quicker for migrants to send their remittances through official channels have also had a positive impact.

There have been several studies³ examining the micro as well as macro impact of remittances. Most of these studies have been based on the assumption that remittances either received through formal or informal channel have a similar impact on Pakistan’s economy. However, Amjad (2010) has argued that the impact of formal and informal remittances may differ as the former injects money into the economy, while the latter represents transfer of money from one household to another. The questions posed here are: 1) Do the remittances through informal channel affect the economy? If yes, 2) Would the switch of remittance transaction from informal to formal channels bring more benefits for the economy? We explore difference in the impact of remittances through informal and formal channels. To keep the analysis simple, first we focus on only one aspect i.e., consumption⁴ of the households and develop a framework to calculate multiplier effect of change in consumption due to increase in formal and informal remittances.

II. Quantifying Economic Impact of Remittances

¹ Consumption, investment, inequality, growth, wages, exchange rate and trade, balance of payment and financial deepening.

² See Pakistan Economic Survey, 2011-12.

³ Amjad (1986, 1988, 2009); Kazi (1988); Burney (1987, 1988); Irfan (1986); Ariff (1999); Siddiqui and Kemal (2006); Siddiqui(2010, 2011); Adam(1998); Iqbal and Sattar (2005); Malik and Sarwer (1993); Maqsood and Sirajjeldin (1994); Jan(2009 . Qayyum et al (2008); Kock and Sun (2011).

⁴ Literature survey shows that a large portion of these remittances is spent on current consumption. Therefore we discuss the issue with reference to consumption.

We start with the proposition that consumption is a function of income only. First we explore income effects of formal and informal remittances.

We assume that

- There are two economies (X and Z) receiving remittances through informal and formal channels, respectively.
- They are similar in every observable characteristic except the way they receive remittances.
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(a) Income Effects Of

(i) Remittances through Informal Channel

In the informal transaction of remittances, ('hawala' or 'hundi'), total income within the country remains the same. Money transfer takes place from one household to the other. In economy X, we have three types of households: (1) Households who receive remittances through informal channel (H_{IFR}); (2) Household who send money abroad through informal channel (H_{SM}); and (3) All other households (H_{OTH}).

Mathematically, income effects can be shown in the following way.

Let Y_{Xb}^{TIFR} is total household income in economy X before the receipt of remittances through informal channel.

$$(1) Y_{Xb}^{TIFR} = Y_{Xb}^{HIFR} + Y_{Xb}^{HSM} + Y_{Xb}^{HOTH}$$

Where subscript 'b' indicates before the transaction of informal remittances

Y_{Xb}^{HIFR} = Base year Income of households who receive remittances through informal channel

Y_{Xb}^{HSM} = Base year Income of households who send money abroad through informal channel

Y_{Xb}^{HOTH} = Base year Income of all other households

With no change in income of other households, income of H_{IFR} and H_{SM} changes after the transaction of remittances as follows

$$(2) Y_{Xa}^{HIFR} = Y_{Xa}^{HIFR} + R_{XIFR} \quad \text{where } R_{XIFR} = \text{remittances through informal channel}$$

$$(3) Y_{Xa}^{HSM} = Y_{Xa}^{HSM} - R_{XSM} \quad \text{where } R_{XSM} = \text{Money sent abroad through informal channel}$$

Therefore, total households' income after money transaction is

$$(4) Y_{Xa}^{TIFR} = Y_{Xa}^{HIFR} + Y_{Xa}^{HSM} + Y_{Xa}^{HOTH}$$

Subscript 'a' indicates after the transaction of informal remittances

Substituting equation 2 and 3 in equation (4) we get

$$(5) Y_{Xa}^{TIFR} = Y_{Xb}^{HIFR} + R_{XIFR} + Y_{Xb}^{HSM} - R_{XSM} + Y_{Xb}^{HOTH}$$

Since $R_{XIFR} = R_{XSM}$, and $Y_{Xa}^{OTH} = Y_{Xb}^{OTH}$ total household income remains at the base level. We have

$$(6) Y_{Xa}^{TIFR} = Y_{Xa}^{HIFR} + Y_{Xa}^{HSM} + Y_{Xb}^{HOTH} = Y_{Xb}^{TIFR}$$

Therefore there is no change in total households income. But distribution of income has changed with increase in income of H_{IFR} and decrease in income of H_{SM} [see equation (2) and (3)].

