

ASSESSING THRESHOLDS OF REMITTANCES- INDUCED GROWTH: A MACRO-DYNAMIC ANALYSIS

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ABSTRACT

I examined the remittances-induced growth threshold constraints effect to circumvent the risk that related-policies adversely affect receiving countries and households. I built and tested a macro dynamic model using Panel Least Square and GMM estimations on a 36 countries panel data for the period 1980-2013, obtained from the World Development Indicators and Poverty and Equity databases and the International Financial Statistics. I further, pooled the data to derive thresholds values of growth induced by remittance flows to 24 countries' economies, agriculture sectors, and industry sectors respectively. The empirical results reveal that a country's ability to reap remittances-induced growth is most effectively captured using its own individual threshold as criteria than a group's threshold. The transmission of the impact is a long-term process, independently determined between an economy and its sectors. Transitory effects generated by remittance flows are more sensitive to fluctuations in consumption, investments, and wages than mutations in financial sectors, a sign that financial development is not inherent to the remittances-growth relation. Globally, these findings suggest that failures to accommodate transitory effects with appropriate measures and/or deviations of remitted resources to non-households' uses, at pre-threshold phases, will necessarily curtail the growth-generating and poverty-reduction powers of remittances.

Key words: remittances, growth, thresholds, financial sector, transitory effects, phases.

JEL Codes : E61, F24, O40

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I. INTRODUCTION

Economists have been analyzing various aspects of the impact remittances exert on growth but, with very few exceptions [Giuliano & Ruiz-Arranz (2009)], tend to overlook its threshold constraint effect. Receiving countries have also been disregarding this aspect in their remittances-related policies and projects. They have been expanding their financial service networks to increase future remittance inflows, used, in most cases, to back governments' borrowings on international securities markets [Osili (2007), Gupta & all (2009)] disregarding possible damaging effects. Drawbacks of remittances cited in the literature include, among others, the impediment of receiving countries' monetary policy making [Barajas & all (2016)] and the undermining of their capacities to cope with crises [Sayan (2006).] Ignoring the remittances induced-growth thresholds constraint effect, bears the risk of limiting their growth enhancing power and adversely affecting receiving households. It, thus, draws a research interest and motivated this paper to study their induced growth threshold constraint effect on countries.

For that purpose, I estimated values of remittances-induced growth thresholds and determined their impact on receiving countries' capacities to reap it. I built and tested a macro dynamic model using Panel Least Square and GMM estimations on a 36 countries panel data for the period 1980-2013. I further, pooled the data to derive values of remittances-induced growth thresholds for 24 countries' economies, agriculture sectors, and industry sectors respectively. Empirical results reveal that the transmission of remittances' impact on growth to be a long-term process better assessed using a country's own individual threshold than a group's threshold. Besides, it is independently determined between an economy and its sectors. Globally, the findings call for remittances-related policies to account for their threshold constraint effect and avoid deviating remitted resources to non-households' uses, at pre-threshold phases.

The rest of the paper is organized in five subsequent sections. Section II clarifies its objectives, Section III reviews the literature, Section IV sets the theoretical model, Section V presents the empirical analysis, and Section VI discusses findings and concludes.

II. OBJECTIVES

The main objective of this paper is to examine the remittances-induced growth threshold constraint effect on receiving countries. The underlying problem is the potential risk that ignoring policies may limit remittances growth enhancing effect and adversely lead receiving households into a permanent dependency. Specifically, this paper set to determine the process through which the impact remittances exert on growth is transmitted and its various stages. It will, then, estimate values of threshold points from which remittances-induced growth triggered in 36 receiving countries over the period 1980-2013.

III. LITERATURE REVIEW

Economists have been investigating the remittances-growth relation using microeconomic and/or macroeconomic analytical approaches. While testing remittances' influence on receiving households' welfare, most micro approach studies found them to be counter-cyclical to output as they serve primarily altruistic purposes. They serve to finance family members' purchases of living necessities [Barajas & all (2009)] and act as a social insurance. They help dampen the effect of consumption instability [Agarwal & Horowitz (2002), Osili (2007), Bettin & all (2015)], reduce income disparities [Ebeke & all (2014)], improve labor participation [Edwards & Ureta (2003)], and increase access to social services [Cox & Ureta (2003), Dean Yang (2008).] As a result, they increase the likelihoods for receiving households to move out of poverty as proved by Gupta & all (2009) that a 10 percent rise in remittance inflows brings about a 1 percent fall in headcount poverty and the poverty gap. Yet, while accounting for shares of remittances used on human capital formation and physical capital accumulation, other micro approach studies [Cooray & Mallick (2013), Bettin & all (2011), and Hanson & Woodruff (2003)] found remittances to be also, or rather, investment-motivated and pro-cyclical with output. Specifically, Sayan (2006) compared correlations between trends in real GDP and trends in real remittances received in 12 countries and concluded that remittances were counter-cyclical in some of the countries but pro-cyclical in the others. Giuliano & Ruiz-Arranz (2009) found that remittances tend to respond to investment opportunities at least as much as to altruistic or insurance motives. More importantly, Adams Jr. & Cuecuecha (2010) found that receiving households, surveyed in Guatemala,

were motivated to spend more on investment goods at the margin than on food items. These households would have spent 194% more at margin on education, 81% more on housing, but 18% less on food without the receipt of international remittances. Barajas & all (2009) even concluded that remittances exert, in some aspects, similar effects on economic growth as FDI and other private international capital flows.

