Responses to referees' comments

"Through Which Channels Can Remittances Spur Economic Growth in MENA Countries?"

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We would like to thank reviewers for their insightful comments on the paper, as these comments led us to improve our paper. Our revisions reflect all reviewers' suggestions. Detailed responses to reviewers are given below:

Point 1:

Reviewers' comments: "Extensive literature has been cited. However, the theoretical underpinnings of the effect of remittances on growth are not clear".

Response to reviewers

The various pathways or channels through which remittance receipts could affect economic growth are evidenced in page 3 of the paper. Remittances act on economic growth mainly through indirect channels.

As a first indirect effect, the empirical literature suggests the existence of a robust and negative relationship between output growth and its volatility (Hnatkovska and Loayza, 2003; IMF, 2005 and World Bank, 2006): by reducing volatility, remittances indirectly increase the growth rate.

The second channel suggest that remittances indirectly increase growth rate by speeding up the development of the financial sector (Giuliano and Ruiz–Arranz, 2009; and Aggarwal et al., 2010).

The third channel indicate that remittances may indirectly affect growth rates via real exchange rates: remittances inflow causes a real appreciation which will in turn spur the economic growth (Lopez, Molina, and Bussolo, 2007; Lartey, Mandelman, and Acosta, 2008).

The two other indirect effects of remittances on growth are the effects on human capital formation, through education (Cox-Edwards and Ureta, 2003; Lopez-Cordova, 2005; Yang, 2008; Calero et al., 2009 and Adams and Cuecuecha, 2010), and the effects on investment in microenterprises (Massey and Parrado, 1998; Woodruff, 2007; Woodruff and Zenteno, 2007).

Point 2

Reviewers' comments: "Given the level of disaggregation the paper claims, it would have been informative to establish the theoretical link between disaggregate data and remittances flow."

Response to reviewers

Answers to questions 1, 3, 4, 5 and 9 develop theoretical links between remittances on one hand and growth, school enrollment, openness, financial development, government spending, consumption and investment on the other hand.

Point 3:

Reviewers' comments: "There is significant correlation in Table 2 between secondary school enrollment and remittances. How does this relationship develop?"

Response to reviewers

Remittances may affect school enrollment mainly by increasing the family's revenue. The revenue channel may act in two complementary ways.

First, additional revenue will help low income families to finance their children's schooling expenses.

Second, low income families often enforce their children to work. Hence, the additional revenues offered by remittances may contribute to reduce the children's work time, which enables them to dedicate more time to school and to pursue their studies in better conditions.

Point 4

Reviewers' comments: "What explains other significant correlation in Table 2 between remittances and openness and credit growth? The latter is worthy of attention and explanation."

Response to reviewers

The relationship between remittances and openness stems from the positive effect that migration produces on trade. While traditional recardian models consider trade and migration as substitutes, new extensions of these models suggest a complementarity relationship under specific conditions (Venables, 1999). The new trade theory, based on models with increasing returns to scale, also demonstrates that migration and trade are complements (Krugman, 1995). Numerous empirical studies show that trade and migration are becoming positively and increasingly connected. Hence, an increasing number of migrants accelerate simultaneously remittances and trade between countries.

The relationship between remittances and financial development and its impact on growth was the object of an extensive empirical literature. Two contradictory conclusions emerge from this literature. The remittances effect on growth is stronger in countries with developed financial systems. Financial development leads to an efficient use of these capital inflows (Bettin and Zazzaro, 2009). Other results suggest that remittances enhance growth in countries with less developed financial systems. In this case they simply substitute to the existing financial system by offering an alternative source of funding to small investors (Giuliano and Ruiz-Arranz, 2009).

In both cases remittances and financial development indicators will show positive correlation. In the first case developed financial systems are more attractive for remittances, whereas in the second case remittances will promote financial development through financial inclusion: number of new small investors that beneficiated from remittances will integrate the financial system after the implementation of their projects (Toxopeus and Lensink, 2007).

Point 5:

Reviewers' comments: "There is also a positive and significant correlation between remittances and government spending. What is the channel underlying the correlation and what are the implications for growth? ".

Response to reviewers

The correlation between remittances and government spending can be seen from two manners:

First, more remittances from workers to their homes in less developed countries may allow households to send children to school rather than to the labor market. Therefore, more remittances need more public spending in education, health, infrastructures to foster the need of the population.

Second, from an economic policy perspective, government spending, mainly in infrastructure, can been seen as a prerequisite to fostering economic development in less developed countries by developing the needed public investment to go along with private investment.

In both cases, remittances inflows to developed countries require public investment alongside with the private one, which in turn generates more economic growth.

Point 6

Reviewers' comments: "It is interesting to note that the effect of remittances on consumption is larger, compared to that on investment. What are the implications for growth? The individual country analysis should have illustrated time-series correlation between remittances growth and consumption growth."

Response to reviewers

When remittances are allocated to consumption, they produce no effect on growth, as discussed in point 9.

