

The Impacts of International Migrants' Remittances on Household Consumption Volatility in Developing Countries

Abstract

This study measures the impacts of remittances on reducing volatility of household consumption using a panel dataset of 84 developing countries during the period from 1978 to 2012. This study shows that the volatility of household consumption can significantly be reduced by international migrants' remittances. The robustness checks reinforce the stabilising impact of migrants' remittances on consumption volatility in developing countries. Since the overall consumption is an integral part of household welfare, the findings of this study highlight that international migrants' remittances may indeed contribute significantly to households' welfare through reducing the volatility of consumption in remittance receiving developing countries.

Keywords: Remittances, Consumption Volatility, Developing Countries, System GMM, Communist countries.

1. Introduction

Over the past two decades, the flows of international remittances among different nations have increased dramatically due to globalisation. Moreover, migrants' remittances have been considered as a growing private source of external finance in developing countries after foreign direct investment (FDI). For instance, migrants' remittances to developing countries were approximately three times larger than official development assistance (ODA) and almost half of FDI that those countries received in 2011 (Ratha, 2013). In addition, remittance flows to developing countries were more stable than other financial flows even when the global economy had been affected by the global financial crisis in 2009 (Ratha, 2013). In 2014, international remittances to developing countries were \$436 billion and are projected to reach \$479 billion by 2017 (World Bank, 2015).

Despite the increasing volume and stable nature of international remittances to developing countries, relatively little attention has been paid to its contribution to household consumption smoothing. Since the volatility of household consumption might be increased due to the output shocks caused by trade liberalisation in an economy to a greater extent, it might inversely affect the household welfare in developing countries (Ahmed & Suardi, 2009; Di Giovanni & Levchenko, 2009). Therefore, it is indeed necessary for the policymakers to rethink the determinants of economic stabilisation giving emphasis on consumption smoothing. While it is obvious that international remittances may act as a shock transmitter to the remittance recipient countries during the economic downturn in migrants' host countries, remittances can also play a role as a shock absorber in stabilising the output volatility as well as consumption volatility caused by internal negative shocks such as devastating natural disasters (Jidoud, 2015; Bettin, et al., 2014).

Therefore, the main focus of this study is to measure the role of remittances in stabilising the volatility of household consumption in developing countries. This study has also considered the possible bias in the measurement of consumption volatility caused by the difference in the public goods distribution system between the communist and non-communist developing countries. Hence, the major research questions, this study tries to answer are: Do remittances significantly reduce household consumption volatility? And, does the inclusion of communist countries in

the sample affect the measurement of the impact of remittances on consumption volatility? This study tries to answer these questions using a new panel dataset composed of 84 developing countries for which reasonable information of remittances and other required variables are available. The system GMM estimation is used to address the possible biases due to reverse causality and potential endogeneity of remittances in this paper. The OLS and the Instrumental Variable (IV) estimations are also used to check the consistency of the results. The ratio of remittances to GDP for neighbouring countries and the log weighted GDP per capita of five top most migrants' host countries are used as two external instruments expecting that the potential "weak instrument" problem of traditional GMM estimator would be weakened. Controlling for all other factors, we find evidence that international migrants' remittances significantly contribute to stabilising the volatility of household consumption in developing countries. However, the magnitude of this stabilising impact of remittances is stronger while the influences of the communist countries are excluded from the sample.

The rest of the study is organised as follows. Section 2 presents a detailed review of existing literature on international remittances. Section 3 discusses the relationship between international remittances and the volatility of household consumption. Section 4 describes the data sources and empirical strategy used in this study. Section 5 discusses the empirical findings of this study and Section 6 concludes.

2. Review of literature

The impacts of remittances on household welfare, poverty reduction and income inequality have been studied by many researchers. Some researchers found that the depth and severity of poverty can greatly be reduced by the inflow of foreign remittances (Acosta, et al., 2008; Adams & Page, 2005; Gupta, Pattillo & Wagh, 2007; Brown, & Jimenez, 2007). The study conducted by Jimenez & Brown (2012)'s in Tonga found that 31 percent of the national poverty rate can be reduced through remittances, while their impact on the depth of poverty is about 49 percent. Moreover, household welfare, as well as income and consumption expenditures, can also be increased through remittances received by family members. In addition, large

households and particularly female headed households may enjoy greater income stability due to remittances received (Catalina & Pozo, 2011). Seemingly, other non-migrant households, mostly relatives and friends, may also benefit from international migrant households through sharing norms and social pressures (Brown, et al., 2014). Evidence also shows that remittances may sometimes worsen income inequality and rural-urban inequality in the remittance receiving country, mainly because incomes via remittances tend to be invested mostly in the urban sector (Carling, 2004). Similarly, Adams and Cuecuecha (2010) found an increasing Gini coefficient of inequality when remittances are included in household income in Indonesia. On the other hand, Acosta, et al. (2008) found a negative correlation between international remittances and income inequality in Latin American and Caribbean countries.

The impacts of remittances on growth have been studied by a number of researchers and many of them found a positive effect of remittances on economic growth, while others found the opposite. For example, some studies (Giuliano & Ruiz-Arranz, 2009; Helen & Robert, 2007) argued that international remittances can positively contribute to economic growth in developing countries in the absence of a properly functioning credit market. In a similar study, Zuniga (2011) has pointed out that the positive relation between remittances and economic growth while the impact may vary with geographical distributions of remittance receiving countries. However, Ahamada & Coulibaly (2013) found no causal relationship between remittances and economic growth in Sub-Saharan countries. Similarly, some studies (see, for example, Barajas, et al., 2009; Chami, et al., 2005) found that economic growth may sometimes be negatively affected by remittances.

Several other studies (see, for example, Bugamelli & Paterno, 2009, 2011; Chami, Hakura & Montiel, 2009) examined the impact of remittances on output growth (GDP per capita) stabilisation in developing countries and found positive effects. Anzoategui et al. (2014) and Demirgüç-Kunt et al. (2011) found that remittances can strengthen the financial development of the recipient country and can be used to meet its needs during negative income shocks (Osili 2007). In another recent study, Mohapatra, et al. (2012) found that remittances had been used as an *ex post* coping strategy during natural disasters such as floods, droughts and earthquakes in order to smooth household consumption in countries such as Bangladesh and

Ethiopia. They also found that remittances had also been used as *ex ante* investment as part of risk management after negative income shocks in Burkina Faso and Ghana, where remittance receiving households built their houses with concrete rather than mud. Bettin, et al. (2014) found a negative correlation between remittances and the business cycles.