Macro approach studies explored macroeconomic implications of the remittances-growth relation by testing the influence remittances exert on various macroeconomic variables [Jansen & all (2012), Faini (1994)] including, among others, exchange rate [Lartey & all (2012), Yang (2008)], public finance [Abdih & all (2012)], and business cycle [Jihoud (2015).] Findings that remittances induce poverty reduction through financial development and the induced financial literacy hypothesis [Brown & all (2011)] raised a research interest in the trilateral remittances-financial development-growth relations. Even the bilateral remittances-financial development relation has been studied, with mixed results, either directly [Gupta & all (2009), Aggarwal & all (2010)] or channeled through investments [Adams Jr. & Cuecuecha (2010)], bank credit [Ebeke & all (2014)], interest rate differential [El-Sakka & McNabb (1999)], financial inclusion [Anzoátegui & all (2014)], and financial liberalization [Bang & all (2015).]

Both groups of studies, with a few exceptions, overlooked the fact that the remittances-growth relation may be constrained by a threshold effect. Barajas & all (2009) acknowledged it while Combes & Ebeke (2011) determined a threshold level of remittances beyond which macroeconomic instability increases. They found that remittances dampen significantly the effects of GDP instability on consumption instability at a threshold level of 20% of GDP. Yet, the need to anticipate the actual threshold point from which a remittances-induced growth triggers or becomes effective emerges and is the focus of this paper. For, I developed a theoretical model on the main assumptions that remittances impact growth in a dynamic process. One portion of the impact is transmitted directly (direct impact) to output and the other one indirectly (indirect impact) as also suggested by Rao & Hassan (2009). The direct impact results from short term increases in output due to increases in receiving households' consumption expenditures. The indirect impact is generated by remittances spent on human capital formation and physical capital accumulation but exerts a medium to long term multiplicative effect on output through returns on investments. The underlying justification is that, largest shares of first migrants' remittances primarily help finance households' consumption. But with time, as their

family financial burden lessens, they transfer the freed resources from altruistic purpose to investment purpose, expanding the indirect impact. Before transmuting into growth, the indirect impact cumulates as a transitional effect on output with effects of changes in households' income, consumption, and investments, in a process conditioned by a threshold effect. During that process, the induced growth escalates, given favorable socioeconomic conditions.

IV. DATA AND METHODOLOGY

The model is based on the main assumption that remittances affect growth in a dynamic process through a direct and an indirect impact on output. The indirect impact cumulates overtime as a transitional effect with other effects generated by households' income, consumption, and investments. Thus, the relationship between remittances and output is set as:

$$Y_{i,t} = Y_{i,t}(R_{i,t-j}, C_{i,t-j}, W_{i,t-j}, I_{i,t-j}, X') \quad (1)$$

Y is output, R is 'remittance flows', C is households' consumption, W is households' income, I is households' investments, and X' is a set of exogenously determined control variables. Assuming a linear functional form, Y is determined at time t as:

$$Y_{i,t} = \alpha_0 + \alpha_1 R_{i,t-j} + \alpha_2 C_{i,t-j} + \alpha_3 W_{i,t-j} + \alpha_4 I_{i,t-j} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (2)$$

μ is a time specific factor, η an observed country specific fixed effect, and ε the error term. Taking the first difference of Equations (2) and making some transformations lead to:

$$\Delta Y_{i,t} = \varphi_0 + \varphi_1 \Delta R_{i,t} + \varphi_2 [(W_{i,t-1} - R_{i,t-1}) - (I_{i,t-1} - C_{i,t-1})] + \varphi_3 \Delta R_{i,t-2} + \varepsilon_{i,t} \quad (3)$$

$\Delta Y_{i,t}$ captures the short-term change in output, $\Delta R_{i,t}$ the short-term change in remittance flows, and $\Delta R_{i,t-2}$ the long-term change in remittance flows which equals $R_{i,t-2}$ at the initial stage. The term $[(W_{t-1}-R_{t-1})-(I_{t-1}-C_{t-1})]$ captures the short-term disequilibrium relationship between remittances and households' income, investments, and consumption expenditures. It reflects their total transitory effects on output and can be expressed as:

$$T_{i,t-1} = (W_{i,t-1} - R_{i,t-1}) - (C_{i,t-1} - I_{i,t-1}) \quad (4)$$

Variables R , W , C , and I are determined in autoregressive processes as:

$$W_{i,t-1} = a_0 + a_1 W_{i,t-2} + \varepsilon_{1i,t-1} \quad (5); \quad R_{i,t-1} = b_0 + b_1 R_{i,t-2} + \varepsilon_{2i,t-1} \quad (6)$$

$$C_{i,t-1} = c_0 + c_1 C_{i,t-2} + \varepsilon_{3i,t-1} \quad (7); \quad I_{i,t-1} = i_0 + i_1 I_{i,t-2} + \varepsilon_{4i,t-1} \quad (8)$$

Substituting Equations (5), (6), (7), and (8) into (4), making some transformations, and adding control variables lead to:

$$T_{i,t-1} = \psi_0 + \psi_1 W_{i,t-2} + \psi_2 R_{i,t-2} + \psi_3 C_{i,t-2} + \psi_4 I_{i,t-2} + \theta X'_{i,t-1} + v_{i,t} \quad (9)$$

The impact of remittances on output can be assessed with the system made of both growth and transitory effects equations (Equations 3 and 9). Equation (1) can, hence, be re-specified as:

$$Y_{i,t} = Y_{i,t}[R_{i,t-2}, T_{i,t-1}(R_{i,t-2}, C_{i,t-2}, W_{i,t-2}, I_{i,t-2}), X] \quad (1b)$$