The following table presents the correlation matrix of variables included in models 2 and 3. We can notice a high positive and significant correlation between consumption and remittances (0.684).

	Investment	Consumption	PCGDP growth	Real PCGDP	Lending rate	Deposit rate	Remittances
Investment	1.000						
Consumption	0.035	1.000					
PCGDP growth	0.068	0.094	1.000				
Real PCGDP	-0.209	-0.337**	0.192	1.000			
Lending rate	0.078	0.421***	0.378***	-0.201	1.000		
Deposit rate	0.132	0.165	0.378***	-0.031	0.755***	1.000	
Remittances	0.217	0.684***	0.285**	-0.041	0.275*	0.254*	1.000

Point 7:

Reviewers' comments: **"**What are the characteristic of "restricted group of countries" for which remittances stimulate investment growth? ".

Response to reviewers

Our results suggest that the remittances' effect on growth is mainly due to their effect on investment, and that this channel is valid only for a restricted group of countries. While in countries such as Oman, Egypt and Djibouti remittances are highly correlated to investment whereas countries such as Iran, Algeria and Yemen show a strong negative correlation between remittances and investment. Our regressions support the fact that remittances effect on growth is due to the investment channel. We split our sample into two groups according to the remittances-investment mean correlation. We call *high correlation* the group composed of Oman, Egypt, Djibouti, Syria, Morocco, Jordan and Sudan, and *low correlation* the group composed of the eight remaining countries. We show that remittances do not produce any significant effect on growth in countries where they are used for consumption. This conclusion concerns only a restricted group of the sample countries. This difference in results between the two groups of countries can be explained from an economic policy perspective: governments implementing policies encouraging the investment use of remittances to foster their effect on growth. Lack of incentives and/or investment opportunities could be the main factor driving this negative correlation between the effects of remittances on the investment-growth nexus.

Point 8:

Reviewers' comments: **"**There are also sharp contrasts between the effects of remittances on consumption across country groups. What explains these differences?"

Response to reviewers

We thank the reviewer for bringing this critical point to our attention. Consumption and investment behavior is different across countries due to two main reasons:

First, as mentioned in the literature section and as highlighted by several authors, financial development across country groups is a factor that plays a crucial role in explaining this difference in remittances' effect on consumption. As we mentioned in the paper, empirical evidence in this regard suggests that these external monetary flows are particularly used for investment where the financial sector does not meet the credit needs of local entrepreneurs (Giuliano and Ruiz-Arranz, 2009). Other studies provide evidence suggesting that development of the financial sector increases growth rate and remittances indirectly increase growth rate by speeding up the development of the financial sector (Giuliano and Ruiz–Arranz, 2009; and Aggarwal et al., 2010).

In countries with developed financial sectors, the banking system plays a crucial and an active role in canalizing remittances. However, countries lacking a sound banking and financial systems, remittances are rather consumed than invested.

Second, consumption and investment among other factors, behavior depends on cultural aspects of economic agents that define different consumption and investment percentage. Therefore remittances can have different effects on consumption across country groups.

Point 9

Reviewers' comments: "Why countries that consume remittances are not benefiting in terms of growth?".

Response to reviewers

Three main reasons may explain why consumed remittances do not produce any effect on growth.

First, remittances may act as compensatory revenues which role is just to stabilize households' consumption patterns (Chami et *al.*, 2005).

Second, remittances can cause adverse behavioral changes at the household level that may lower their development impact relative to income from other sources. Studies supporting this kind of relationship argue that a significant portion of remittances flows are spent in "status-oriented" consumption and that a smaller part goes into economically unproductive saving and investments, mainly in housing, land and jewelry (Chami, Fullenkamp and Jahjah, 2003).

Finally, remittances can reduce labor market participation rates as receiving households opt to live of migrants' transfers rather than by working (Chami *et. al*, 2003).

In all three cases remittances will produce no significant effect on growth.

Point 10

Reviewers' comments: "Is there empirical evidence that remittances are used to finance schooling expenses?"

Response to reviewers

We argued in point 3 that revenue is the main channel through which remittances may influence children's scholarship. Bansak and Chezum (2009) showed that in Nepal remittances had a significant effect on the families' decision to invest in their children's scholarship. Yang (2008) showed that remittances influence positively schooling expenses in Philippines.

However, most of the recent empirical literature focused on assessing the remittances effect on different schooling indicators.

Edwards and Ureta (2003) report a high positive correlation between remittances and student retention rates in ElSalvador' schools.

Examining data from 2400 Mexican municipalities, Lopez-Cordova (2005) finds that remittances contribute to reduce analphabetism by 40% and to promote school enrollment by 4%.

Based on Mexican data, Hanson and Woodruff (2003) find that remittances extended the duration of studies by 0.7 to 1.6 years.

In Indonisia, Painduri and Thangavelu (2011) found that remittances increased the probability of observing children continuing their studies by 23%.