Although the impacts of international remittances on a wide range of issues have been investigated by the existing literature, the study of the impact of migrants' remittances on household consumption volatility is very limited. To our knowledge, only Combes & Ebeke (2011) examined the impacts of remittances on household consumption instability in developing countries using data from 1975 – 2004. They found that remittances can significantly reduce the consumption instability in developing countries by playing the role of insurance during periods of negative income shocks. However, the influences of government investment on fixed capital formation have not been considered in their study. The present study has considered this variable since the government investment on fixed capital formation is an important factor that largely affects the aggregate household consumption. Moreover, present study has also considered the possible bias in the measurement of consumption volatility caused by the difference in the public goods distribution system between communist and non-communist developing countries. Moreover, this study has used the most recent data available up to 2012, which certainly captures the effect of the global financial crisis 2009 on international remittances. Therefore, this study will be an important addition to the existing literature.

3. International remittances and the volatility of household consumption

Following the work of Bugamelli & Paterno (2009), Combes & Ebeke (2011), and Jidoud (2015), the standard deviation of household consumption per capita growth is defined as the volatility of consumption in this study. Although the volatility of private consumption is driven by a number of factors such as economic shocks, the factors of household income elasticity to these shocks, and the factors of household consumption elasticity to household income shocks, various country characteristics

are also responsible for household consumption volatility (Wolf, 2004). For instance, large economies with diversified production tend to positively affect the volatility of consumption. Likewise, volatility in fiscal policy can also be associated with consumption instability (Herrera & Vincent, 2008).

[Fig. 1(a) is about here]

However, the trends of consumption volatility in different regions for all developing countries in figure 1(a) show that the household consumption in developing and transitory economies in the Europe and Central Asia (ECA) region and the South Asia (SA) region is more volatile as compared to other regions in all developing countries. In contrast, the other regions such as East Asia and the Pacific (EAP), Latin America and the Caribbean (LAC), the Middle East and North Africa (MENA), and Sub-Saharan Africa (SSA) regions have experienced an overall decreasing trend in consumption volatility during the period 1978 to 2012. Even though the SSA region shows a decreasing trend in consumption volatility, the volatility of consumption is still higher in that region compared to other regions shown in figure 1(a).

[Fig. 1(b) is about here]

In addition, the trend in consumption volatility of the developing and transitory economies of the Europe and Central Asia region has changed substantially while all the former and present communist countries are excluded from the sample as shown in figure 1(b). As well as this, the East Asia and Pacific region also has experienced a considerable change in the trend of consumption volatility while all communist countries are excluded from the sample. These findings could be a reason to rethink the measurement of the impact of remittances on consumption volatility assuming a possible bias caused by the nature of the public goods distribution system of former and present communist countries within the group of developing countries. Since some regions with a low (high) level of remittances do not always produce a

high (low) level of consumption volatility in the given data for our analysis, it seems difficult to confidently predict an inverse relationship between migrants' remittances and the volatility of consumption. However, the East Asia and Pacific region and the Sub-Saharan Africa region of all developing countries (including all former and present communist countries) and the Sub-Saharan Africa region while excluding all communist countries, are characterised by the low level of remittances with a high level of consumption volatility. In contrast, the Middle East & North Africa region has experienced a high level of remittances with a low level of consumption volatility in our given dataset. Therefore, these findings could be a sign of the impact of remittances on the volatility of household consumption, which this study tries to investigate further in the empirical analysis.

4 Empirical Strategy and Data

We use the following empirical specification to estimate the impact of international remittances on consumption volatility in developing countries.

$$\begin{aligned} \sigma_{i,t}^c = & \alpha + \rho\sigma_{i,t-1}^c + \varphi_1 R_{i,t} + \beta_1 IniGDP_{i,t} + \beta_2 Gov_con_{i,t} \\ & + \beta_3 Trade_open_{i,t} + \beta_4 GDP_volatility_{i,t} \\ & + \beta_5 Inv_volatility_{i,t} + \beta_6 Bank_credit_{i,t} + \beta_7 Aid_{i,t} \\ & + \beta_8 Finan_open_{i,t} + v_i + \mu_t + \epsilon_{i,t}, \end{aligned}$$

where σ_{it}^c is defined as the consumption volatility and is estimated by the standard deviation of the real consumption per capita growth over non-overlapping 5-year periods. Country and non-overlapping 5-year periods are expressed by i and t respectively and their corresponding fixed effects are indicated by v_i and μ_t respectively. Thus, time invariant heterogeneity is expected to be controlled by μ_t and periodical shocks among countries are expected to be controlled by v_i . The idiosyncratic disturbance term is denoted by $\epsilon_{i,t}$. R is denoted as the remittance variable, measured as the ratio of personal remittances received to GDP. Following the World Bank's (2010) definition, the remittance variable is comprised of migrant workers' remittances and compensations of employees. In the baseline specification, the standard deviation of household consumption per capita growth (σ_{it}^c) is a function

of the ratio of remittance to GDP ($R_{i,t}$), the log of initial GDP per capita ($IniGDP_{i,t}$), the ratio of government consumption to GDP ($Gov_con_{i,t}$), the ratio of trade openness to GDP ($Trade_open_{i,t}$), the output growth volatility ($GDP_volatility_{i,t}$), the government investment growth volatility ($Inv_volatility_{i,t}$), the ratio of bank provided private sector credit to GDP ($Bank_credit_{i,t}$), the ratio of foreign aid to GDP ($Aid_{i,t}$), and the financial openness ($Finan_open_{i,t}$). The key coefficient of interest is φ_1 which shows the correlation between remittances and the volatility of household consumption. A negative sign of the remittances coefficient, $\varphi_1 < 0$, offers evidence in favour of the stabilising impact of remittances on household consumption volatility. Since the initial level of income could capture the heterogeneity of a country's technological progress (Sala-i-Martin, 1994; Barro, 1991), the $IniGDP_{i,t}$ is included, with the expectation that the volatility of consumption would be higher in lower per capita income countries than that of the higher income countries.

In order to control the size of the government, the $Gov_con_{i,t}$ variable is used such that a larger government size could be associated with macroeconomic instability and economic inefficiency in developing countries (Bekaert et al., 2006). Therefore, the consumption volatility may exhibit a positive relationship with the size of the government in developing countries. Likewise, the trade openness variable is also used expecting a positive correlation ($\beta_3 > 0$) with the consumption volatility (Di Giovanni & Levchenko, 2009). In addition, a positive sign for the $GDP_volatility_{i,t}$ variable, $\beta_4 > 0$, is expected to grasp the collective shocks on volatility of household consumption in developing countries (Herrera & Vincent, 2008; Combes & Ebeke, 2011). Since government investment in fixed capital formation, such as investment in land improvements, construction of roads, schools, hospitals and so forth, is an important factor for facilitating household consumption, $Inv_volatility_{i,t}$ is included expecting a positive relation, $\beta_5 > 0$, with consumption volatility. Again, the $Bank_credit_{i,t}$ variable is included to capture the financial development of a country assuming that the efficiency of the financial market could largely influence the extent of consumption volatility in developing countries (Ahmed & Suardi, 2009; Bekaert et al., 2006). Since the availability of bank provided private sector credit is an important

determinant for household consumption smoothing, the ratio of bank provided private sector credit to GDP is treated as the proxy for financial development (Combes & Ebeke, 2011). Two alternative variables, namely broad money (M2) to GDP ratio (M2/GDP), and the banks' deposit to GDP ratio are used as alternative measures of financial development to reexamine the stabilising role of remittances on the consumption volatility. The financial openness variable is used to capture the effect of the global financial systems on consumption volatility. Nevertheless, the dynamic nature of the consumption volatility is captured by the lag level of the dependent variable.