The impact of remittances on output can be obtained by differentiating Y with respect to R as:

$$\frac{\delta Y_{i,t}}{\delta R_{i,t-2}} = \frac{dY_{i,t}}{dR_{i,t-2}} + \frac{dY_{i,t}}{dT_{i,t-1}} \cdot \frac{dT_{i,t-1}}{dR_{i,t-2}} = \varphi_{i,t-2} + (\varphi_{i,t-1} \cdot \psi_{i,t-2}) = 0 \Rightarrow (\varphi_{i,t-1} \cdot \psi_{i,t-2}) = -\varphi_{i,t-2}$$

Setting $\Phi_{i,t} = \varphi_{i,t-1} \cdot \psi_{i,t-2}$ and $\Gamma_{i,t} = -\varphi_{i,t-2}$ leads to the equilibrium relation:

$$\Phi_{i,t} = \Gamma_{i,t} \quad (10)$$

$\Gamma_{i,t}$ captures the direct impact from $(t-2)$ to t , $\Phi_{i,t}$ captures the indirect impact from $(t-2)$ to t , transmitted as transitory effects from $(t-2)$ to $(t-1)$. Growth is generated with the transmuting of the cumulated transitory effect into a sustained change in output, starting from the point where the indirect impact $\Phi_{i,t}$ outweighs the direct impact $\Gamma_{i,t}$. The value of the direct impact Γ at that exact point is the threshold value beyond which remittance flows triggers growth. On that basis, a receiving country can only be at one of the following three phases, at any given time. During the first phase ($\Phi < \Gamma$), the direct impact is strongest while the indirect one cumulates as a transitory effect. During the second phase ($\Phi \approx \Gamma$), cumulating transitory effects start to transmute into sustainable changes in output, a process that escalates under favorable socioeconomic conditions or alternatively, with effective accommodating policies. During the third phase ($\Phi > \Gamma$), transitory effects transmute into sustained changes in output. The first and second phases are pre-threshold phases and the third one the post-threshold phase.

V. EMPIRICAL RESULTS

To determine whether the nature of the remittances-induced growth in an economy is the same in its sectors, I also tested the model on targeted countries' agriculture and industry sectors. I, accordingly, redefined variable T as TRANSIT, TRANSITA and TRANSITI to capture transitory effects induced in the economies and their agriculture and industry sectors respectively. I also redefined the wage variable as WAGDP, AWAGDP, and IWAGDP proxied with aggregated, agriculture, and industry value added respectively. I generated variables TRANSFDEV, TRANSAFDEV, and TRANSIFDEV to capture the combined financial development and transitory effects in the economies, agriculture sectors, and industry sectors respectively. I defined ΔY as CGDP (change in GDP per capita), GDPG

(growth in GDP), and GDPKC (growth in GDP per capita); R as REMGDP; ΔR as CREMGDP; consumption as CONS; investment as INVEST; openness of the economy as OPEN; foreign direct investments as FDI; financial development as FDEV; and natural logarithm of GDP as LOGGDP.

A. Data descriptions and sources

I estimated the model on non-overlapping five-year averaged series, completed with the first 3 and last 3 annual values, using a 36 countries sample panel data for the period 1980-2013. I obtained the data from the World Development Indicators and Poverty and Equity databases and the International Financial Statistics. Tables 1 and 2 present the characteristics of the data.

B. Trends in remittances-generated transitory effects across countries

I computed and plotted five-year averaged values of transitory effects (TRANSITA and TRANSITI) generated in the 36 countries' agriculture and industry sectors for the period 1980-2010 (Figures 1a to 8b). Giving the assumption that stable increases in transitory effects translate into sustainable growth, I compared the trends across sectors and found industry sectors to have experienced most stable transitory effects. Across regions, Asian countries, except for Bangladesh, experienced the most stable transitory effects. The two European countries recorded increasing but very unstable transitory effects. In the Americas, Bolivia, Columbia, Guatemala, and El-Salvador experienced somewhat stable transitory effects. In the MENA region, only Egypt recorded stable transitory effects while Sub-Saharan African countries, with few exceptions, experienced very unstable transitory effects.

C. Results

C.1. Measuring the impact of remittances on growth

I estimated the transitory effects equation (Equation 9) using Panel Least Square estimation and derived the residual values of the dependent variable, which I plotted, lagged one period, with other specified variables in the growth equation (Equation 3.) I estimated the growth equation using Panel Fixed Effect Least Square and GMM estimations to control for possible endogeneity biases due to the presence of same control variables in both equations [Rao & Hassan (2009).] I used instrumental variables to control for

Table 1
Countries in the sample classified by region in 2013

| Americas | | Asia | Europe | MENA | Sub-Saharan Africa | | |
|---------------------------------|--------------------------|--------------------------|---------------------|----------------------|-------------------------|---------------------------|---------------------------|
| Bolivia ³ | El Salvador ³ | Bangladesh ⁴ | Cyprus ¹ | Algeria ² | Botswana ² | Mali ⁴ | South Africa ² |
| Brazil ² | Guatemala ³ | India ³ | Malta ¹ | Egypt ³ | Cameroon ³ | Mozambique ⁴ | Sudan ³ |
| Colombia ² | Honduras ³ | Pakistan ³ | | Tunisia ² | Kenya ⁴ | Rwanda ⁴ | Swaziland ³ |
| Costa Rica ³ | Panama ² | Philippines ³ | | Jordan ² | Lesotho ³ | Senegal ³ | Togo ⁴ |
| Dominican Republic ² | Mexico ² | Thailand ² | | Turkey ² | Madagascar ⁴ | Sierra Leone ⁴ | |