(ii) Remittances through Formal Channel

In economy Z, there are two types of households, (1) Households who receive remittances through formal channel (H_{FR}), (2) All other households (H_{OTH}).

Let Y_{Zb}^{TFR} is total household income in economy Z in the base year before the receipt of remittances through formal channel, which is equal to sum of the income (Y_{Zb}^{HFR} , Y_{Zb}^{OTH}) of household, H_{FR} and H_{OTH} , respectively.

Let

$$(7) Y_{Zb}^{TFR} = Y_{Zb}^{HFR} + Y_{Zb}^{OTH} \quad \text{Total income of households before transfer of formal remittances}$$

After remittances transaction,

Income of H_{FR} after receipt of formal remittances

$$(8) Y_{Za}^{HFR} = Y_{Zb}^{HFR} + R_{ZFR}$$

Total income of households in economy Z after transfer of formal remittances

$$(9) Y_{Za}^{TFR} = Y_{Za}^{HFR} + Y_{Za}^{OTH}$$

Substituting equation (8) into (9), we get

$$(10) Y_{Za}^{TFR} = Y_{Zb}^{HFR} + R_{ZFR} + Y_{Za}^{OTH}$$

$$(11) Y_{Za}^{TFR} = Y_{Zb}^{HFR} + R_{ZFR} + Y_{Za}^{OTH} \text{ Since } Y_{Zb}^{OTH} = Y_{Za}^{OTH}$$

$$(12) Y_{Za}^{TFR} = Y_{Zb}^{TFR} + R_{ZFR}$$

Income increases by R_{ZFR} amount over the base year. While in case of remittances through informal channel there is no injection of money into the economy.

If remittances through formal channels (R_{ZFR}) is equal to the remittances through informal channels (R_{XIFR}), the difference between the two transactions lies in the fact that in the former transaction total household income increases by the amount R_{ZFR} ($= R_{XIFR}$) over the base year, while in the later case total households income remains at the base level but distribution of income has changed i.e., resources shift from H_{XSM} to H_{XIFR} .

The income differential between the two economies after remittance transaction can be calculated in the following way.

In the base year,

$$(13) Y_{Zb}^{TFR} = Y_{Xb}^{TIFR}$$

After receipt of remittances

$$(14) Y_{Za}^{TFR} = Y_{Zb}^{TFR} + R_{ZFR}$$

$$(15) Y_{Xa}^{TIFR} = Y_{Xb}^{TIFR}$$

Therefore,

$$(16) Y_{Za}^{TFR} = Y_{Xa}^{TIFR} + R_{ZFR} \text{ since } Y_{Zb}^{TFR} = Y_{Xb}^{TIFR}$$

$$(17) Y_{Za}^{TFR} - Y_{Xa}^{TIFR} = R_{ZFR}$$

Equation 17 shows that after remittance transaction, total household income of economy Z increases by the amount equal to R_{ZFR} .

(b) Consumption Effects of⁵

(b1) Remittances through Informal Channel

Now we assume that there is no demonstration impact on the consumption of the families who do not receive remittances (H_{OTH}). We assume consumption (C) is a function of income (Y) only. It is estimated for three groups of households in the base year for the economy X , H_{IFR} , H_{SM} , H_{OTH} .

$$b. C_{kbX} = \alpha_{kbX} + \beta_{kbX} Y_{kbX} + \mu_{kbX}$$

Where $k = H_{IFR}, H_{SM}, H_{OTH}$. If β_X is marginal propensity to consume of all households in the country, it can be defined as weighted average of MPCs of the three groups of households before and after the receipt of remittances as follows:

$$\beta_{Xi} = \sum(\delta_k \beta_{ki}) \text{ where } \delta = \text{weight and } \sum \delta = 1 \text{ where } i \text{ stands for b(before) and a(after)}$$