The estimation of the above equation using the Ordinary Least Squares (OLS) estimator will be biased and inconsistent because the lagged dependent variable is correlated with the error term due to the presence of fixed effects (Combes & Ebeke, 2011). Hence, the system GMM estimator is employed in this study since it allows for the lagged differences and lagged levels of the explanatory variables as an instrument. The potential endogeneity of remittances and other explanatory variables would be controlled by the system GMM estimator (Blundell & Bond, 1998). Additionally, two external instruments are used with the expectation that the potential "weak instruments" problem of the traditional GMM estimator would be weakened. These external instruments are: (1) the ratio of remittances to GDP for neighbour countries located in the same region and (2) the log-weighted GDP per capita of the five top most migrants' host countries (Acosta, Baerg & Mandelman, 2009; Aggarwa et al., 2011). The first instrument is used to capture the regional trend of remittances in remittance receiving countries, including changes in transaction costs, while not affecting the consumption volatility in recipient countries. In addition, the impact of the economic condition of the migrants' host countries on the flow of remittances will be captured by the later instrument, assuming that the economic condition of migrants' host countries is not directly related with the consumption volatility of the recipient countries. Since the consistency of the GMM estimator depends on the validity of the instruments, two specification tests are used: (1) the Hansen test for over-identifying restrictions assuming the null hypothesis that the instruments are valid overall and (2) the autocorrelation test which examines the hypothesis that there is no second-order serial correlation in the first differenced error term (Arellano & Bond, 1991;

Roodman, 2009). Moreover, the OLS and the Instrumental Variable (IV) approaches are also used to check the consistency of the results obtained by the system-GMM estimator.

4.1 Data sources

The World Development Indicator 2014 is used as the main source of data for constructing a large panel consisting of at most 84 developing countries over the period from 1978 to 2012. Additionally, data for the variables of private credit ratio and bank deposit ratio were collected from the Global Financial Development database 2014 of the World Bank for the same periods. The dataset is then rearranged into 7 observations by taking the average of non-overlapping 5-year periods. As a result, 7 observations per country were available in the panel dataset for this study (1978-82, 1983-1987, 1988-1992, 1993-1997, 1988-2002, 2003-2007, 2008-2012). The precise definition of each variable and their sources are shown in table 1.

[Table 1 is about here]

The financial openness variable is measured using KAOPEN from the Chinn-Ito Index (2014) which measures the degree of openness of a country's capital accounts. A greater value of this index of a country expresses the more open that country is to cross-border financial transactions. Chinn & Ito (2008) have used the following four major categories of restrictions on external accounts in construction of the KAOPEN index: (1) the presence of multiple exchange rates, (2) the restrictions on current account transactions, (3) the restrictions on capital account transactions, and (4) the requirement of the surrender of export proceeds (Combes & Ebeke, 2011; Kose, Prasad & Terrones, 2003). Summary statistics of different variables in all developing countries are presented in table 2.

[Table 2 is about here]

5. Results and Discussion

5.1 Empirical results

Across all estimations, the log of initial GDP per capita, the ratio of government consumption to GDP, the ratio of trade openness (total trade volume) to GDP, the output growth volatility (standard deviation of GDP per capita growth), the government investment volatility (standard deviation of government investment growth), the ratio of available bank credit to GDP, the ratio of aid inflow to GDP, and the financial openness variables are used as control variables in this study.

Table 3 shows the impacts of remittances on the volatility of household consumption in all developing countries (including former and present communist countries). The Ordinary Least Squares (OLS) technique has been estimated using the country and time fixed effects based on the Hausman test for fixed effects without considering the dynamic nature of the panel dataset. After controlling for all other explanatory variables, the results reveal that the coefficient of the ratio of remittances to GDP is about 0.10 which is negative and is statistically significant at the one percent level. It suggests that the standard deviation of household consumption growth is decreased due to an increase in the ratio of remittances to GDP, which is, in turn, related to a decrease in consumption volatility in developing countries. Among all the control variables included in the OLS estimation, the coefficients for the ratio of government consumption to GDP, the ratio of trade openness to GDP, the standard deviation of GDP per capita growth (output growth volatility), and the standard deviation of government investment growth (govt. investment volatility) are positive and statistically significant, meaning that consumption volatility increases due to the increase in those variables. On the other hand, the coefficient for the ratio of available bank credit to GDP is also statistically significant and negatively related to the volatility of consumption. Therefore, the consumption volatility decreased due to an increase in the ratio of bank credit to GDP in the private sector. Although the coefficients for other control variables such as log of initial GDP per capita, the ratio of aid flow to GDP, and the financial openness have the sign as expected, these are not statistically significant in the OLS estimation.

[Table 3 is about here]

The results obtained using the instrumental variable (IV) estimation considering all control variables other than the lag of dependent variable are shown in column 2 of table 3. Two external instruments such as the ratio of remittances to GDP for neighbour countries located in the same region for each country, and the log-weighted GDP per capita of the five top most migrants' host countries for each country have been used for the IV estimation. The results show that the coefficient of the ratio of remittances to GDP is not only statically significant, but also about 3.5 times larger than that of the OLS estimation. Unlike the OLS estimation presented in table 3, the IV estimation shows the significant and negative impact of the initial GDP per capita on consumption volatility, suggesting that initial relative income of a country is an important factor for reducing the volatility of household consumption. Like the OLS estimation presented in table 3, the coefficients for the ratio of government consumption to GDP, and the ratio of trade openness to GDP are also positive and statistically significant at the one percent level where the magnitude of the trade openness variable is larger than that of the OLS estimation. In addition, the output growth volatility and the government investment volatility are also positively and significantly associated with the volatility of consumption. As well as this, the ratio of bank credit to GDP also reveals the negative impact on consumption volatility while the size of the coefficient is considerably larger as obtained from the OLS estimation. Among all control variables, the ratio of aid flows to GDP, and the financial openness have not shown any significant impact on the volatility of consumption. Although the IV estimation certainly captures the biases caused by the measurement error, it does not address the problem of reverse causality (Aggarwal, et al., 2011).