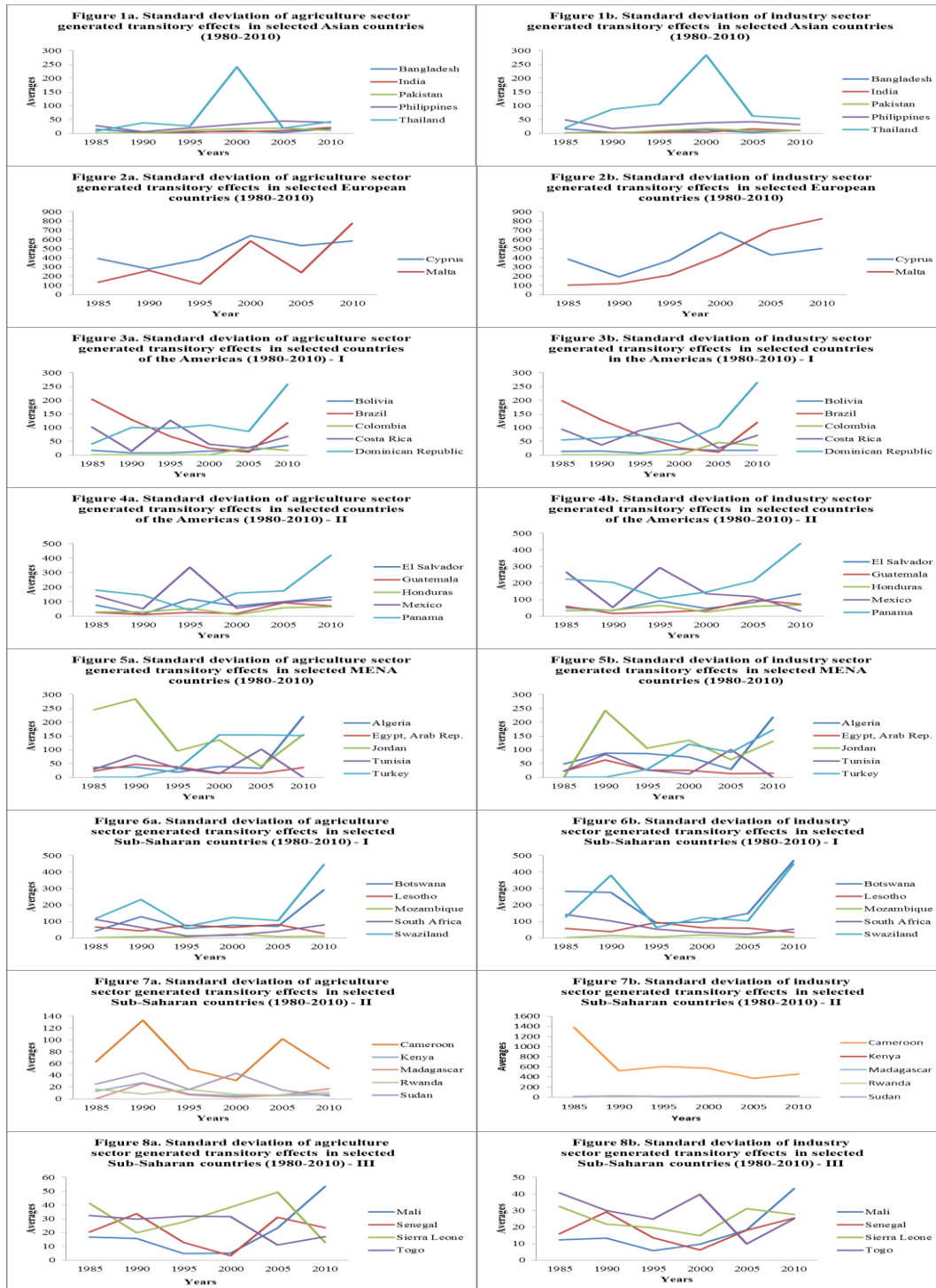
They were 2 high-income, 12 upper-middle-income, 14 lower-middle-income, and 8 lower-income countries to share 43.3% of the world remittance inflows. MENA =Middle East and North Africa. (1) =Higher-income; (2) =Upper- middle-income; (5) =Lower-middle-income; and (6) = Lower income. Source: World Bank Country and Lending Groups Classifications by Income 2013.

Table 2
Group Descriptive Statistics

| | Mean | Median | Max. | Min. | Std. | Skew. | Kurt. | Var. | Obs. |
|---------|-------|--------|-------|-------|-------|-------|-------|--------|------|
| CGDPC | 56.11 | 28.62 | 821.4 | -1199 | 201.6 | -1.91 | 19.57 | 359.3 | 134 |
| CREMGDP | -0.11 | -0.01 | 2.37 | -6.16 | 0.83 | -3.70 | 26.50 | -754.5 | 134 |
| FDEV | 46.8 | 34.15 | 253.6 | 2.69 | 47.02 | 2.67 | 10.93 | 100.4 | 134 |
| FDI | 3.52 | 2.60 | 32.42 | -3.62 | 3.88 | 3.62 | 25.13 | 110.2 | 134 |
| GDPG | 4.01 | 3.88 | 10.77 | -5.36 | 2.31 | -0.38 | 5.42 | 57.6 | 134 |
| GDPKG | 0.02 | 0.02 | 0.09 | -0.05 | 0.02 | -0.25 | 4.73 | 100.0 | 134 |
| GINI | 46.6 | 48.10 | 64.73 | 25.88 | 9.34 | -0.28 | 2.22 | 20.0 | 134 |
| OPEN | 0.77 | 0.68 | 2.04 | 0.09 | 0.44 | 0.68 | 2.84 | 57.1 | 134 |
| LOGGDP | 3.31 | 3.36 | 4.41 | 2.34 | 0.52 | 0.00 | 2.18 | 15.7 | 134 |
| REMGDP | 5.75 | 1.99 | 85.87 | 0.08 | 11.00 | 4.51 | 27.98 | 191.3 | 134 |

The statistics of the computed series of retained variables show coefficients of CREMGDP, CGDPC, and REMGDP to exhibit large dispersions.