Given there is no demonstration impact on consumption of the households H_{OTH} , we estimate equation 18 for H_{IFR} and H_{SM} for two time periods – before and after receipt of informal remittances and test the following hypothesis

$$(1) H_0: \beta_{IFRb} - \beta_{IFRa} = 0 \text{ against } H_1: \beta_{IFRb} - \beta_{IFRa} \neq 0$$

$$(2) H_0: \beta_{SMb} - \beta_{SMa} = 0 \text{ against } H_1: \beta_{SMb} - \beta_{SMa} \neq 0$$

Given the number of households remains the same after the transfer of money, if we reject the null hypotheses, then MPC of households for the whole economy changes to β_{bX} . We test following hypothesis that weighted average of marginal propensity to consume (MPC_w) of three group of households— H_{IFR} , H_{SM} , H_{OTH} – before money transaction is equal to the MPC_w after the money transaction or not

$$H_0: \beta_{bX} = \beta_{aX} \text{ against } H_1: \beta_{bX} \neq \beta_{aX}$$

⁵ Generally, household who receive remittances belong to the lower income groups and thus they increase their consumption on the receipt of remittances. On the other hand, the households who send money abroad belong to the upper and middle income groups class, they transfer money from their saving without affecting their current consumption. In that case, the demand side impact will depend solely on the change in consumption of remittance receiving households (H_{IFR}). Hence, MPC at the aggregate level will change if the MPC of remittance receiving household change after the receipt of remittances that will have growth promoting impact iff $MPC_a^{IFR} > MPC_b^{IFR}$ with no change in MPCs of other two groups of households. On the other hand, decline in saving of H_{SM} deteriorate future growth prospects as it negatively affects investment prospects directly or through disintermediation process of the banks.

If we reject nul hypothesis, MPC_X will have changed after the transaction, the macro-economic effect originating from change in consumption is measured by multiplier (M) defined in equation 19 which represents the magnitude of direct and indirect effects of a unit change in consumption.

$$(19) M_{iX} = \frac{1}{1-MPC_{iX}} = \frac{1}{1-\beta_{iX}}$$

The impact on the economy will depend on the conditions given in Table 1.

Table 1. How Remittances through Informal Channel Affects Economy (X)*

No	MPC_{HIFR}	MPC_{HSM}	MPC_w	Multiplier(M)	Aggregate effect on the economy
1	$a > b$	$a > b$	$a > b$	$a > b$	+
2	$a < b$	$a > b$	$a > b$	$a > b$	+
			$a < b$	$a < b$	-
3	$a > b$	$a < b$	$a > b$	$a > b$	+
			$a < b$	$a < b$	-
4	$a < b$	$a < b$	$a < b$	$a < b$	-
5	$a = b$	$a = b$	$a = b$	$a = b$	No change

*a = after and b = before, w= weighted average, MPC = Marginal propensity to consume

The table 1 compares MPCs of the remittances receiving household, money sending households, and weighted average of MPCs'. If MPC_w after transaction of remittances is larger/smaller than before the remittances transaction, the multiplier will also be larger/smaller after the money transaction. Consequently, economy will bear positive/negative effects of remittance inflows (see row 1 and 4 in Table 1). If MPC of any one group of the two groups of households (H_{IFR} H_{SM}) reduces after the money transaction, and the decline in MPC dominates, then MPC_w declines as well as multiplier that will affect the economy negatively (see row 2 and 3 in Table 1). If there is no change in MPCs, multiplier will not change. Consequently, economy will remain at the level where it was before the money transaction (see row 5).

(2) Remittances through Formal Channel

In economy Z, we have two types of households. Again we assume that there is no demonstration impact on the consumption of the families who do not receive remittances (H_{OTH}), therefore, the impact on economy Z depends on the consumption response of households (H_{FR}) only.