The last column of table 3 reports the results obtained using the system GMM estimation for all developing countries (including the former and present communist countries). Results reveal that the coefficient of the ratio of remittances to GDP, 0.16, is negative and highly significant at the one percent level. This finding

reinforces the stabilising impact of remittances on consumption volatility considering the potential endogeneity of remittances in developing countries. Furthermore, the size of the coefficient of the ratio of remittances to GDP is also consistent with the results obtained from the OLS and IV estimations. Among other control variables included in the system GMM estimation in table 3, the log initial GDP per capita, and the ratio of bank credit to GDP show the negative and significant impact on consumption volatility. On the other hand, the coefficients of the ratio of government consumption to GDP, the ratio of trade openness to GDP, the output growth volatility, and the government investment volatility are positive and significant in the system GMM estimation. Like the two other estimations (OLS and IV) presented in table 3, the ratio of aid flows to GDP, and the financial openness do not appear to be associated with consumption volatility in the system GMM estimation. The Hansen test confirms the validity of the instruments and the autocorrelation tests also do not reject the model due to the presence of second order serial correlation in the system GMM framework.

Table 4 presents the empirical results obtained from different estimators while the influences of the former and present communist countries on consumption have been excluded. In the first column, the results from the OLS estimation show the significant and negative impact of the ratio of remittances to GDP on the volatility of consumption considering the effects of other control variables as fixed. In addition, the magnitude of the coefficient of the ratio of remittances to GDP (0.09) is almost similar to that estimated without considering the influences of all communist countries on consumption. Among all control variables included in the OLS estimation in table 4, the coefficients for the ratio of government consumption to GDP, the ratio of trade openness to GDP, output growth volatility, and the government investment volatility, are positive and statistically significant. Additionally, the ratio of available bank credit to GDP is also statistically significant at the 5 percent level with the expected sign. Other control variables such as the log of initial GDP per capita, the ratio of aid flows to GDP, and the financial openness variables do not have any significant impact on consumption volatility.

[Table 4 is about here]

The empirical results obtained from the IV estimation while excluding the influences of former and present communist countries presented in table 4 also confirm the negative association between the ratio of remittances to GDP and the consumption volatility. Moreover, the size of the coefficient for the remittance variable is 0.64, which is about two times larger than that obtained considering the influences of all former and present communist countries on consumption. In addition, the magnitude of this coefficient is about six times larger than that of the OLS estimation as shown in table 4. The coefficients for all control variables other than the ratio of aid flow to GDP, and financial openness are also statistically significant in the IV estimation.

The last column of table 4 reports the system GMM estimation results while the influences of former and present communist countries have not been considered. Results show that the coefficient for the ratio of remittances to the GDP variable is negative and statistically significant at the one percent level. This result also reinforces the finding obtained from the OLS and IV estimations. The magnitude of the coefficient for the remittances variable is 0.22, which shows a stronger stabilising impact of remittances on the volatility of consumption. Although the size of the remittance coefficient is about 2.2 times larger than that of the OLS estimation, it is about 2.8 times smaller than the result obtained from the IV estimation presented in table 4. As well as this, the coefficient for the ratio of bank credit to GDP, is negative and significant. Among other control variables, the ratio of trade openness to GDP, the output growth volatility, and the government investment volatility are found to be positively and significantly associated with the volatility of consumption whereas the initial GDP per capita is significantly and negatively associated with the household consumption volatility. The diagnostic tests for the system GMM estimation presented in table 4 also confirm the validity of the instrumentation in the system GMM framework.

5.2 Robustness checks

Since financial development of a country has been considered as an important determinant of consumption smoothing, two alternatives of financial development

have been used to reexamine the stabilising contribution of remittances to the volatility of household consumption based on the financial development.

[Table 5 is about here]

The ratio of bank deposits to GDP, and the ratio of broad money to GDP (M2/GDP) instead of the ratio of bank credit to GDP have been used as the proxy variable for financial development in table 5. After controlling for the ratio of bank deposit to GDP along with other control variables in table 5, the results in column 1 and column 3 show the highly significant and negative association of international remittances with consumption volatility in developing countries. Moreover, the size of the coefficient for the remittances variable in column 3 is 0.24, which is larger than that of column 1 (0.16), where the influences of former and present communist countries have not been excluded. Likewise, the broad money to GDP (M2/GDP) ratio has been used as an alternative measurement of financial development in column 2 and column 4. The findings also reinforce the stabilising impact of international remittances on the volatility of household consumption following the same trend as other measures of financial development in developing countries.

[Table 6 is about here]

The results of robustness checks after controlling for fewer variables for all developing countries including former and present communist countries have been reported in table 6. At the beginning, this study has controlled for the lag of consumption volatility, and log of initial GDP per capita in column 1. The ratio of government consumption to GDP and the ratio of trade openness to GDP are used as additional control variables in column 2 and column 3 respectively. Although the results obtained still suggest the significant stabilising impact of international remittances on the volatility of household consumption, the diagnostic tests fails to confirm the validity of instrumentation in the system-GMM framework. The diagnostic tests confirm the validity of the instrumentation, with a negative and

significant impact of remittances on consumption volatility, while the output growth volatility is introduced as an additional control variable in column 4. Although the government investment volatility is not significant while it is introduced as another additional control variable in column 5, this variable is significantly associated with the consumption volatility while the ratio of bank credit to GDP variable is used in column 6. Moreover this negative and significant relation between remittances and consumption volatility has not changed even when the government investment volatility, the ratio of bank credit to GDP, the ratio of aid flow to GDP, and the financial openness variables have been used as additional control variables in the regressions from column 5 to column 8.

[Table 7 is about here]

Table 7 presents the results for robustness checks controlling for fewer variables using the system GMM estimation while the influences of former and present communist countries have been excluded from the sample. The diagnostic tests confirm the validity of the instrumentation in the SYS GMM framework in all the regressions except in column 1 (column 2 to column 4). The ratio of international remittance to GDP significantly contributes to stabilising the volatility of consumption while the government consumption to GDP variable is introduced as an additional control variable in column 2. The findings of other columns also reinforce the significant and negative impact of international remittances on the volatility of household consumption, regardless of which control variables are introduced one by one across all columns in table 7. Moreover, the magnitude of the coefficient for the ratio of remittances to GDP is found to be stronger compared to the results presented in table 6 following the same order to control additional variables from column 1 to column 8.

5.3 Discussion

International remittances can be used for the consumption of durable goods as well as non-durable consumption of goods which both help to smooth the consumption growth of remittance receiving households. Nevertheless, international remittances can also play a role as insurance for smoothing the consumption during a

period of various negative income shocks in the country. Therefore, international remittances can indeed play a significant role in stabilising the volatility of household consumption in developing countries. These results are consistent with the findings of Bettin, et al. (2014); Combes & Ebeke (2011) and Chami, et al. (2009).