Source: Author's estimations on WDI, Poverty and Equity, and IFS data.



Graphs 1a-8b show trends in transitory effects induced by remittance flows to have been most stable in industry sectors and, across regions, in Asia over 1980-2010.

Source: Author's estimations on World Development Indicators data.

possible heterogeneity biases that may arise from large dispersions in some of the series. Table 3 shows the GMM estimates of the growth equation. It shows the dependent variable performed best for the economies when measured as GDPG and for the agriculture and industry sectors when measured as CGDP. Though the financial development variable FDEV is strongly significant for the economies, composite transitory and financial sector development effects variables are globally non-significant and carry the negative sign. This result weakens suggestions, that financial development is inherent to the remittances-growth relation, conveyed by findings that remittances induce poverty reduction through financial development. Besides, FDEV is only significant with all measures of the dependent variable when estimated jointly with the transitory effects variable for the economies but only with CGDP when estimated jointly with the same variable for the industry sectors. It may be that, in the presence of remittances, financial development influences growth more in non-agriculture and non-industry sectors of the economy. The variable CREMGDP is systematically non-significant with dubious signs while REMGDP_2 is significant with CGDP and GDPKG when estimated jointly with the transitory effects variables for the economies and the agriculture sectors. This is an indication that the transmission of remittances' growth impact is rather a long-term process [Barajas & all (2016).] REMGDP is only significant with CGDP when estimated jointly with the transitory effects variable for the industry sectors. Coefficients of GINI index are mostly significant when estimated jointly with transitory effects variables for agriculture and industry sectors, a sign that growth generated in these two sectors may be unequally redistributed. LogGDP is systematically significant with all measures of the dependent variable and FDI systematically non-significant.

C.2. Deriving thresholds

Due to existing fixed effects in the annual data, I pooled it to re-estimate both growth and transitory effects equations, using Pooled Least Square and Two Stage Least Square estimation methods. I then derived values of the direct impact Γ and the indirect impact Φ for 26 countries due to marked irregularities in the other 12 countries' data series. They are group and individual threshold values for the 26 economies and their agriculture and industry sectors. As regression results vary with different measures of the growth equation's dependent variable, I introduced a second order

criterion for reaching the threshold level. The first one, in line with the theoretical framework, requires values of Φ to surpass those of Γ . The second one requires values of Φ and Γ to be derived from estimated coefficients of the growth equation regressed with GDPG as dependent variable for the economies and CGDP for their agriculture and industry sectors. On those bases, the 26 countries only reached their joint group's threshold points for their economies and agriculture sectors regardless of financial sectors' spillover effects. When assessed relatively to their reaching of individual and group's threshold points, four categories of countries emerge (Table 4). Countries in the first category reached neither their group's threshold nor their individual ones. Considering the economies, they are Dominican Republic and Madagascar with financial sectors' spillover effects but Brazil and Kenya without them. Cameroon, Mozambique, Sierra Leone, and Tunisia also reached none of the thresholds despites financial sectors' spillover effects. Countries in the second category reached their group's threshold but not their individual ones. Considering the economies, they are Bangladesh, Bolivia, Brazil, India, Mexico, and Turkey with financial sectors' spillover effects but Cyprus, Mozambique, Pakistan, South Africa, and Tunisia without them. Countries in the third category reached their individual thresholds but not their group's threshold. Considering the economies, they are Panama with financial sectors' spillover effects and Mexico without them. Countries in the fourth category reached their group's threshold and their individual ones. Considering the economies, they are Botswana, Colombia, Costa Rica, El Salvador, Honduras, Jordan, Lesotho, Senegal, and Swaziland regardless of financial sectors' spillover effects. Cyprus, Kenya, Pakistan, and South Africa also reached both types of threshold only with financial sectors' spillover effects but Cameroon and Sierra Leone without them. Considering the agriculture sectors, they are 8 countries in the first category, 18 in the second, 3 in the third and 6 in the fourth. Considering the industry sectors, they are 11 countries in the first category, 11 in the second, 5 in the third and 13 in the fourth.

VI. DISCUSSIONS AND CONCLUSION

My theoretical model structures the remittances-growth relation into three successive phases conditioned by a threshold effect. During the first phase, remittances serve altruistic purposes and exert a stronger short-term direct impact on output. They also exert an indirect but weaker impact on

output, through investments, which cumulates as transitory effects. During the second phase, the threshold point is reached or about to be reached with transitory effects starting to transmute into a sustainable growth. The process puts an upward pressure on the demands for goods and services, qualified jobs, and infrastructures. In turn, these trends require accommodating policies and effective institutions to escalate and sustain the emerging growth. During the third phase, beyond the threshold point, migrant workers' family-related financial burden lessened. Thus, they transfer freed resources from altruistic purposes towards investments opportunities, helping to sustain the trends.