To quantify the difference in the impact of remittances through formal and informal channels, we assume that remittances through formal channels are equal to the amount of remittances through informal channel. We now estimate equation (18) before and after the receipt of remittances for H_{FR} as MPC of H_{OTH} will not change after remittance transaction. We test the following hypothesis

$$(1) H_0: \beta_{FRb} - \beta_{FRa} = 0 \quad \text{against } H_1 : \beta_{FRb} - \beta_{FRa} \neq 0$$

Given the number of households remains the same after the transfer of money, if we reject the null hypotheses, then weighted average of MPC for the whole economy (β_{bz}) \neq β_{az} will change.

Where $\beta_{zi} = \sum(\delta_m \beta_{mi})$ where δ = weight and $\sum \delta = 1$, i stands for b(before) and a(after) and m stands for H_{FR} H_{OTH} .

Since β_z has changed after the transaction, the macro-economic effect originating from change in consumption is measured by Multiplier (M) defined in equation 19 for economy Z.

The impact on the economy will depend on the conditions given in Table 2.

Table 2. How Remittances through Formal Channel affects Economy(Z) *

No	MPC_{HFR}	MPC_w	Multiplier	Aggregate effect on the economy
1	$a > b$	$a > b$	$a > b$	+
2	$a < b$	$a < b$	$a < b$	-
3	$a = b$	$a = b$	$a = b$	No change

*a = after and b = before, w= weighted average, MPC = Marginal propensity to consume

Table 2 compares MPCs of the remittances receiving household and weighted average of MPCs' of all households before the receipt of remittances with MPCs after the receipt of remittances in economy Z. If $MPC_{HFRa} >$ or $<$ MPC_{HFRb} , then MPC_w after transaction of money is larger/smaller than before the money transaction, the multiplier will also be larger/smaller after the money transaction and economy will bear positive/negative effects of remittance inflows (see row 1 and 2 in Table 2). If there is no change in MPCs, multiplier will not change. Consequently, economy will remain at the level where it was before money transaction (see row 3).

(C) A Comparative Analysis

We have assumed that there is no difference in observable characteristics of households who receive remittances through formal channels and the households who receive remittances through informal channels. We have also assumed that households receive equal amount of remittances but from different channels. Therefore, their consumption response to the increase in income will be, similar, i.e, $\beta_{xb} = \beta_{zb}$. After, remittances transaction in the two economies, X and Z, the difference in the impact of remittances lies in the weighted average of MPCs for the economy as a whole.

The aggregate MPCs for both economies X and Z are described below

$$\beta_{Xi} = \sum(\delta_{kX}\beta_{kX})$$

$$\beta_{Zi} = \sum(\delta_{mZ}\beta_{mZ}) \text{ where } i \text{ stands for a(after) and b(before)}$$

$$\sum\delta_{kX} = \sum\delta_{mZ} = 1$$

If $\beta_{Za} > \beta_{Xa}$, then multiplier $M_{Za} > M_{Xa}$ Since $\beta_{Zb} = \beta_{Xb}$ and $M_{Zb} = M_{Xb}$ by assumption. The effects originating from consumption of households who receive remittances through formal channels have larger economic impact.

Due to data limitation, we are unable to test the hypotheses empirically. However, we can overcome this problem by using propensity score matching (PSM) and difference in difference (DID) approaches (see Siddiqui 2010).

III. Conclusion

Two important observations can be made from the above analysis. (1) Remittances coming through informal channels bring positive effects if and only if aggregate households' marginal propensity to consume increases after redistribution of income. (2) Remittances through formal channel have larger impact on the economy than that of remittances through informal channel.

At this stage, the analysis is very limited focusing only on the consumption of households. While there are a large number of other channels through which remittances can affect the economy even without changing MPCs. Some of them are described below.

1. Changing structure of production and trade.
2. Expansionary impact of the remittances can be inflationary in the short run assuming there is no idle capacity.
3. Reallocation of resources affect saving and investment directly or indirectly through disintermediation process of banks.
4. Increase in consumption expenditure of remittances receiving households can have spillover effect.
5. Bank's 'remittance sterilization' process may negate or reduces above mentioned impact.

These issues need to be addressed before drawing definitive conclusions about the impact of formal and informal remittances. To capture all these affects, one needs to develop a framework that takes into account whole economy.

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