Furthermore, the consumption volatility may be amplified due to an increase in trade openness and the size of the government. In contrast, the volatility of consumption is lower in more developed countries since the initial GDP per capita is negatively associated with consumption volatility. These results are consistent with the findings of early studies (Bekaert et al., 2006; Herrera & Vincent, 2008; Chami et al., 2009). In addition, this study also suggests that a country with more volatile output growth will face more volatile growth in household consumption. Similarly, less volatile government investment in various fixed capital formation such as land improvements (construction of drains, fences, ditches, etc.), construction of roads, highways, markets, schools, hospitals, and so forth, is associated with the less volatile consumption. While smooth growth of government investment in fixed capital formation facilitates household consumption from the country specific side, international remittances could directly contribute to stabilising the volatility of consumption by increasing the purchasing power of remittance receiving households. Although this finding suggests that consumption smoothing could depend on the level of financial development of a country, the magnitude for consumption smoothing is much lower than that of international remittances. Nevertheless, the robustness checks confirm the stabilising impact of international remittances on the volatility of household consumption regardless of the controls or measurement of financial development used in this study. Additionally, the finding confirms the bias in the measurement of the impact of remittances on consumption volatility due to the difference in public goods distribution systems between the communist and non-communist developing countries. However, the overall findings of this study have established a significant and robust relationship between international remittances and the consumption volatilities of developing countries.

6. Conclusions

Although the impact of international remittances has increasingly been recognised, its contribution in reducing the volatility of household consumption has not been studied thoroughly. A better understanding of the impact of remittances on the consumption volatility is important, since household consumption is considered an integral part of household welfare. Using the panel data of 84 developing countries for the period 1978 to 2012, this study investigates the role of international migrants' remittances as a source of external finance that may help in reducing the macroeconomic volatility of household consumption in developing countries.

However, this study provides evidence that remittance flows indeed contribute significantly to reducing the volatility of household consumption in developing countries, even after controlling for a number of country specific potential determinants of consumption volatility. In addition, the magnitude of the stabilising impact of remittances on consumption volatility is stronger, while the influences of former and present communist countries are excluded from the sample. Hence, the negative relationship between remittances and the consumption volatility is reinforced, even when considering the possible bias due to the difference in the public goods distribution systems of the communist and non-communist developing countries. This result is robust, considering the biases arising from omitted variables, reverse causation and measurement error.

Even though excess dependence by the remittance receiving country on the international remittance flow, as an external source of finance, may lead to an increase in macroeconomic vulnerability to exogenous shocks, this issue has not been considered in this study. Further research on the link between remittances and the vulnerability to external shocks in developing countries is warranted. However, the main findings of this study reveal that the stabilising impact of remittances on consumption volatility is appreciably acceptable, as the remittance flow is found to be more stable compared to other capital flows that act as external sources of capital in developing countries such as FDI, ODA, and private debt and portfolio equity, even during and after the global economy had been affected by the global financial crisis in 2009. The findings of this study, therefore, highlight that international migrants'

remittances may indeed contribute significantly to households' welfare through reducing the volatility of consumption in remittance receiving developing countries.

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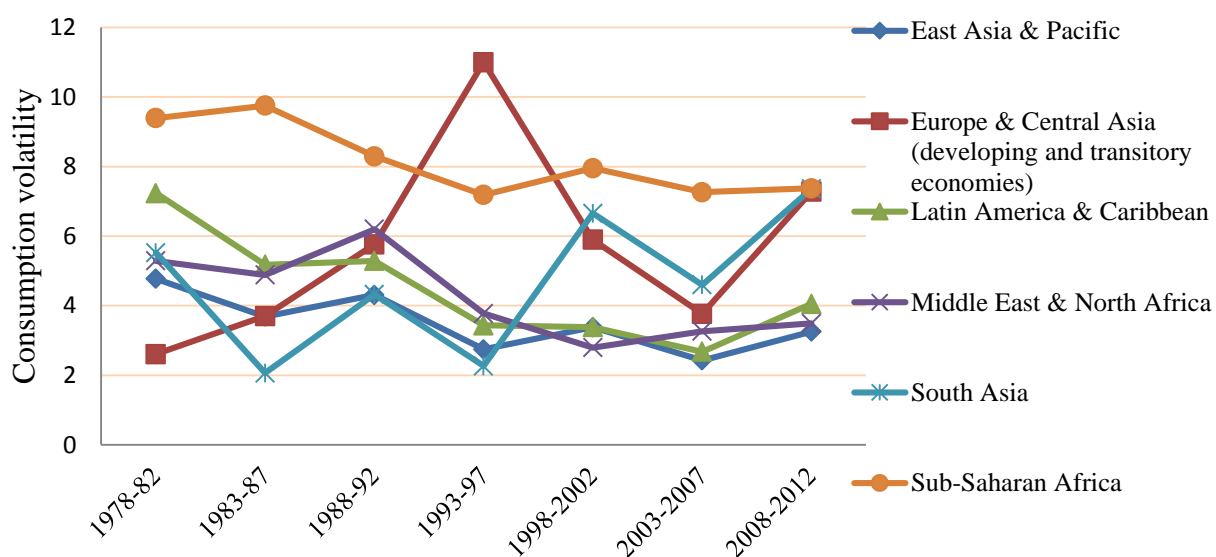
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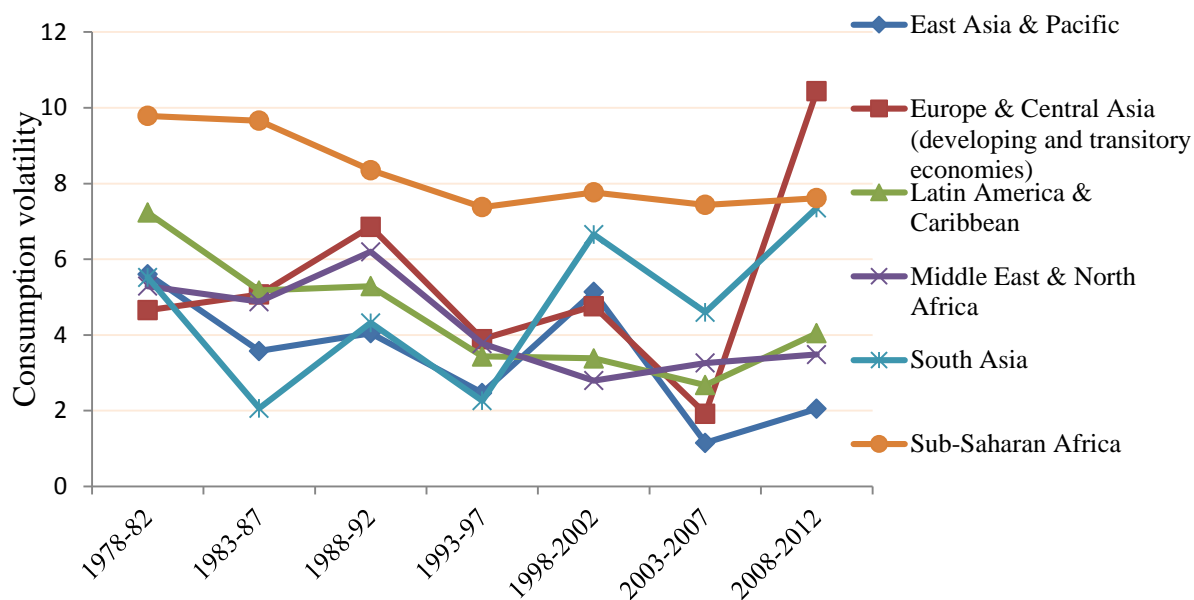
Figures

Fig. 1(a) Regional trend of consumption volatility in all developing countries (including former and present communist countries)



Source: Calculated by the authors using the World Bank Development Indicator, 2014.