I derived values of thresholds from regression estimates and found that a country's capacity to reap a remittances-induced growth is better assessed using its own individual threshold as criteria than a group's threshold. Group thresholds tend to capture size effects as Brazil, India, and Mexico's economies fell into the second category for being too large compared to the average group size. A similar conclusion is reached by Sayan (2016) that: "cross-country studies that produce empirical estimates referring to the average behavior may sometimes be misleading as they conceal possibly significant differences in the behavior of remittances received by individual countries." The transmission of the remittances-induced growth is found to be a long term process and independently determined between an economy and its agriculture and industry sectors. As evidence, growths generated by remittances have been comparatively more unequally distributed in these two sectors than in the economies. Finally, though financial development influences growth more, in the presence of remittance flows, in non-agriculture and non-industry sectors, it is not inherent to the remittances-growth relation, as conveyed in the literature.

Globally, these findings suggest that remittances-related policies and projects should necessarily account for the phase reached by the receiving country and its own remittances-induced growth threshold constraint effect. As they tend to be more altruistic at pre-threshold phases, policies should avoid diverging remittance flows towards non-household uses. Otherwise, they may undermine receiving countries' capacities to cope with crises and adversely affect households' welfare. Finally, non-accommodating the transmuting of remittances' transitory effects into growth may also act as ignoring their threshold constraint effect.

Table 3
GMM Estimates of the Growth Equation by sector

| | Whole economy | | | | | | Agriculture | | | | | | Industry | | | | | |
|--------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | GDPG | | GDPKG | | CGDPC | | GDPG | | GDPKG | | CGDPC | | GDPG | | GDPKG | | CGDPC | |
| C | -41.9 | -79.3 | -0.51 | -0.60 | -5631 | -6094 | 6.94 | -67.8 | -0.05 | -3723 | -1556 | -2946 | -15 | -57.5 | -0.17 | -0.17 | -2299 | -3363 |
| | -2.58 | -2.74 | -2.78 | -2.35 | -3.99 | -2.23 | 0.30 | -2.08 | -0.21 | -2.06 | -1.37 | -1.64 | -0.99 | -2.73 | -1.24 | -2.88 | -2.02 | -2.03 |
| CREMGDP | -1.64 | -0.41 | 0.00 | -0.01 | 8.21 | -171 | -0.08 | 0.43 | 0.01 | 113.0 | -4.75 | 66.71 | 0.14 | 0.36 | 0.01 | 0.00 | -45.09 | 83.70 |
| | -1.25 | -0.18 | 0.23 | -0.49 | 0.07 | -0.95 | -0.06 | 0.23 | 0.58 | 1.21 | -0.06 | 0.49 | 0.14 | 0.29 | 0.86 | -0.31 | -0.48 | 1.07 |
| TRANSIT_1 | 0.00 | | 0.00 | | -0.07 | | 0.00 | | 0.00 | | 0.18 | | 0.00 | | 0.00 | | 0.20 | |
| | -0.10 | | -0.72 | | -0.71 | | 3.15 | | 2.86 | | 4.91 | | 2.18 | | 4.05 | | 5.05 | |
| TRANSFDEV_1 | | 0.00 | | 0.00 | | 0.00 | | | | | | | | | | | | |
| | | -1.03 | | -2.02 | | -0.95 | | | | | | | | | | | | |
| TRANSAFDEV_1 | | | | | | | 0.00 | | 0.00 | | 0.00 | | | | | | | |
| | | | | | | | 0.75 | | 5.07 | | 0.49 | | | | | | | |
| TRANSIFDEV_1 | | | | | | | | | | | | | 0.00 | | 0.00 | | 0.00 | |
| | | | | | | | | | | | | | 1.79 | | -0.09 | | 1.07 | |
| REMGDP_2 | 0.08 | 0.05 | 0.00 | 0.00 | 12.14 | -4.93 | 0.12 | 0.10 | 0.00 | 11.33 | 10.89 | 8.97 | 0.07 | 0.03 | 0.00 | 0.00 | 9.59 | 10.43 |
| | 1.25 | 0.24 | 2.13 | -0.44 | 2.01 | -0.31 | 1.83 | 0.62 | 2.25 | 1.53 | 2.56 | 0.80 | 1.23 | 0.29 | 0.59 | 0.29 | 2.10 | 1.46 |
| OPEN | -2.99 | -8.96 | 0.01 | -0.02 | -323.9 | -341.3 | 0.33 | -17.4 | 0.05 | -1124 | -347.7 | -963.2 | -0.98 | -10.3 | 0.01 | -0.04 | -500.7 | -957.4 |
| | -0.81 | -1.04 | 0.28 | -0.29 | -1.07 | -0.42 | 0.04 | -2.04 | 0.66 | -2.66 | -1.37 | -1.91 | -0.29 | -1.76 | 0.25 | -0.67 | -1.5 | -2.55 |
| FDEV | -0.08 | -0.12 | 0.00 | 0.00 | -12.94 | -12.9 | 0.05 | -0.06 | 0.00 | 4.18 | 0.19 | 2.16 | 0.00 | -0.02 | 0.00 | 0.00 | 0.52 | 2.80 |
| | -4.00 | -4.82 | -4.72 | -4.03 | -7.29 | -5.69 | 1.12 | -1.35 | 0.87 | 1.15 | 0.07 | 0.55 | -0.01 | -0.39 | 1.39 | -2.02 | 0.19 | 0.84 |
| FDI | 0.06 | -0.08 | 0.00 | 0.00 | 1.86 | 15.02 | 0.13 | -0.21 | 0.00 | -13.1 | 4.35 | 5.93 | 0.10 | -0.25 | 0.00 | 0.00 | 0.22 | 1.21 |
| | 0.53 | -0.32 | 1.19 | 0.97 | 0.18 | 0.63 | 1.26 | -0.93 | 1.65 | -0.96 | 0.60 | 0.40 | 1.00 | -1.46 | 1.42 | -0.10 | 0.03 | 0.08 |
| GINI_1 | -0.14 | 0.08 | 0.00 | 0.00 | -24.06 | 5.39 | -0.31 | 0.07 | 0.00 | 1.42 | -27.65 | -4.58 | -0.26 | 0.08 | 0.00 | 0.00 | -28.66 | -4.97 |
| | -1.04 | 0.39 | -1.75 | -0.77 | -2.03 | 0.29 | -1.89 | 0.31 | -2.05 | 0.10 | -2.87 | -0.34 | -2.05 | 0.57 | -1.93 | -0.26 | -2.67 | -0.40 |
| LOGGDP_1 | 17.4 | 27.8 | 0.22 | 0.23 | 2313 | 2033 | 2.53 | 25.5 | 0.05 | 1345 | 957.7 | 1171 | 10.27 | 20.18 | 0.09 | 0.22 | 1296 | 1312 |
| | 2.92 | 2.99 | 3.78 | 2.93 | 4.75 | 2.48 | 0.34 | 2.80 | 0.66 | 2.76 | 2.82 | 2.32 | 2.05 | 3.05 | 2.32 | 3.80 | 3.85 | 2.93 |
| R-squared | 0.40 | 0.62 | 0.36 | 0.62 | 0.37 | 0.56 | 0.40 | 0.52 | 0.42 | 0.74 | 0.66 | 0.75 | 0.52 | 0.68 | 0.59 | 0.68 | 0.61 | 0.75 |