Fig. 1(b) Regional trend of consumption volatility in all developing countries (excluding former and present communist countries).



Source: Calculated by the authors using the World Bank Development Indicator, 2014.

Table 1: Variable definitions and sources

Variable	Definition	Sources
σ	Standard deviation of household consumption per capita growth (Consumption volatility), estimated over non-overlapping 5-year periods.	World Development Indicator, 2014
R	Sum of remittances, migrants transfers and workers compensation as a ratio to GDP	World Development Indicator, 2014
$IniGDP$	Logarithm of initial GDP per capita at the beginning of each period at constant 2005 US\$	World Development Indicator, 2014
Gov_con	The ratio of total government consumption expenditure to GDP	World Development Indicator, 2014
$Trade_open$	Sum of exports and imports measured as a ratio to GDP.	World Development Indicator, 2014
$GDP_volatility$	Standard deviation of GDP per capita growth estimated over non-overlapping 5-year periods.	World Development Indicator, 2014
$Inv_volatility$	Standard deviation of government fixed investment growth (annual) estimated over non-overlapping 5-year periods	World Development Indicator, 2014
$Bank_credit$	The ratio of private credit provided by deposit money banks to GDP	Global Financial Development , 2014
Aid	The ratio of official development aid (ODA) and other official aid to GDP	World Development Indicator, 2014
$Finan_open$	Chinn-Ito Index (KAOPEN)	web.pdx.edu/~ito/Chinn-Ito_website.htm
$M2 / GDP$	The ratio of broad money to GDP	World Development Indicator, 2014
Bank Deposit / GDP	The ratio of deposits by deposit money banks to GDP	Global Financial Development, 2014
GDP per capita of migrants' host country	GDP per capita of five top most migrants' host countries, weighted by the share of migrants of the remittance receiving countries.	Bilateral Migration Matrix of the world Bank

Table 2: Summary statistics of different variables in all developing countries

Variable	Obs.	Mean	Std. Dev.	Min	Max
SD of household consumption per capita growth	479	0.05956	0.05472	0.00031	0.33299
Log of initial GDP per capita	531	7.13008	1.07286	4.82365	9.56607
Ratio of Govt. consumption to GDP	541	0.14809	0.06087	0.02804	0.46303
Ratio of trade openness to GDP	543	0.71646	0.37066	0.12855	2.10038
SD of GDP per capita growth	546	0.03586	0.03273	0.00278	0.34799
SD of Govt. investment growth	476	0.13088	0.09967	0.00343	0.74025
Ratio of bank credit to GDP	481	0.24976	0.20990	0.00381	1.33613
Ratio of bank deposit to GDP	478	0.27691	0.19140	0.02928	1.16618
Ratio of M2 to GDP	527	0.39652	0.28234	0.07723	2.39187
Ratio aid flow to GDP	527	0.06228	0.07636	0.00011	0.49735
Financial openness	530	1.66120	1.32092	0.12498	4.42176
Ratio of Remittances to GDP	472	0.04138	0.07840	0.00017	0.76171

Note: "SD" refers to the Standard Deviation.

Table 3: The impacts of international remittances on household consumption in developing countries (including former and present communist countries). Dependent variable: Standard deviation (SD) of household consumption per capita growth.

Independent variables	OLS	IV	SYS GMM
<i>Lag</i> of dependent variable			0.070 (0.081)
Log of initial GDP per capita	-0.032 (0.030)	-0.052* (0.029)	-0.047** (0.022)
Ratio of Gov. consumption to GDP	0.160** (0.076)	0.239*** (0.076)	0.226*** (0.084)
Ratio of trade openness to GDP	0.034*** (0.010)	0.071*** (0.025)	0.028** (0.011)
SD of GDP per capita growth	0.430*** (0.137)	0.423*** (0.102)	0.449*** (0.150)
SD of Gov. investment growth	0.077*** (0.029)	0.065** (0.027)	0.081** (0.036)
Ratio of bank credit to GDP	-0.028*** (0.010)	-0.043** (0.018)	-0.024* (0.012)
Ratio of aid flow to GDP	-0.022 (0.067)	-0.082 (0.072)	-0.073 (0.102)
Financial openness	0.001 (0.002)	0.004 (0.003)	0.001 (0.002)
Ratio of remittances to GDP	-0.096*** (0.024)	-0.345*** (0.087)	-0.162*** (0.052)
Constant	0.032 (0.033)	0.124 (0.065)	0.043 (0.050)
Observations	385	385	340
Countries	83	83	83
R squared	0.433	0.218	
AR(1) p-value			0.000
AR(2) p-value			0.499
Hansen p-value			0.560
Instruments			26

Notes: The estimation method is one step System GMM and time effects are included in all the regressions. Robust standard errors are in parentheses. “***”, “**” and “*” denote significant at 1% level, 5 % level and 10 % level respectively.

Table 4: The impacts of remittances on household consumption in developing countries (Excluding former and present communist countries). Dependent variable: Standard deviation (SD) of household consumption per capita growth

	OLS	IV	SYS GMM
<hr/>			
Independent variables			
<hr/>			
Lag of dependent variable			0.074 (0.107)
Log of initial GDP per capita	-0.029 (0.030)	-0.062** (0.027)	-0.048** (0.022)
Ratio of Gov. consumption to GDP	0.161* (0.096)	0.277*** (0.061)	0.266** (0.102)
Ratio of trade openness to GDP	0.036*** (0.012)	0.064*** (0.012)	0.038** (0.016)
SD of GDP per capita growth	0.382** (0.153)	0.530*** (0.104)	0.444** (0.168)
SD of Gov. investment growth	0.073** (0.033)	0.087*** (0.025)	0.071* (0.041)
Ratio of bank credit to GDP	-0.030** (0.013)	-0.069*** (0.015)	-0.033* (0.018)
Ratio of aid flow to GDP	-0.020 (0.089)	-0.137** (0.067)	-0.105 (0.135)
Financial openness	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)
Ratio of remittances to GDP	-0.092*** (0.024)	-0.640* (0.326)	-0.218*** (0.072)
Constant	0.031 (0.037)	0.070 (0.031)	0.056 (0.060)
Observations	318	318	279
Countries	64	64	64
R squared	0.405	0.377	
AR(1) p-value			0.000
AR(2) p-value			0.216
Hansen p-value			0.509
Instruments			26

Notes: The estimation method is one step System GMM and time effects are included in all the regressions. Robust standard errors are in parentheses. “***”, “**” and “*” denote *significant at 1% level, 5 % level and 10 % level respectively.*

Table 5: Robustness checks using alternatives of financial development in developing countries. Dependent variable: Standard deviation (SD) of household consumption per capita growth

Independent variables	Including former and present communist countries		Excluding former and present communist countries	
	(1)	(2)	(3)	(4)
Lag of dependent variable	0.069 (0.080)	0.072 (0.082)	0.067 (0.106)	0.095 (0.110)
Log of initial GDP per capita	-0.058** (0.030)	-0.043** (0.019)	-0.067** (0.033)	-0.049** (0.024)
Ratio of Gov. consumption to GDP	0.238*** (0.089)	0.230** (0.089)	0.297*** (0.112)	0.270** (0.106)
Ratio of trade openness to GDP	0.028** (0.011)	0.027** (0.012)	0.040** (0.016)	0.031* (0.016)
SD of GDP per capita growth	0.452*** (0.149)	0.448*** (0.150)	0.440*** (0.163)	0.437** (0.169)
SD of Gov. investment growth	0.076** (0.037)	0.080** (0.037)	0.074* (0.041)	0.075* (0.042)
Ratio of aid flow to GDP	-0.068 (0.101)	-0.069 (0.101)	-0.129 (0.140)	-0.096 (0.136)
Financial openness	0.001 (0.002)	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)
Ratio of bank deposits to GDP	-0.026* (0.015)		-0.036* (0.021)	
Ratio of M2 to GDP		-0.022* (0.012)		-0.025* (0.014)
Ratio of remittances to GDP	-0.156*** (0.048)	-0.150*** (0.051)	-0.238*** (0.082)	-0.187*** (0.061)
Constant	0.021 (0.048)	0.043 (0.049)	0.066 (0.063)	0.051 (0.058)
Observations	340	340	278	279
Countries	82	83	63	64
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.481	0.467	0.222	0.210
Hansen p-value	0.496	0.552	0.615	0.382
Instruments	26	26	26	26

Notes: The estimation method is one step System GMM and time effects are included in all the regressions. Robust standard errors are in parentheses. “***”, “**” and “*” denote *significant at 1% level, 5 % level and 10 % level respectively.*

Table 6: Robustness checks through controlling fewer variables in developing countries (including former and present communist countries). Dependent variable: Standard deviation (SD) of household consumption per capita growth

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lag of dependent variable	0.147* (0.075)	0.109 (0.073)	0.079 (0.075)	0.070 (0.067)	0.060 (0.073)	0.052 (0.078)	0.062 (0.081)	0.070 (0.081)
Log of initial GDP per capita	-0.020 (0.043)	-0.057 (0.036)	-0.059* (0.033)	-0.061** (0.030)	-0.058** (0.027)	-0.040** (0.019)	-0.048** (0.022)	-0.047** (0.022)
Ratio of Gov. consumption to GDP		0.269*** (0.076)	0.228*** (0.078)	0.209*** (0.071)	0.215*** (0.078)	0.196*** (0.072)	0.218*** (0.081)	0.226*** (0.084)
Ratio of trade openness to GDP			0.031*** (0.010)	0.027*** (0.009)	0.025*** (0.009)	0.027** (0.010)	0.029** (0.011)	0.028** (0.011)
SD of GDP per capita growth				0.616*** (0.164)	0.608*** (0.171)	0.433** (0.184)	0.451*** (0.151)	0.449*** (0.150)
SD of Gov. investment growth					0.002 (0.002)	0.076** (0.036)	0.082** (0.036)	0.081** (0.036)
Ratio of bank credit to GDP						-0.023** (0.011)	-0.025** (0.012)	-0.024* (0.012)
Ratio of aid flow to GDP							-0.072 (0.101)	-0.073 (0.102)
Financial openness								0.001 (0.002)
Ratio of remittances to GDP	-0.072* (0.039)	-0.130*** (0.039)	-0.175*** (0.042)	-0.148*** (0.038)	-0.141*** (0.036)	-0.149*** (0.046)	-0.155*** (0.051)	-0.162*** (0.052)
Constant	0.075 (0.034)	0.044 (0.031)	0.055 (0.030)	0.031 (0.026)	0.034 (0.026)	0.025 (0.029)	0.029 (0.047)	0.043 (0.050)
Observations	382	381	381	381	373	348	341	340
Countries	84	84	84	84	83	83	83	83
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.619	0.605	0.633	0.475	0.908	0.472	0.331	0.499
Hansen p-value	0.021	0.100	0.108	0.559	0.543	0.565	0.551	0.560
Instruments	19	20	21	22	23	24	25	26

Notes: The estimation method is one step System GMM and time effects are included in all the regressions. Robust standard errors are in parentheses. “***”, “**” and “*” denote significant at 1% level, 5 % level and 10 % level respectively.

Table 7: Robustness checks through controlling fewer variables in developing countries (excluding former and present communist countries). Dependent variable: Standard deviation (SD) of household consumption per capita growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Independent variables								
Lag of dependent variable	0.188** (0.086)	0.113 (0.089)	0.082 (0.091)	0.067 (0.083)	0.055 (0.092)	0.045 (0.102)	0.063 (0.108)	0.074 (0.107)
Log of initial GDP per capita	-0.012 (0.049)	-0.052 (0.033)	-0.062** (0.030)	-0.056** (0.028)	-0.058** (0.029)	-0.047* (0.025)	-0.049** (0.021)	-0.048** (0.022)
Ratio of Gov. consumption to GDP		0.318*** (0.080)	0.253*** (0.084)	0.242*** (0.079)	0.252*** (0.089)	0.230*** (0.083)	0.257** (0.099)	0.266** (0.102)
Ratio of trade openness to GDP			0.040*** (0.013)	0.034*** (0.012)	0.031** (0.012)	0.036** (0.014)	0.038** (0.015)	0.038** (0.016)
SD of GDP per capita growth				0.564*** (0.185)	0.556*** (0.195)	0.399* (0.216)	0.447*** (0.168)	0.444** (0.168)
SD of Gov. investment growth					0.002 (0.002)	0.067* (0.039)	0.073* (0.040)	0.071* (0.041)
Ratio of bank credit to GDP						-0.030* (0.016)	-0.034* (0.018)	-0.033* (0.018)
Ratio of aid flow to GDP							-0.103 (0.135)	-0.105 (0.135)
Financial openness								0.001 (0.002)
Ratio of remittances to GDP	-0.107 (0.059)	-0.206*** (0.060)	-0.258*** (0.069)	-0.212*** (0.060)	-0.203*** (0.056)	-0.207*** (0.062)	-0.212*** (0.071)	-0.218*** (0.072)
Constant	0.063 (0.039)	0.035 (0.036)	0.054 (0.035)	0.032 (0.031)	0.033 (0.032)	0.027 (0.035)	0.056 (0.060)	0.056 (0.060)
Observations	313	312	312	312	304	283	280	279
Countries	65	65	65	65	64	64	64	64
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.360	0.286	0.274	0.317	0.608	0.283	0.117	0.216
Hansen p-value	0.050	0.267	0.286	0.518	0.547	0.539	0.508	0.509
Instruments	19	20	21	22	23	24	25	26