Table 3
GMM Estimates of the Growth Equation by sector

| | Whole economy | | | | | | Agriculture | | | | | | Industry | | | | | |
|----------------------|---------------|------|-------|------|-------|------|-------------|------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|
| | GDPG | | GDPKG | | CGDPC | | GDPG | | GDPKG | | CGDPC | | GDPG | | GDPKG | | CGDPC | |
| Adj. R-square | 0.15 | 0.41 | 0.09 | 0.41 | 0.10 | 0.32 | 0.17 | 0.26 | 0.19 | 0.59 | 0.53 | 0.61 | 0.32 | 0.50 | 0.43 | 0.51 | 0.45 | 0.62 |
| Durbin-Watson | 2.08 | 2.54 | 1.76 | 2.82 | 1.35 | 1.71 | 2.30 | 2.35 | 1.91 | 1.96 | 1.74 | 1.81 | 2.34 | 2.78 | 2.17 | 2.70 | 1.73 | 1.85 |
| Instruments Rank | 44.0 | 37.0 | 43.0 | 39.0 | 44.00 | 39.0 | 43.0 | 40.0 | 44.0 | 43.00 | 44.00 | 41.00 | 46.00 | 41.00 | 46.0 | 41.00 | 45.00 | 44.00 |
| J-statistic | 13.4 | 19.5 | 5.29 | 25.5 | 13.76 | 18.4 | 13.0 | 25.8 | 14.4 | 20.23 | 24.24 | 20.36 | 23.59 | 18.99 | 23.8 | 20.47 | 16.99 | 21.69 |
| Prob. (J-statistics) | 0.04 | 0.00 | 0.38 | 0.00 | 0.03 | 0.01 | 0.04 | 0.00 | 0.05 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.02 | 0.03 |

Estimates from author's regression of the model on data obtained from the WDI, Poverty and Equity, and IFS databases.

Table 4
Group and individual threshold points reaching status

| Country | Whole economy | | | | Agriculture sector | | | | Industry sector | | | |
|--------------|---------------|-------|-----------|-------|--------------------|-------|------------|-------|-----------------|-------|------------|-------|
| | TRANSIT | | TRANSFDEV | | TRANSITA | | TRANSAFDEV | | TRANSITI | | TRANSIFDEV | |
| | Own | Group | Own | Group | Own | Group | Own | Group | Own | Group | Own | Group |
| Group | Yes | | Yes | | Yes | | Yes | | No | | No | |
| Bangladesh | No | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Bolivia | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | Yes | Yes |
| Botswana | Yes | Yes | Yes | Yes | No | No | Yes | No | Yes | Yes | Yes | No |
| Brazil | No | No | No | Yes | Yes | Yes | No | Yes | Yes | Yes | No | No |
| Cameroon | Yes | Yes | No | No | No | Yes | No | Yes | No | Yes | No | No |
| Colombia | Yes | Yes | Yes | Yes | No | Yes | No | No | No | Yes | No | No |
| Costa Rica | Yes | Yes | Yes | Yes | No | No | No | No | Yes | No | No | No |
| Cyprus | No | Yes | Yes | Yes | No | No | No | Yes | No | No | No | Yes |
| Dominican R. | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes |
| El Salvador | Yes | Yes | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes |
| Honduras | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | No | No |
| India | No | Yes | No | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes |
| Jordan | Yes | Yes | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No |
| Kenya | No | No | Yes | Yes | Yes | Yes | No | No | No | Yes | No | No |
| Lesotho | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Madagascar | No | No | No | No | No | Yes | No | Yes | Yes | Yes | No | No |
| Mexico | Yes | No | No | Yes | No | No | No | No | Yes | Yes | No | No |
| Mozambique | No | Yes | No | No | No | Yes | No | Yes | Yes | Yes | No | Yes |
| Pakistan | No | Yes | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes |
| Panama | Yes | Yes | Yes | No | No | No | No | Yes | No | No | Yes | Yes |
| Senegal | Yes | Yes | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes |
| Sierra Leone | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes |
| South Africa | No | Yes | Yes | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes |
| Swaziland | Yes | Yes | Yes | Yes | Yes | No | Yes | No | Yes | No | Yes | No |
| Tunisia | No | Yes | No | No | No | Yes | No | Yes | Yes | Yes | No | Yes |
| Turkey | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |

'Own' refers to a country's individual threshold and 'Group' the sample's threshold. 'Yes' and 'No' reflect whether a threshold is reached or not. On that basis, only 9 economies, 2 agriculture sectors, and 5 industry sectors reached all specified thresholds

Source: Author's estimations.