Notes: The estimation method is one step System GMM and time effects are included in all the regressions. Robust standard errors are in parentheses. “***”, “**” and “*” denote significant at 1% level, 5 % level and 10 % level respectively.

Appendix 1: List of developing countries

Country	Country	Country	Country
Algeria	Ecuador	Mali	Seychelles
Argentina	Egypt, Arab Rep.	Mauritania	Sierra Leone
Armenia ^C	El Salvador	Mauritius	South Africa
Azerbaijan ^C	Gabon	Mexico	Sri Lanka
Bangladesh	Gambia, The	Moldova ^C	Sudan
Belarus ^C	Guatemala	Mongolia ^C	Swaziland
Belize	Honduras	Morocco	Tajikistan ^C
Benin	Hungary ^C	Mozambique ^C	Tanzania
Bhutan	India	Namibia	Thailand
Bolivia	Indonesia	Nepal	Togo
Botswana	Iran, Islamic Rep.	Nicaragua	Tunisia
Brazil	Jordan	Nigeria	Turkey
Bulgaria ^C	Kazakhstan ^C	Oman	Uganda
Burkina Faso	Kenya	Pakistan	Ukraine ^C
Cambodia ^C	Kyrgyz Republic ^C	Panama	Uruguay
Cameroon	Lao PDR ^{C*}	Paraguay	Venezuela, RB
China ^{C*}	Lebanon	Peru	Vietnam ^{C*}
Colombia	Lesotho	Philippines	Zambia
Comoros	Macedonia, FYR ^C	Romania ^C	
Congo, Rep.	Madagascar	Russian Federation ^C	
Costa Rica	Malawi	Rwanda	
Dominican Republic	Malaysia	Senegal	

Note: “c” denotes the communist countries, and “c*” denotes the present communist countries.

Appendix 2: The Hausman test for fixed effect OLS estimation in all developing countries (including former and present communist countries. Dependent variable: Standard deviation of household consumption per capita growth

	---- Coefficients ----			sqrt(diag(V_b-V_B)) S.E.
	(b) Fixed	(B) Random	(b-B) Difference	
<i>IniGDP</i>	-0.030453	-0.013264	-0.017189	0.008659
<i>Gov_con</i>	0.192606	0.242563	-0.049956	0.047167
<i>Trade_open</i>	0.024824	0.041069	-0.016244	0.009696
<i>GDP_volatility</i>	0.493835	0.533700	-0.039866	0.032580
<i>Inv_volatility</i>	0.075356	0.098463	-0.023107	0.009391
<i>Babk_credit</i>	-0.024870	-0.067558	0.042689	0.014323
<i>Aid</i>	-0.014582	0.041583	-0.056165	0.039977
<i>Finan_open</i>	0.000834	0.002054	-0.001220	0.001230
<i>R</i>	-0.088997	-0.142794	0.053797	0.038726

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(8) &= (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) \\ &= 41.09 \\ \text{Prob}>\text{chi2} &= 0.0000 \end{aligned}$$

Notes: Time effects are not included in the regressions because the Hausman test cannot be performed while time and time invariant variables are included in the model. (Wooldridge, 2010; Aggarwal, et al., 2011)

Appendix 3: The Hausman test for fixed effect OLS estimation for developing countries (excluding former and present communist countries). Dependent variable: Standard deviation (SD) of household consumption per capita growth

	---- Coefficients ----			sqrt(diag(V_b-V_B)) S.E.
	(b) Fixed	(B) Random	(b-B) Difference	
<i>IniGDP</i>	-0.031354	-0.009736	-0.021618	0.012128
<i>Gov_con</i>	0.199197	0.214586	-0.015389	0.054214
<i>Trade_open</i>	0.028916	0.051176	-0.022261	0.011391
<i>GDP_volatility</i>	0.460646	0.500553	-0.039907	0.041709
<i>Inv_volatility</i>	0.069864	0.091124	-0.021259	0.010903
<i>Babk_credit</i>	-0.030832	-0.081934	0.051102	0.015994
<i>Aid</i>	-0.017999	0.058614	-0.076613	0.049130
<i>Finan_open</i>	0.001517	0.002980	-0.001463	0.001404
<i>R</i>	-0.087984	-0.205434	0.117450	0.050015

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(8) &= (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) \\ &= 38.09 \\ \text{Prob}>\text{chi2} &= 0.0000 \end{aligned}$$

Notes: Time effects are not included in the regressions because the Hausman test cannot be performed while time and time invariant variables are included in the model (Wooldridge, 2010; Aggarwal, et al. 2011).

Appendix 4: Impact of remittances on consumption volatility (two way fixed effect OLS estimations including county and time fixed effects). Dependent variable: Standard deviation (SD) of household consumption per capita growth

Independent variables	Including former and present communist countries	Excluding former and present communist countries
Log of initial GDP per capita	-0.032 (0.030)	-0.029 (0.030)
Ratio of Gov. consumption to GDP	0.160** (0.076)	0.161* (0.096)
Ratio of trade openness to GDP	0.034*** (0.010)	0.036*** (0.012)
SD of GDP per capita growth	0.430*** (0.137)	0.382** (0.153)
SD of Gov. investment growth	0.077*** (0.029)	0.073** (0.033)
Ratio of bank credit to GDP	-0.028*** (0.010)	-0.030** (0.013)
Ratio of aid flow to GDP	-0.022 (0.067)	-0.020 (0.089)
Financial openness	0.001 (0.002)	0.002 (0.002)
Ratio of remittances to GDP	-0.096*** (0.024)	-0.092*** (0.024)
Constant	0.032 (0.033)	0.031 (0.037)
Observations	385	318
Countries	83	64
R squared	0.433	0.405
F statistic for time fixed effect	2.67	3.63
p-value	0.020	0.003

Word Count: 5891 (excluding Tables, Figures, References & Appendix)