REFERENCES

1. Adams Jr, R. H. and Cuecuecha, A. (2010) Remittances, Household Expenditure and Investment in Guatemala, *World Development*, 38, pp. 1626-1641.
2. Abdih Y., Barajas A., Chami R., and Ebeke C. (2012) Remittances Channel and Fiscal Impact in the Middle East, North Africa, and Central Asia, *IMF Working Paper*, WP/12/104.
3. Agarwal, R. and Horowitz, A. W. (2002) Are International Remittances Altruism or Insurance? Evidence from Guyana Using Multiple-migrant Households, *World Development*, 30, pp. 2033-2044.
4. Aggarwal, R., Demirgüç-Kunt, A., Soledad, M., & Pería, M. (2010) Do remittances promote financial development? *Journal of Development Economics*, 96, pp. 255-264.
5. Anzoategui, D., Demirgüç-Kunt, A., Soledad, M., and Pería, M. (2014) Remittances and Financial Inclusion Evidence from El Salvador, *World Development*, 54, pp. 338-349.
6. Bang, J. T., Mitra, A, and Wunnava, P. V. (2015) Financial Liberalization and Remittances: Recent Longitudinal Panel Evidence, *The Journal of International Trade and Economic Development*, 24, pp. 1077-1102.
7. Barajas, A., Chami, R., Ebeke, C., and Oeking A. (2016) Transmission troubles: Heavy inflows of remittances impair a country's ability to conduct monetary policy, *Finance & Development*, 53(3).
8. Barajas, A, Chami, R., Fullenkamp, C., Gapen, M., and Montiel, P. (2009) Do Workers Remittances Promote Economic Growth? *IMF Working Paper*, WP/09/153.
9. Bettin, G., Lucchetti, R., and Zazzaro, A. (2011) Financial Development and Remittances: Micro-Econometric Evidence. *MoFiR Working Paper*, n° 56.
10. Bettin, G., Presbitero A. F., and Spatafora N. (2015) Remittances and Vulnerability in Developing Countries, *World Bank Economic Review*, 10.1093/wber/lhv053.
11. Brown, R. C., Carmignani, F., and Oxcarre, F. G. (2013) Migrants' Remittances and Financial Development: Macro- and Micro-Level Evidence of a Perverse Relationship, *The World Economy*, 36, pp. 636-660.

12. Combes, J-L. and Ebeke, C. (2011) Remittances and Household Consumption Instability in Developing Countries, *World Development*, 39, pp. 1076-1089.
13. Cooray, A. and Mallick, D. (2013) International business cycles and remittance flows, *The B.E. Journal of Macroeconomics*, 13, pp. 15-47.
14. Cox, A. and Ureta M. (2003) International Migration, Remittances, and Schooling: Evidence From El Salvador, *NBER Working Paper*, Number 9766.
15. Ebeke, C., Loko B., and Viseth A. (2014) Credit Quality in Developing Economies: Remittances to the Rescue? *IMF Working Paper*, WP/14/144.
16. Edwards, A. C. & Ureta, M. (2003) International migration remittances, and schooling: Evidence from El Salvador, *Journal of Development Economics*, 72 pp. 429-461.
17. El-Sakka, M. I. T. and McNabb, R. (1999) The Macroeconomic Determinants of Emigrant Remittances, *World Development*, 27, pp. 1493-1502.
18. Faini R. (1994). Workers remittances and the real exchange rate, *Journal of Population Economics*, 7, pp. 235-245.
19. Giuliano, P. and Ruiz-Arranz, M. (2009) Remittances, financial development, and growth, *Journal of Development Economics*, 90, pp. 144-152.
20. Gupta, S., Pattillo, C., and Wagh, S. (2009) Effect of Remittances on Poverty and Financial Development in Sub-Saharan Africa, *World Development*, 37, pp. 104-115.
21. Hanson, G. H. and Woodruff C. (2003) Emigration and Educational Attainment in Mexico, University of California at San Diego. *Mimeographed*.
22. Jansen W. D., Vacaflores E. D., and Naufal S. G. (2012) The Macroeconomic Consequences of Remittances, *International Scholarly Research Network (ISRN) Economics*, Volume 2012.
23. Jidoud A. (2015) Remittances and Macroeconomic Volatility in African Countries, *IMF Working Paper*, WP/15/49.
24. Lartey K. K. E., Mandelman S. F., and Acosta A. P. (2012) Remittances, Exchange Rate Regimes and the Dutch Disease: A Panel Data Analysis, *Review of International Economics*, 20, pp. 377-395.
25. Osili, U. O. (2007) Remittances and savings from international migration: Theory and evidence using a matched sample, *Journal of Development Economics*, 83, pp. 446-465.

26. Rao, B. and Hassan, G. (2009) Are the Direct and Indirect Growth Effects of Remittances Significant? *The World Economy*, 35, pp. 446-465.
27. Sayan, S. (2006) Business Cycles and Workers' Remittances: How Do Migrant Workers Respond to Cyclical Movements of GDP at Home? *IMF Working Paper*, WP/06/52.
28. Yang, D. (2008) International migration, remittances and household investment: Evidence from Philippine migrants' exchange rate shocks, *The Economic Journal*, 118, pp. 591-630.